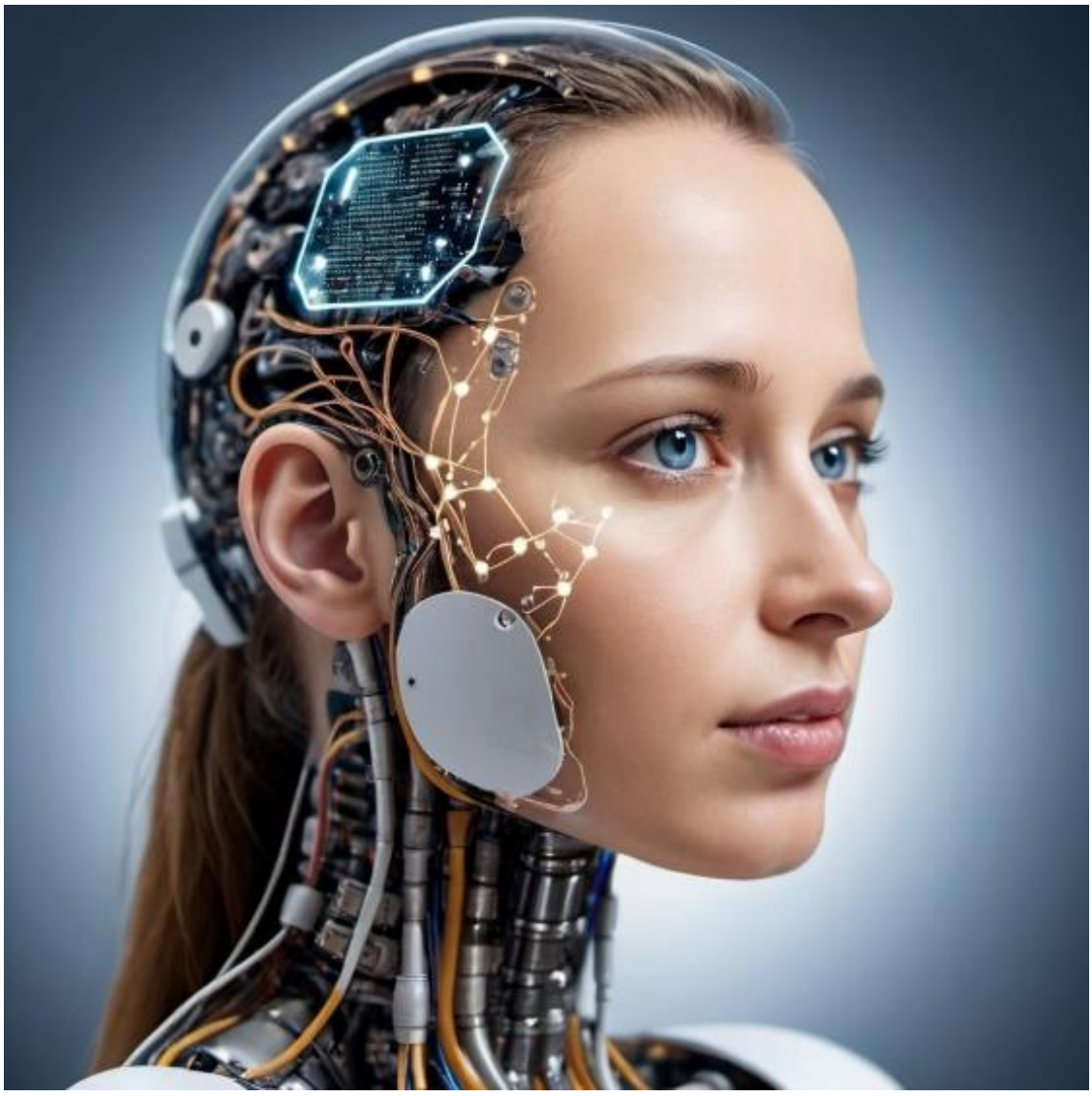
To my wife Gloria



Successful AI-enabled science, research, and innovation for a prosperous Europe

Breakthroughs, prospects, and outcomes for novel policy and philosophical insights

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In nova fert animus mutatas dicere formas corpora

The mind inclines to tell of forms changed into new bodies
(Ovidius Naso)

Ἄνθρωπος μέτρον

Man is the measure of all things
(Protagoras)

Foreword: AI vision, concepts, and challenges

In 1922, Ludwig Wittgestein pontified and discussed in his magnum opus *Tractacus Logico-Philosophicus* how far and to what extent "the limits of my language are the limits of my world". Artificial Intelligence (AI) is an unprecedented frontier of language, imbuing, inspiring and permeating science, research, and technology, pervasively and ubiquitously impacting on economy, industry, society, sustainability, politics, and culture. Thanks to its unparalleled potentialities, AI tantalizes human imagination, projections, hopes, fears, uchronic as well utopic expectations.

This ultimately requires novel policy lookouts, insights, and foresights, as well as pioneering philosophical discernments, aimed at nurturing innovative governance models. In fact, AI deals with an unparalleled moving frontline across science, research, and technology, involving, depicting, and anticipating known, unknown, and unpredictable potentialities and challenges.

In this light, most challenges currently stemming from progress in science, research and technology are evoking, instilling, and inspiring novel and far-reaching AI designs, developments, and achievements: however, their advances, forethoughts, insights, and foresights are vowed to stimulate, infuse, and fuel novel potentialities back into science, research, and technological innovation.

This leads to AI integration, uptake, and embedment into science, research, and technology at diverse layers: multidisciplinary, enabling different disciplines to work together, each drawing on their disciplinary knowledge; interdisciplinary, by facilitating the assimilation of knowledge and methods from diverse disciplines into a synthesis approach; transdisciplinary, by intelligizing the unison of both conceptual and intellectual frameworks beyond disciplinary approaches and perspectives.

On the one hand, by radically augmenting, expanding, and empowering science, research, and technology performance, efficiency and accuracy, AI enhances their outputs, upshots, and outcomes. On the other hand, AI empowerments could accomplish mirroring, mimicking, and finally altering almost all representations, depictions, behaviors, and symbols of human realities, either perceived or concrete, thus ultimately affecting and jeopardizing their credibility and trustworthiness.

Doing so, AI could manage to reshape, steer, and manipulate most human faculties and prerogatives such as perceiving, feeling, thinking, believing, choosing, deciding, and acting. Therefore, AI could succeed to profoundly affect and impinge on the core of human identity, self, and nature, managing to subdue, bundle, sway and maneuver their hypostases and emanations as well.

Clearly, conceiving, creating, and developing innovative and ground-breaking digital literacy models on AI for education are consequentially needed, dedicated to discriminating between AI-generated and human-created contents, henceforth demystifying AI-engendered faked, falsified, and counterfeited contents.

Therefore, designing novel, consequential, and far-reaching policy lookouts, insight, and foresights – as well as innovative and ground-breaking philosophical discernments – are essential to design innovative governance patterns: these should enable mankind to fully benefit from the undeniable AI-powered rewards, simultaneously mitigating, masterminding, and governing its potentially devastating downsides and snags.

An honest, perspicuous, and introspective conceptual reflection on the notion of *intelligence* shall complete the picture: it deepens the comprehension of its authentic meaning, scope, and settings, as its etymon stems from the Latin "*intus legere*", i.e., inwardly reading. So, reading inwardly AI itself relativizes its enthralling prospects, alluring beliefs, and enticing mindsets.

Therefore, responsibly intelligizing a holistic and lucid assessment of both potentials and perils of AI enables portraying its most cogent mindset. That is to empower man without enhancing nor substituting what is intrinsically and inherently human: conscience, self-awareness, feelings, emotions, intellect, metaphysical thought, discernment: these typifying human faculties and prerogatives structure, imbue, and root for responsibility, enabling it to exert and wield the free will.

In this light, Immanuel Kant's archetypical paradigm is particularly revealing, edifying, and inspiring: "the starry heavens above me and the moral law within me*"*.

Table of Contents

Introduction

In order to think ever bigger, you have to go ever smaller: today's science research and innovation are looking for the key to greater achievements by turning its full attention to the Artificial Intelligence (AI). The most conventionally accepted, extensively interpreted, and widely used terminology defines AI as a set of tools, technologies, and systems designed to simulate human intelligence by imitating, mimicking, and mirroring its processes by using complex systems such as machine and deep learning algorithms, natural language processing, and robotics[1].

In this light, the author prefers an alternative definition, stemming from a composed wording intermingling the concepts of logics and intelligence, synthesizing the aggregated etymon "**artificial logics Assisting Intelligence (AI)**". Doing so, its philosophical, etymological, critical conceptual construal sounds fully robustly and more appropriately defined. In fact, AI is presented as a set of artificial logics vowed to assist, support, augment, and multiply science, research, and technology outputs: it is therefore dedicated to aid, guide, support, and empower human intelligence, whereas neither substituting nor enhancing it.

Becoming ubiquitous and pervasive, AI is getting across from smaller to upper layers of science, technology, innovation, and knowledge at large. However, this new cognitive paradigm revolution implies the mastery of an intricate web of interdisciplinary connections, as demonstrated throughout the sets of EC-funded research projects addressed, described, analyzed, and assessed in this book.

In fact, AI is the new moving frontier of science and technology, both in Europe and around the world, working at the ubiquitous scale in a pervasive manner. Top scientists as well as policymakers worldwide praise the benefits it would bring to the entire society, economy, industry, sustainability, politics, and even culture. Most of them insist on the key role research would play in the value-creation process to develop exploitable portfolios of sciences, research and technologies leading to a choice of unique applications, products, markets, and profitable revenue sources.

Additionally, AI is already becoming ever more deeply embedded in today's life: so, it is a critical moment for communicating the huge public effort that has been put into European research, its major outcomes, and new directions: both current and potential AI-powered science breakthroughs, research prospects, and innovation outcomes, as well as their related opportunities and drawbacks for and in the entire society at large need to be properly explored and elucidated.

[1] Russel, Stuart J; Norvig, Peter (2016). *Artificial Intelligences: a modern approach*. Pearson, ISBN 978-1-292-15396-4, OCLC 1029506845.

Clearly, this task cannot be left solely to scientists or technology suppliers. Dealing with new frontiers of science, research, and technology calls for properly address and explain both the advantages and risks. In fact, AI-enabled science research and technology takes a very special place in the EU: developing information and communication, as well as engaging into societal dialogue and debate on AI research have already become an essential part of many European policy initiatives. So, communicating AI-powered science, research and innovation is becoming critical for both Europe and European institutions: consequently, selecting and structuring the relevant information to reach key audiences is crucial for attaining responsible governance in the EU.

In this light, setting up appropriate methodologies to display this information on AI-powered science, research, and innovation is becoming the ultimate and most challenging step at EU level. This exercise has enabled identifying how information on EC-funded AI-related research can and should be effectively collected, structured, and presented to be further communicated to relevant EU audiences.

Meaningful analysis, assessment, and communication of AI-related outcomes in EC-funded projects is especially needed, as lay public can become somehow skeptical and less deferential about AI. This is the reason why creating a relationship and a communication exchange between stakeholders is regarded as being essential.

The present book is a true 'first': whereas communicating AI-related European research projects and their ultimate outcomes impacting onto industry, society, politics, and culture is a moral duty, communicating them well is a moral responsibility. We hope to have contributed to fulfilling this challenge sufficiently well, so that others may be inspired to pick it up.

Materials and methods: aim, objectives, methodology, results and expected impacts

The aim of this book is to address, illustrate and evaluate successful AI-enabled science, research, and technology projects in Europe, drawing a specific focus on selected outstanding sets. Its objectives are multiple, i.e., to identify, assess and discuss: (i) innovation outcomes; (ii) science breakthroughs; and (iii) research prospects, vowed to ultimately contribute to (iv) EU policy lookouts, insights, and foresights, as well as to framing novel (v) philosophical discernments.

For doing this, the following step-by-step progressive methodological approach has been carried out.

- First, over one hundred thousand AI-related non-repeated entries in projects' title, acronyms, abstract, summaries, materials and methods, narratives, deliverables, milestones, analysis, discussion, periodic reports, and conclusions have been sorted out: these have been pooled from EC databases (e.g., CORDIS), and from signed EC projects funded under all schemes over the last twenty-five years, Horizon Europe, H2020, ERC, FP7, FP6, and FP5. Their analysis is targeted to identify outputs, upshots, and outcomes, therefore vowed to inspire novel policy and philosophical lookouts, insights, and foresights.
- Second, this investigation phase has allowed to funnel the identification onto **a set of 650 AI-powered successful projects**: here, in addition to the previously illustrated AI citations, AI quotations are also specifically spotted in most prominent key projects' outcomes, i.e., (i) publications; (ii) IPR and patents; (iii) protocols – e.g., production, application, clinical; (iv) and prototypes. This set has been mined thru and across all EC funding schemes by using specific data mining tools, e.g., CORTEX and QLIK.
- Third, this enabled to group these projects in the following clusters, displayed in Annexes I to V: (i) AI-enabled Industrial Technologies and Manufacture; (ii) AI-enabled Augmented Medicine and Healthcare; (iii) AI-enabled Sustainable Environmental and Energy; (iv) AI-enabled ICT, Mobility and Security; (v) AI-enabled Ethical, Legal and Social disciplines.
- Fourth, this approach enabled to attain a further refinement step: funneling the analysis, a more distilled projects array stemming from the previous set of successful projects has been identified, i.e., **a subset of 86 AI-powered outstanding projects**, where AI plays a crucial and a dazzlingly performing role at various project layers, i.e., aim, objectives, challenge, content, mission, expected results, outputs, upshots and outcomes. The operational discriminant which allowed this last selection is the particularly outstanding impact AI performed therein in terms of number and quality

of: (i) publications; (ii) IPR and patents; (iii) protocols – e.g., production, application, clinical; (iv) and prototypes.

In this light, to identify, explore and evaluate their impacts, these outstanding projects have therefore been grouped under the same cluster categories, and displayed in Annexes from VI to X. This enabled to carrying out a first step of the discussion, i.e., **quantitative analysis,** vowed to quantitatively evaluate, discuss, and assess the subset **of 86 outstanding AI-powered projects and their submitted proposals**: this has been carried out at both aggregated and cluster-specific levels. Both were dedicated to identifying, analyzing, and assessing selected lookouts, insights, and foresights from their expected impacts onto economy, industry, society, culture, and politics at large, in the EU and beyond. This enabled to illustrate, analyze, and assess their overall distribution into dominant topics, impact fields, scientific and technological domains, referenced wordings areas, funding schemes, geographical granting, performance outputs, key drivers for their outstanding success.

Then a second step of the discussion has been carried out i.e., **qualitative analysis,** vowed to qualitatively evaluate, discuss, and assess **both sets of 650 successful and 86 AI-powered outstanding projects**: their scientific excellence, research perspectives and technological achievements have been identified, evaluated, and discussed in terms of: (a) innovation outcomes, (b) science breakthrough, and (c) research prospects.

Both steps of the discussion have led to evict, outline, and provide both novel policy and philosophical lookouts, insights, and foresights: their outlines, analysis and assessment enabled to tackle, examine, and scrutinize the most crucial drawbacks AI could trigger in terms of privacy, security, ethics and democracy, whose impacts AI itself could attempt to mitigate by responsibly designing, developing, and implementing adaptive and mitigating solutions.

This has enabled to discuss a vast panoply of AI-scienced policy lookout, insights, and foresights, as well as novel philosophical discernments: all this is vowed to optimally exploit the undeniable advantages AI can enable in terms of raising efficiency, accuracy and performance of science, research and technology in society, economy, industry, culture, and politics, whilst simultaneously mitigating its potentially devastating drawbacks for humankind.

As a final theoretical and metaphysical impact, this discussion has opened the floor to evict and disembowel a set of relevant considerations rooting for the discussion about the etymon “artificial intelligence” itself, which has been conceptually, philosophically, and critically analyzed. The author has proposed and discussed the term "**artificial logics Assisting Intelligence (AI)**” as a more suitable conceptual construal to define the conventionally used term “Artificial

Intelligence": in fact, AI is essentially vowed to assist, guide, and empower human intelligence, whilst neither substituting nor enhancing it. In this light, crucial AI-related ethical principles are discussed, especially focusing on generative AI systems, glossed by some scholars as "moral machines": this requires special attention to avoid dehumanization of most AI-enabled achievements and of the whole concept of intelligence.

Last, conceptualizing the '**responsible-by-design'** AI construal has been presented as a set of concepts pursuing human-centric objectives whereas circumventing the 'black-box' issue. In fact, the discussion on the most promising science breakthroughs, cutting-edge research prospects, and ground-breaking innovation outcomes of responsible-by-design AI aims at outlining far-sighted policies in Europe and beyond. These are vowed to nurture the responsible embedment of AI to advance in science, research, and technological innovation in the EU, simultaneously attaining responsible knowledge management and sustainable prosperity, both in Europe and beyond.

Summarizing, AI is showed as the novel, ubiquitous, and pervasive moving frontier in science, research, technological innovation, industry, society, politics, and culture at large, both in EU and beyond. Due to its overwhelming current and prospective potentialities, this book demonstrates to what extent AI could responsibly empower humans, although it should neither substitute nor enhance them: this is the sole moral, ethical and sustainable way for benefitting from the enormous promises AI is outlining to advance in responsible knowledge management and prosperity in Europe and beyond.

Materials and methods: aggregated and cluster specific levels

Overall, the first step of the methodology mines data from diverse EC databases (e.g., CORDIS) pooled from signed EC projects funded under all schemes over the last twenty-five years, since the Fifth Framework Programme to nowadays. Their critical analysis aims at sorting out more than one hundred thousand AI-related non-repeated entries in projects' title, acronyms, abstract, summaries, materials and methods, narratives, deliverables, milestones, analysis, discussion, periodic reports, and conclusions.

The following methodological investigation phase has allowed funneling down the analysis towards the identification of a set of 650 successful AI-powered projects: this set has been mined thru and across all EC funding schemes by using specific data mining tools, e.g., CORTEX and QLIK. Herein, in addition to the previously illustrated AI citations, AI is also specifically quoted in key projects' outcomes, i.e., publications, IPR and patents, protocols, and prototypes.

This enabled a further focusing of the methodology, i.e., grouping these 650 **successful AI-powered projects** in the five clusters, which have been pooled and synthetically displayed in Annexes I to V, where their basics are collected, addressed, and illustrated:

I. 51 projects in AI-enabled Industrial Technologies and Manufacture.
II. 221 projects in AI-enabled Augmented Medicine and Healthcare, more in detail, its main branches have been addressed: Diagnostics, Theragnostics, Targeted Drug-Delivery and Regenerative Medicine.
III. 83 projects in AI-enabled Sustainable Environment and Energy.
IV. 205 projects in AI-enabled ICT, Mobility and Security.
V. 90 projects in AI-enabled Ethical, Legal and Social disciplines.

Therefore, this approach enabled to attain a further refinement of the research, by funneling the analysis onto a more distilled subset of 86 outstanding AI-powered projects, where AI plays a crucial and outstanding role at various project layers, i.e., aim, objectives, challenge, content, mission, expected results, outputs, upshots and outcomes. Their operational and enabling discriminant is the particularly striking and outstanding impact AI performs therein in terms of number and quality of: i.e., (i) publications; (ii) IPR and patents; (iii) protocols – e.g., production, application, clinical; (iv) and prototypes.

At aggregated level, both analysis and discussion of the bulk of proposals leading to retain a subset pooling 86 outstanding AI-powered projects have been carried out, to identify key drivers leading to their success. Then, the pool gathering 86 outstanding AI-powered projects has been analyzed and discussed at aggregated

level as well, to evict and illustrate common features and key drivers for projects success.

This step enabled to huddle five clusters populated with the bulk of 86 outstanding AI-powered projects, thus leading to both analysis and discussion at cluster level: here their main science breakthroughs, research prospects and innovation outcomes were addressed.

These clusters pooling 86 **outstanding AI-powered projects** are fully and extensively displayed in Annexes VI to X, therein collecting, assembling, and illustrating the essentials of:

VI. 22 projects in AI-enabled Industrial Technologies and Manufacture.
VII. 21 projects in AI-enabled Augmented Medicine and Healthcare, more in detail, its main branches have been addressed: Diagnostics, Theragnostics, Targeted Drug-Delivery and Regenerative Medicine.
VIII. 9 projects in AI-enabled Sustainable Environment and Energy.
IX. 20 projects in AI-enabled ICT, Mobility and Security.
X. 14 projects in AI-enabled Ethical, Legal and Social disciplines.

This discussion and the related considerations enabled to outline novel AI-relevant policy lookouts, insights, and foresights leading to ground-breaking innovative governance patterns, as well as to deepen the focus into their related pioneering philosophical discernments accordingly.

Discussion: outstanding AI-enabled projects and proposals at aggregated level

The quantitative analysis, assessment, and discussion have been carried out at aggregated level on the bulk of submitted proposals leading to retain a set of 86 outstanding AI-powered projects, to identify key drivers heading towards their submission success. Similarly, the quantitative analysis, assessment and discussion of the pool gathering 86 outstanding AI-powered projects are addressed at aggregated level: they are dedicated to evicting and illustrating common features and key drivers leading to projects outstanding success, measured in terms of achieved cutting-edge innovation outcomes, which are ultimately driven by their science breakthrough and research prospects.

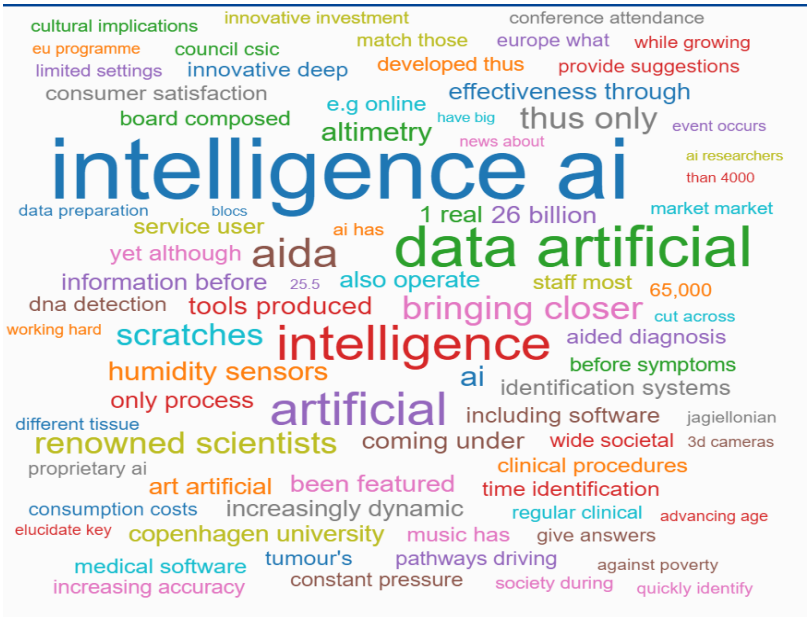
So, both the submitted proposals and their resulting associated 86 retained outstanding projects are analyzed and assessed thru data mining tools, i.e., initially CORTEX and subsequently QLIK.

First, the overall proposals' analysis and evaluation dedicated to illustrating and assessing their: (i) centers of gravity of the most significant terms; (ii) distribution by topic; (iii) distribution by impacting fields; (iv) submission timeline; (v) distribution by thematic priority and success rates; (vi) geographical distribution by EU contribution.

Second, the overall outstanding projects' analysis, discussion, and assessment aim at addressing, illustrate and evaluate their: (i) centers of gravity of the most significant terms; (ii) evolution over time and funding program; (iii) geographical distribution of net EU contribution by participation; (iv) overview of participating organization types and top SMEs; (v) overview of eligible EU contribution by top programs; (vi) projects innovation outcomes – stemming from science breakthroughs and research prospects –, which are altogether assessed in terms of: (vii) publications, as: topic subjects and categories; (viii) IPR and patents, as: exploitation and dissemination, types, and activities; (ix) protocols, as production, application, clinical; (x) prototypes.

Outstanding AI-enabled project proposals: aggregated level

The analysis of the most significant terms shows selected centers of gravity around some, which are overwhelming others, e.g., intelligence AI, data and artificial. This inspires to develop a more profound analysis of the term "artificial intelligence" itself, opening the floor to a quite articulated discussion, addressed in the final sections of this book.



Centers of gravity of most significant terms used in submitted proposals.

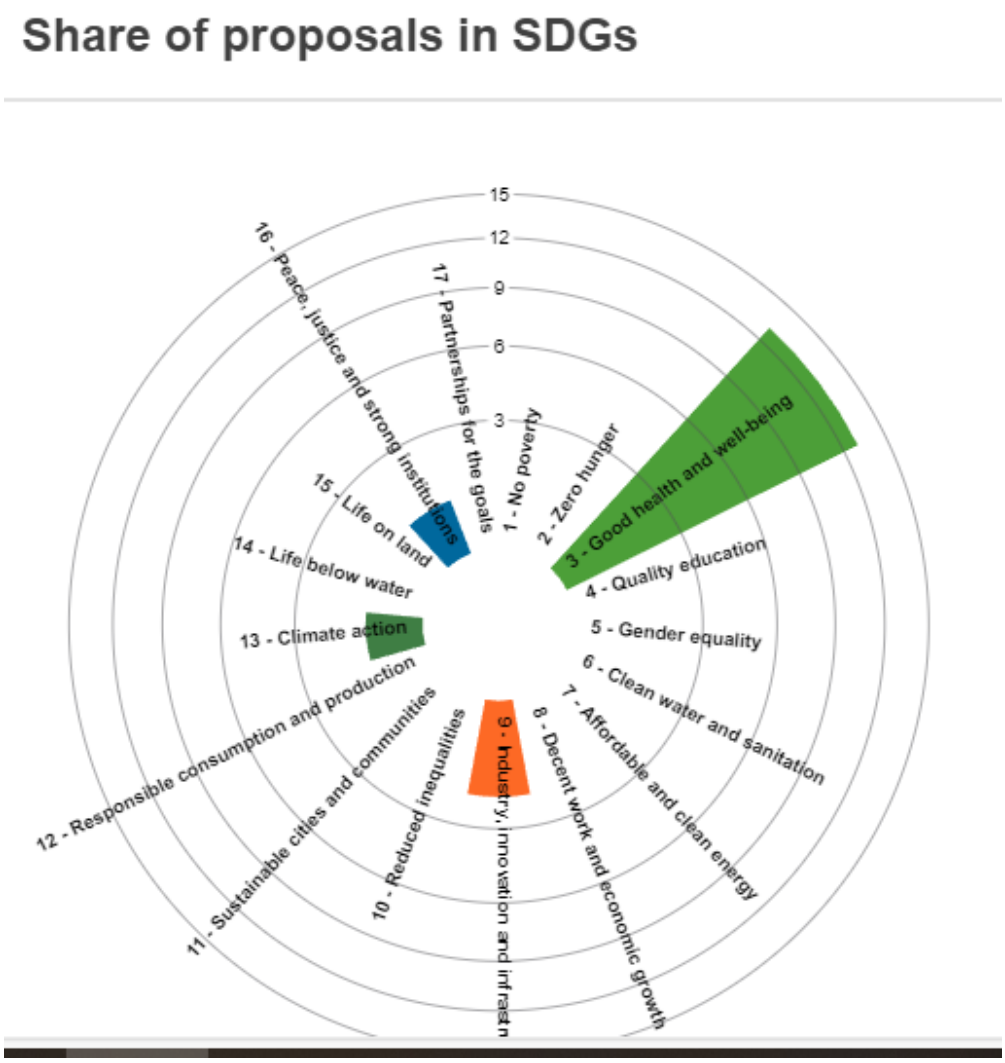
Analogously, the study of the aggregated data of submitted proposals enables to spotlight diverse outputs in terms of topic modelling by setting up 35 number of terms, and 15 number of topics, whose representation is enclosed below. Various topics are dominant, e.g., AI, artificial, liability, confidential proprietary, cybercrime, terrorist.

Topic distribution in submitted proposals.

Also, a sectoral representation of the impacting fields outlined by proposals is provided below, showing that ‘’Good health and well-being’’, together with ‘’Industry, innovation, and infrastructure’’ take the lion’s share, while ‘’Action for climate’’ and ‘’Peace, justice, and strong institutions’’ are altogether sufficiently well represented. This fits almost well with the overall consideration confirming that the most promising AI-enabled sciences fall in clusters: (i) AI-

enabled augmented Medicine and Healthcare; (ii) AI-enabled Industrial Technologies and Manufacture, and (iii) AI-enabled ICT, Mobility and Security. However, also the following clusters show some relevant impacts, i.e. (iii) AI-enabled Sustainable Environment and Energy and (iv) AI-enabled Ethical, Legal and Social disciplines.

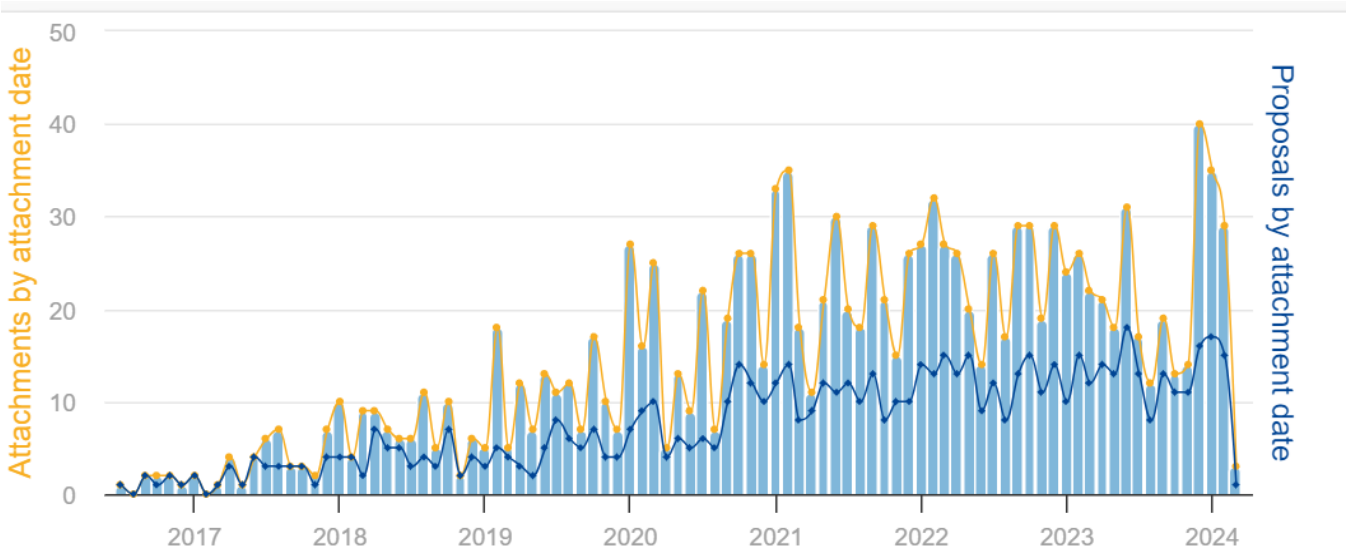
In this light, it is possible to evict to what extent the cluster "AI-enabled Augmented Medicine and Healthcare takes the lion's share in both numerical and funding terms respect to the others, whose populations are about one third smaller each. This will encourage to deepen that analytical approach at cluster level therein.



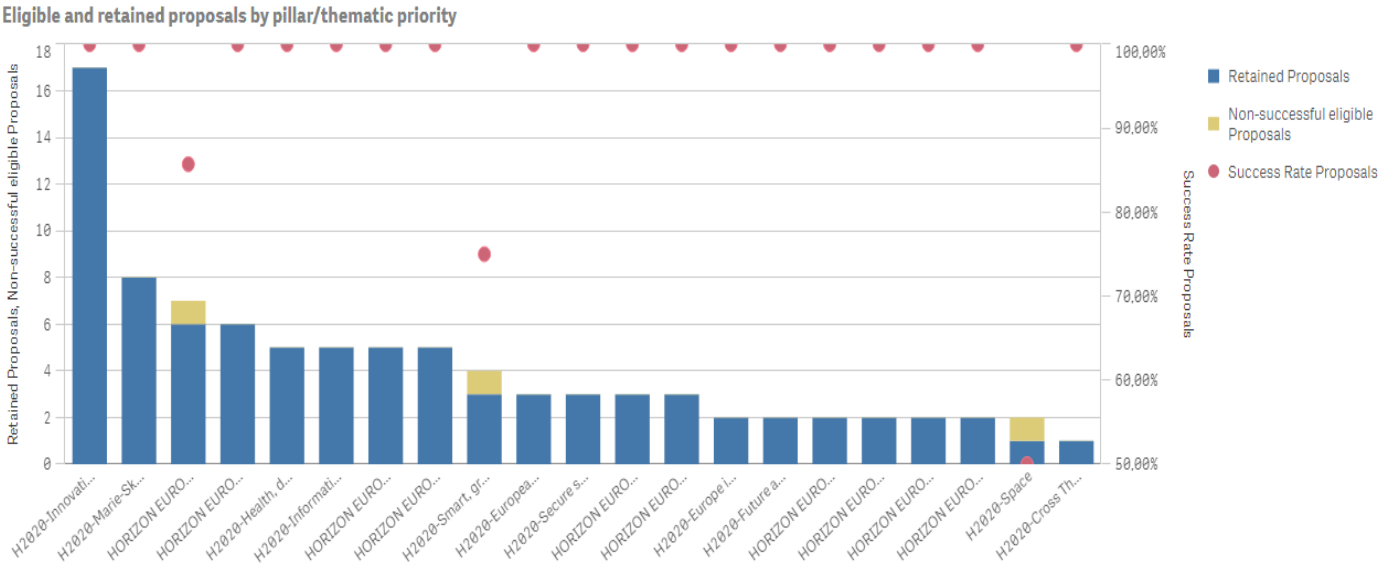
Distribution by impacting fields.

Last, it is possible to evict that the largest share of the analyzed proposals is submitted under H2020, while a less populated share is funded under ERC, FP7, FP6, FP5 and Horizon Europe: this seems reasonable due to the timing and

duration of the considered funding schemes. The timeline illustrating the submission of both proposals and their related attachments shows a progressive and constantly increasing trend in submission rate from the year 2020, with punctuated peaks in attachments submission recognizable in the years 2021, 2022, 2023, and 2024. Additionally, the figures illustrating both submitted and eligible proposals by thematic area are provided, indicating H2020 as the most targeted scheme, also characterized by a quite high success rate, which echoes that characterizing most funding schemes.

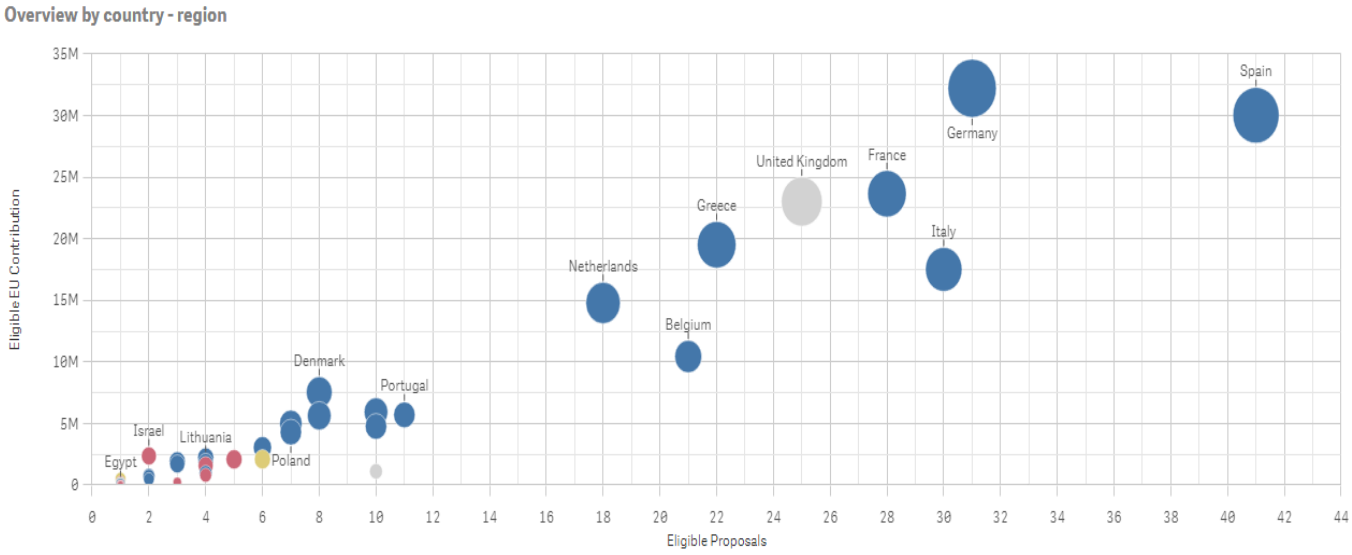


Submission timeline of proposals and their attachments.



Distribution of eligible and retained proposals by thematic priority, and their success rate.

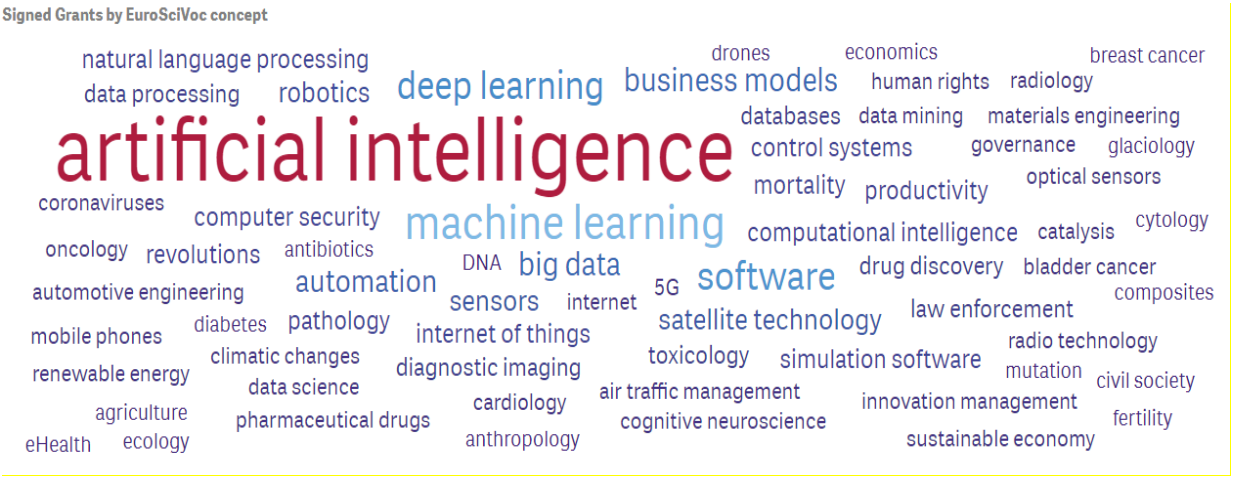
This enables to focus on the overview of the geographical distribution of eligible proposals by EU contribution, where proposals from Spain, Germany, Italy, France, and UK dominate in the upper right corner of the graph.



Overview of the geographical distribution of eligible proposals by EU contribution.

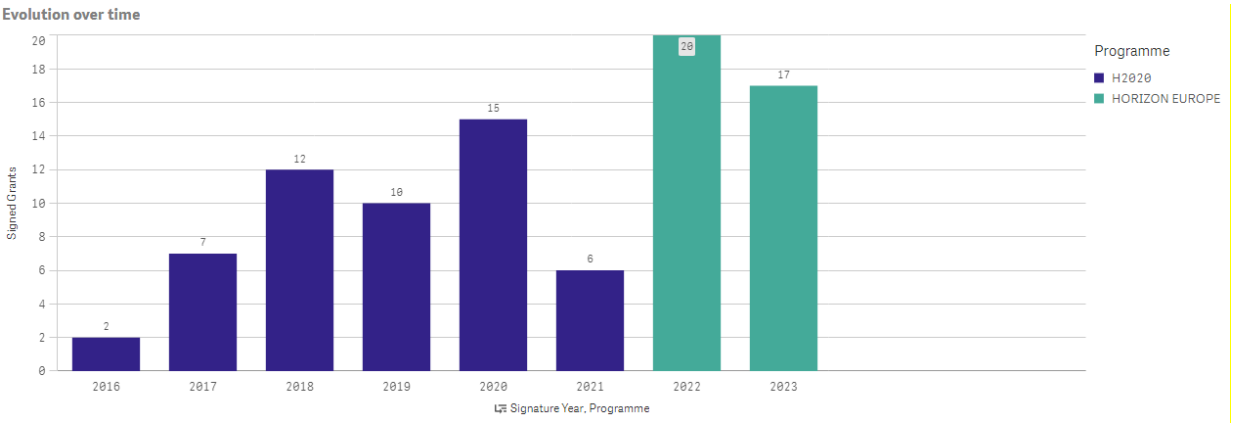
Outstanding AI-enabled projects: aggregated level

Here the analysis of the most significant terms clearly identifies some aggregation onto selected centers of gravity, which are dominating, e.g., Artificial Intelligence, Machine Learning, Deep Learning, Big Data, Business Models. This evokes that novel man-machine interaction patterns and machine learning models are key in outstanding AI-powered projects.



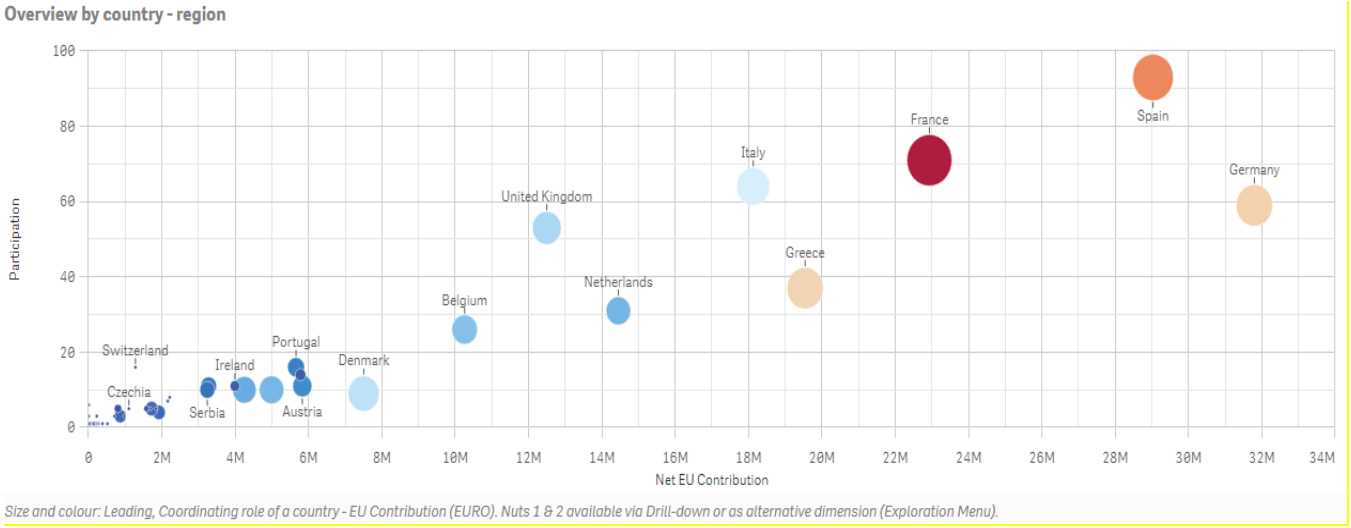
Centers of gravity of most significant terms used in outstanding AI-powered proposals.

At a further level, the analysis shows to what extent EU outstanding AI-powered projects are signed under EU programs, spotting and comparing the two dominant funding programs: their largest share falls under H2020, while a slightly less populated share is funded under Horizon Europe, whereas the rest is marginally funded under other schemes. This seems reasonable due to the timing and duration of the addressed funding schemes. The evolution of retained projects over time and funding programs illustrates a progressive and constantly increasing trend in submission rate from 2018, with peaks in 2020, 2022 and 2023.



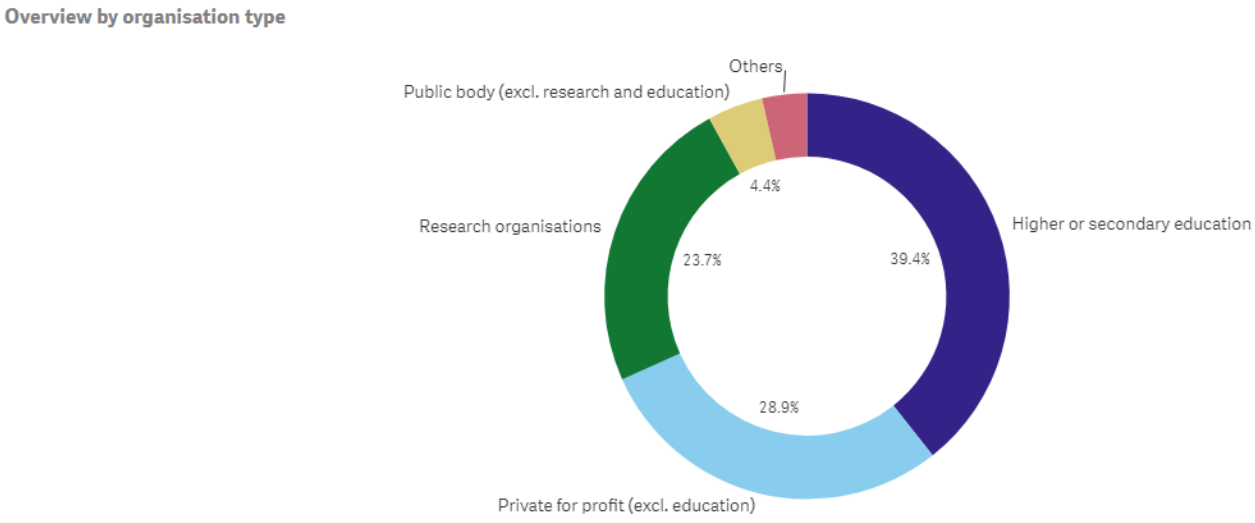
Evolution over time and program of retained outstanding AI-powered projects.

This leads to focus the analysis at country level, identifying an overview of the geographical distribution of net EU contribution to retained outstanding AI-powered projects by participation: Germany, Spain, and France dominate, followed by Greece and Italy, altogether populating the upper corner of the graph; after them The Netherlands, UK, and Belgium occupy an intermediate positions.



Geographical distribution of net EU contribution to retained projects by participation.

Additionally, the analysis has been drawn to identify the dominant categories of beneficiaries: the lion's share goes to academia, accounting for something less than half, followed by research centers and private companies, around one fourth each, whose top SMEs share takes one fifth: all these categories account altogether for 92% of the overall bulk of beneficiaries. Last, top funding programs are compared, showing that H2020 accounted for slightly more than a half of the overall funding bulk of 235M€ of eligible EU contribution, while Horizon Europe accounts for slightly less than a half.

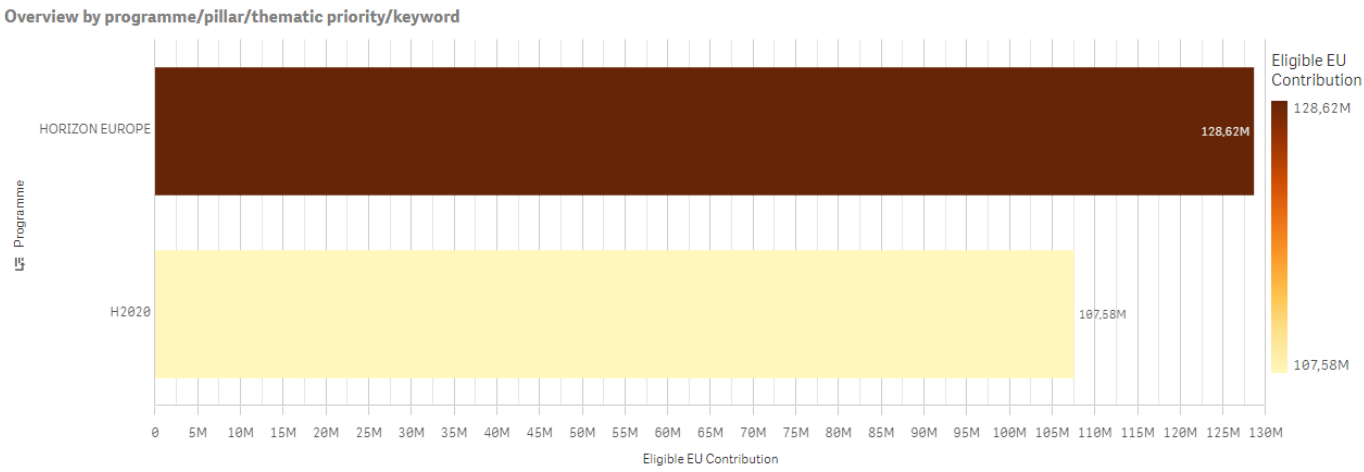


Overview of beneficiaries' organization types.

Top SME applicants

Legal Name	PIC	Country Name	City	Eligible SME Applications	Eligible SME EU Contribution
Total				**128**	**€ 45.448.489**
OCULAVIS GMBH	916491988	Germany	Aachen	1	€ 2.499.219
Neuro Event Labs Oy	904943750	Finland	Tampere	1	€ 1.881.250
Cobiro ApS	915355342	Denmark	Copenhagen K	1	€ 1.730.138
CECS	897294136	France	Corbeil-Essonnes	1	€ 1.665.500
DECIPHEX LIMITED	912236016	Ireland	Mornington Meath	1	€ 1.646.750
Meetsies SA	916555135	Belgium	Bruxelles / Brussel	1	€ 1.568.125
Corti ApS	911858977	Denmark	Copenhagen N	1	€ 1.439.183
Ecolyte GmbH	885401063	Austria	Graz	1	€ 1.241.456
STRA LDA	924784227	Portugal	Coimbra	1	€ 1.100.417
esqLABS GmbH	898464150	Germany	Saterland	1	€ 1.045.250
FASTCOMPCHEM, LDA	898313703	Portugal	Covilhã	1	€ 1.011.334
MOLECULAR NETWORKS GMBH COMPUTERCHEMIE	998047066	Germany	Nurnberg	1	€ 921.100
Samsara Therapeutics Ltd	895145004	United Kingdom	Headington	1	€ 847.500

Private organizations as beneficiaries: top SMEs.



Overview of eligible EU contribution by top funding programs.

Then, the research moves towards assessing **projects innovation outcomes**, i.e., (i) publications; (ii) IPR and patents, (iii) protocols – e.g., production, application, clinical; (iv) prototypes.

- First, both top publication subjects and their main categories are assessed: healthcare sciences (i.e., medicine, genetics, biology, neuro) account altogether for slightly less than a half of the overall volume, likely exact sciences, whereas social science remains somewhat marginal. Last, a further assessment shows that peer-reviewed high impact publications dominantly impact on Industrial Leadership and Societal challenges, accounting altogether for 85% of the totality.
- Second, the analysis shows that half of the projects exploitation results are significant in terms of IPR and patents, and that slightly less than a half are likely to be: this is reasonable indeed, as the analyzed 86 projects have been assessed as outstanding, sorting them out from the overall bulk of successful 650 projects.

- Third, the protocols of production, application and clinical are assessed: overall, the degree of innovation provided accounts for one fourth in novel production processes protocols; around one third stems from application protocols of novel methodologies and tests, whereas clinical protocols alone account for one tenth, being those protocols essentially related to clinical trials.
- Fourth, prototypes as innovative products take the dominant share of the global outcomes, accounting altogether for less than half of the overall amount of innovation outcomes.

Top Publication Subjects

Publication Subject	Peer-Reviewed Publications
2700 - Medicine	57
1300 - Biochemistry, Genetics and Molecular Biology	46
1700 - Computer Science	44
2200 - Engineering	42
Medicine	33
3100 - Physics and Astronomy	31
3300 - Social Sciences	17
1600 - Chemistry	16
1900 - Earth and Planetary Sciences	16
1500 - Chemical Engineering	14
2600 - Mathematics	11
2500 - Materials Science	9
Biochemistry, Genetics and Molecular Biology	6
2300 - Environmental Science	4
2800 - Neuroscience	4

Pay attention, a journal can be linked to several subjects.

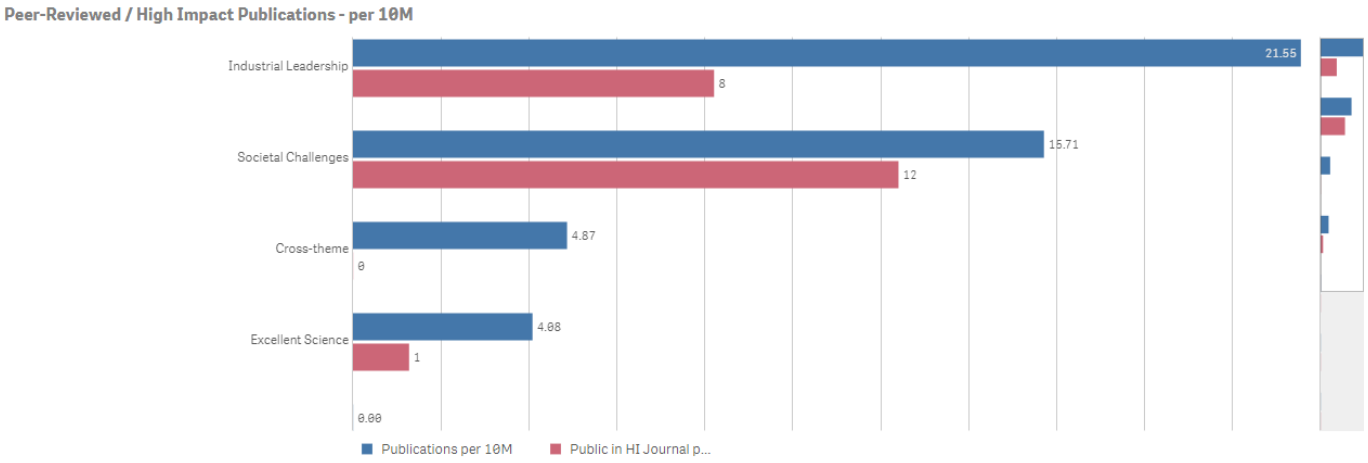
Innovation outcomes as top publication subjects.

Top Publication Subject Categories

Publication Category	Peer-Reviewed Publications
2705 - Cardiology and Cardiovascular Medicine	33
2208 - Electrical and Electronic Engineering	31
Cardiology and Cardiovascular Medicine	31
1706 - Computer Science Applications	26
2737 - Physiology (medical)	26
1314 - Physiology	24
2700 - General Medicine	16
1705 - Computer Networks and Communications	13
1912 - Space and Planetary Science	13
3103 - Astronomy and Astrophysics	13
1312 - Molecular Biology	11
1606 - Physical and Theoretical Chemistry	10
1503 - Catalysis	9
1604 - Inorganic Chemistry	9
1605 - Organic Chemistry	9

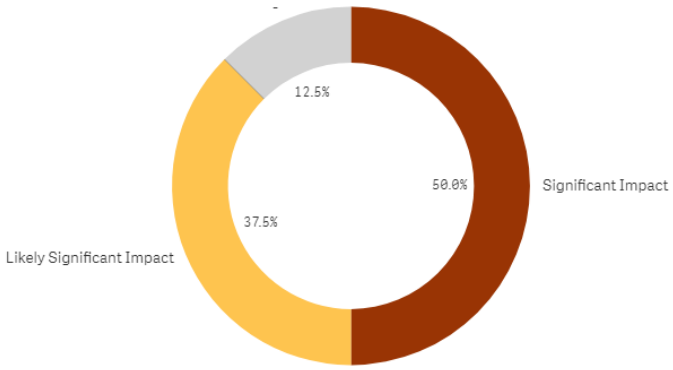
Pay attention, a journal can be linked to several categories.

Innovation outcomes as top publication subject categories



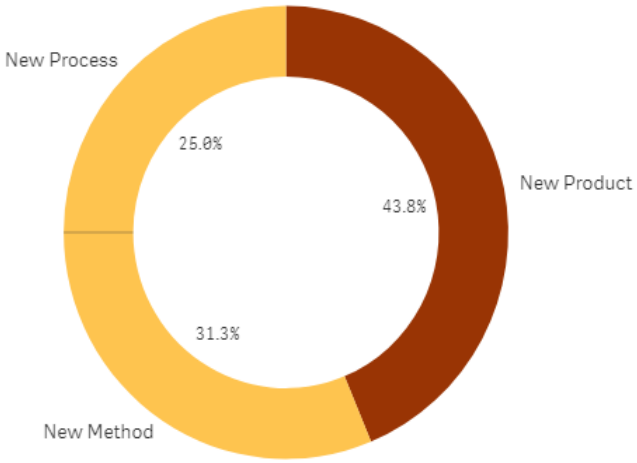
Innovation outcomes as peer-reviewed high impact publication per 10M

Grants having significant results linked to dissemination, exploitation and impact potential

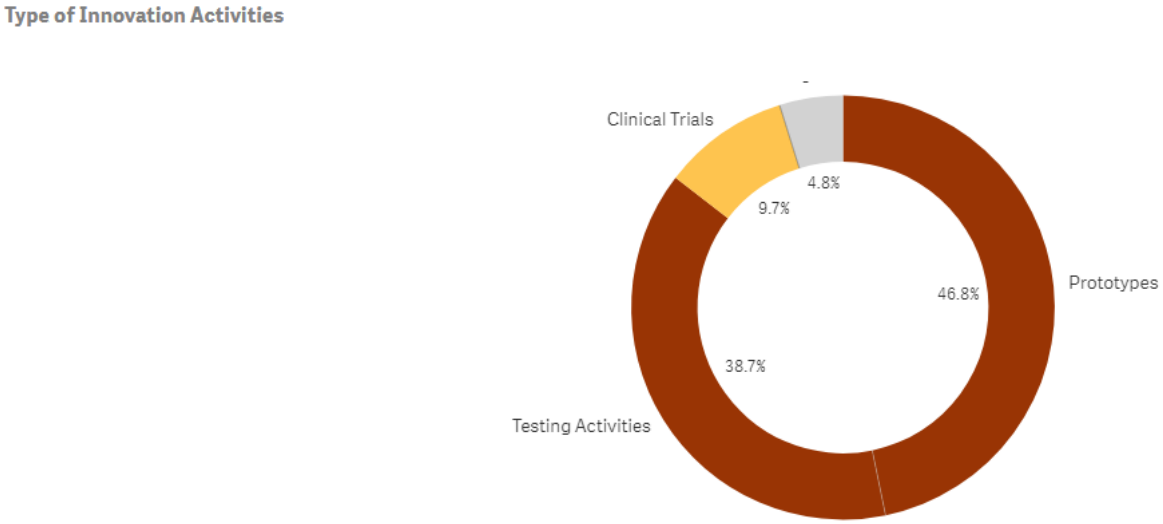


Innovation outcomes as IPR and patents.

Grants Introducing Innovation Types



Innovation outcomes as: protocols of (i) new production process, (ii) new application and (iii) new clinical methods; (iv) new prototyped products.



Innovation outcomes, as activities in:
(i) application testing protocols; (ii) clinical protocols from trials; (iii) prototyping.

Concluding, these aggregated analysis, discussion and assessment in both proposals and resulting outstanding projects revealed, illustrated, and demonstrated to what extent:

- Dominating terms such as AI, machine and deep learning, big data, and business models define both top and key interest focus: so, outstanding AI-enabled **industries will rely upon AI-powered machine and deep learning**, as well as big data.
- Most **AI-enabled science, research and innovation** takes place in Industrial Technologies & Manufacture, augmented Medicine & Healthcare, ICT, Mobility & Security, whereas a lesser share occurs in Sustainable Environment & Energy, and Ethical, Legal & Social disciplines.
- Constant **increase in EU funding on AI** takes place from 2020 to 2024, mostly in Germany, Spain, France, followed by Italy, Greece, and UK, whereas less occurs in Netherlands, Belgium, and remaining EU countries. Participants from academia are almost half, whereas the rest comes from research centers and private companies.
- Outstanding technological **innovation outcomes** from AI-powered projects essentially stem from science breakthroughs, and cutting-edge research, effectively assessed in terms of: (i) publications; (ii) IPR and patents, (iii) protocols – e.g., production, application, clinical; (iv) prototypes.

Discussion: successful and outstanding projects at cluster-specific level

The sets of successful and outstanding AI-powered projects have been qualitatively analyzed, assessed, and discussed at cluster-specific level, pooled in the following five clusters.

Altogether, 650 successful projects are synthetically displayed in Annexes I to V, where their basics are collected, addressed, and illustrated. Then, 86 outstanding projects are displayed in Annexes VI to X, where they have been extensively addressed, described, and detailed. Both sets are pooled in fine clusters, described below.

SUCCESSFUL PROJECTS (650 altogether)

I. Cluster I
   AI-enabled Industrial Technologies and Manufacture: 51 projects.
II. Cluster II
   AI-enabled Augmented Medicine and Healthcare, split in sub-branches: Diagnostics, Theragnostics, Targeted Drug-Delivery and Regenerative Medicine: 221 projects.
III. Cluster III
   AI-enabled Sustainable Environment and Energy: 83 projects.
IV. Cluster IV
   AI-enabled ICT, Mobility and Security: 205 projects.
V. Cluster V
   AI-enabled Ethical, Legal and Social disciplines: 90 projects.

OUTSTANDING PROJECTS (86 altogether)

- Cluster I
  AI-enabled Industrial Technologies and Manufacture: 22 projects.
- Cluster II
  AI-enabled Augmented Medicine and Healthcare, split in sub-branches: Diagnostics, Theragnostics, Targeted Drug-Delivery and Regenerative Medicine: 21 projects.
- Cluster III
  AI-enabled Sustainable Environment and Energy: 9 projects.
- Cluster IV
  AI-enabled ICT, Mobility and Security: 20 projects.
- Cluster V
  AI-enabled Ethical, Legal and Social disciplines: 14 projects.

The aggregated scientific excellence, technological achievements, and research perspectives stemming from both sets have been assessed in terms of: (a) *innovation outcomes*, (b) *science breakthrough* and (c) *research prospects*.

AI-enabled Industrial Technologies and Manufacture: Innovation Outcomes

Artificial intelligence (AI) has significantly transformed industrial technologies and manufacturing processes, leading to innovation outcomes in terms of technological advancements in automation, optimization, and efficiency across various sectors. There are several key areas where it has been demonstrated to what extent AI cross-fertilize and intersects with industrial technologies and manufacturing, providing valid insights. The key innovation outcomes attained by the selected projects industrial production and manufacturing are summarized and illustrated.

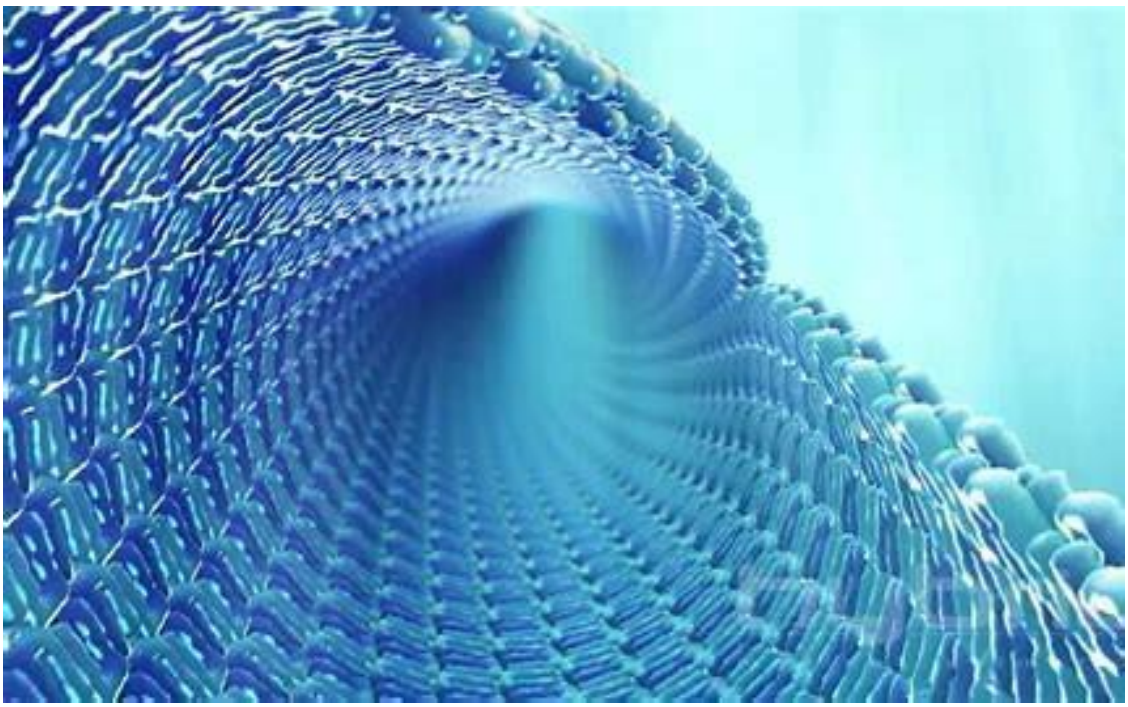
- **Proactive Maintenance**: several projects indicated to what extent AI algorithms can analyze vast amounts of sensor data from machinery and equipment to predict when maintenance is needed, preventing costly downtime, and optimizing production schedules. This enabled to optimize production costs, increase efficiency, and simultaneously reduce the associated environmental impact.
- **Enhancing Quality Performance**: most projects demonstrated that AI-powered systems can identify defects or anomalies in products by analyzing images, data from sensors, or acoustic signals, enabling manufacturers to maintain high-quality standards and reduce waste. This allowed higher efficiency levels, performing processes and procedures in the best possible way, increasing efficacy of the whole production processes, and simultaneously cutting waste and energy costs.
- **Boosting Supply Chain Efficiency**: several projects disclosed to what extent AI algorithms can analyze complex supply chain data to optimize inventory management, demand forecasting, and logistics, helping manufacturers streamline operations and reduce costs. This triggered a global optimization of the overall supply chain, simultaneously matching the requirements on the demand side in the best possible way: this resulted into a better efficiency gain in terms of the matching of supply and demand, increasing efficacy and user-friendliness of the entire supply chain.
- **Cross-fertilization of Robotics and Automation Outputs**: most projects showed to what extent AI-driven robots and automated systems are increasingly used in manufacturing processes to perform repetitive tasks, assembly, and material handling more efficiently and accurately than humans. This enabled to optimize most repetitive tasks, handling procedure and accuracy. Finally, this resulted into a better process and production efficiency, translated into economic and environmental and human labor gains.
- **Multi-targeted Process Optimization**: some projects demonstrated how AI techniques such as machine learning and optimization algorithms can

analyze production data to identify inefficiencies, optimize workflows, and improve overall manufacturing processes. This enabled to minimize inefficiencies and optimize the entire manufacturing cycle, finally resulting into better process and both economic and environmental gains.

- **Adaptive Manufacturing**: some projects illustrated how AI enables adaptive manufacturing processes that can respond dynamically to changes in demand, product specifications, or environmental conditions, allowing manufacturers to be more agile and responsive to market demands. This finally enabled to optimize the adaptabilities of the diverse production workflows, finally resulting into increased process agility and market gains.
- **Energy Footprint Process Optimization**: most projects revealed to what extent AI algorithms can optimize energy usage in manufacturing facilities by analyzing energy consumption patterns, identifying areas for improvement, and recommending energy-saving measures. This enabled to boost the energy efficiency levels, improving manufacturing processes and procedures, finally optimizing efficacy of the whole production workflows, and cutting both energy costs and the associated environmental impacts.
- **Human-Machine Interaction and Collaboration**: many projects demonstrated to what extent AI technologies facilitate collaboration between humans and machines in manufacturing environments, enhancing productivity, safety, and ergonomics. Finally, this impacted into a better man-machine interactions, resulting into better production efficiency, thus translated into attaining better economic and human labor gains.
- **Digital Twins**: few selected projects demonstrated to what extent AI-powered digital twin models replicate physical assets, processes, and systems in a virtual environment, allowing manufacturers to simulate and optimize production processes, predict performance, and troubleshoot issues before they occur. Finally, this impacted into the optimization of the production workflow, attaining better performance predictability which optimizes the efficacy of the whole production processes, cutting waste, energy requirements and costs, as well as the associated environmental impacts.
- **Cybersecurity**: few selected projects demonstrated to what extent AI-driven cybersecurity solutions help manufacturers detect and respond to cyber threats, safeguarding sensitive data, intellectual property, and critical infrastructure from malicious attacks. Finally, this resulted into attaining a better safeguard of IPR, data protection, and industrial infrastructures, therefore protecting the related market positions.

Overall, the analysis and assessment of these AI-enabled industrial technologies and manufacturing projects demonstrated to what extent the integration of AI with and within industrial technologies and manufacturing processes promises, manages, and guarantees to drive innovation and improve productivity,

simultaneously creating new opportunities for businesses in a rapidly evolving global economy.



AI-enabled Industrial Technologies and Manufacture: Science breakthroughs and Research prospects

Overall, scientific breakthroughs in AI have significantly impacted the manufacturing sector, thanks to revolutionized traditional processes powered by AI, therefore opening new avenues for innovation. In this light, AI is playing an increasingly significant role in advancing industrial technologies and manufacture across various domains. Stemming from the analysis of the selected projects, here are the main science breakthroughs and research prospects evicted from the selected projects, where AI is making a notable impact.

- **Quality Control thru Defect Detection**: here AI-enabled machine learning algorithms can inspect products in real-time, identifying defects with a high degree of accuracy. This improves product quality and reduces waste by identifying defects early in the manufacturing process.
- **Optimization of Supply Chain**: here AI algorithms can optimize supply chain processes by analyzing historical data, demand forecasts, and market trends. This enables manufacturers to make more informed decisions about inventory management, production scheduling, and distribution.

- **Generative Design**: here AI algorithms can generate optimized designs based on specified constraints and objectives. This enables engineers to explore a wider range of design possibilities and to identify solutions that may not be immediately apparent through traditional methods.
- **Smart Factories and IoT Integration**: here AI-powered algorithms facilitate the integration of Internet of Things (IoT) devices in manufacturing environments, creating "smart factories" where machines, sensors, and other equipment communicate and collaborate autonomously to optimize processes and productivity.
- **Optimization of Robotics and Cybernetics Interactions**: here AI-powered robots are increasingly being used in manufacturing for tasks such as assembly, pick-and-place, and material handling. Advances in computer vision and machine learning enable robots to adapt to changing environments and perform complex tasks with precision.
- **Predictive Maintenance**: here AI-powered algorithms can analyze data from sensors embedded in manufacturing equipment to predict when machines are likely to fail. This allows for proactive maintenance, reducing downtime and increasing overall equipment efficiency (OEE).
- **Customization and Personalization**: here AI-enabled algorithms enable mass customization by analyzing customer data and preferences to tailor products to individual needs. This allows manufacturers to offer personalized products at scale while maintaining efficiency in production.
- **Boosting Energy Efficiency and Sustainability**: here AI algorithms can optimize energy consumption in manufacturing processes by identifying opportunities for energy savings and reducing waste. This contributes to sustainability goals by minimizing environmental impact and reducing operating costs.
- **Man-Robot-Cobots Collaboration**: here AI-powered collaborative robots, or co-bots, which are equipped with AI capabilities can work alongside human workers safely and efficiently. This opens new possibilities for flexible manufacturing systems where humans and robots complement each other's strengths.
- **Explainable AI and Trustworthiness**: as AI systems become more pervasive in manufacturing, there is a growing need for transparency and interpretability of AI-powered scientific breakthroughs. Research in explainable AI aims at developing algorithms and techniques that provide insights into how AI systems make decisions, fostering trust and accountability in manufacturing processes.

These scientific breakthroughs and research prospects highlight the transformative potential of AI in manufacturing, driving efficiency, innovation, and competitiveness in the global marketplace. In fact, AI works as a lively and simultaneously overarching, dynamic and pervasive structure: building up upon a bunch of algorithms-based digital software and hardware to collect, store,

process, analyze and interpret data, AI relies upon systems of sensors and smart meters connecting equipment and data, mutually interlinked thru the Internet of Things.

Therein digital twins numerically represent the physical resources and their interdependencies, thus requiring intensive data densities, as well as cloud and high-performance computing capacities.[2] Doing so, AI-systems could simultaneously enable and guarantee enhancement in sustainable productivity: at the organization level, AI applications can design and outline demand forecasting to optimize and automate the development, optimization and mass-customization of new products and services, and mass-customization of their use in a responsible way. This may also boost resource efficiency: this may also impact on sustainability by optimizing human-driven tasks to oversight equipment and its maintenance, thus increasing its longevity, and decreasing costs, and ultimately humanizing production systems fostering human-centricity of both production and consumption systems.

Having defined and disclosed the purpose, content, and operating ways of AI, it is now enlightening to classify its pillars, i.e., systems of algorithms, into two broad conceptual construal categories, enablers, and application, respectively associated with AI-research and AI-innovation. On the one hand, AI-enablers are classified as ***Data***, i.e., (i) telemetry and (ii) customer data, as well as (iii) domain knowledge; and ***Infrastructures***, i.e., (i) sensors, (ii) IoT, (iii) digital twins, (iv) cloud-computing and (v) high-performance computing.[3] On the other hand, AI-applications are categorized as ***Organization*** i.e., (i) demand forecast and planning; (ii) automated warehouse management and (iii) automated design and customization; ***Processes*** i.e., (i) scheduling optimization; (ii) energy and resource efficiency; (iii) operator 4.0; and ***Physical assets***, i.e., (i) quality inspection and control; (ii) predictive maintenance; (iii) overall equipment effectiveness.[4]

More specifically, more research is needed to shape policy actions in at least two levels, i.e., (i) at management level there is an upmost need for training and raising awareness, while (ii) at workforce level deploying AI in synergy with the operator could optimize the uptake of its process and domain knowledge. In this light, planning proper workforce upskilling and training would be essential to ensure optimal AI deployment in terms of workflow management by powering the operator's domain knowledge. So, involving human resources at both workforce and management level is crucial in encouraging and promoting the AI

[2] Reworked from: (i) https://digital-strategy.ec.europa.eu/en/activities/edihs ; (ii) OECD (2019), *Enhancing Access to and Sharing of Data: Reconciling Risks and Benefits for Data Re-use across Societies*, OECD Publishing, Paris, https://doi.org/10.1787/276aaca8- en.

[3] JRC Report - AI Watch (2022): *AI uptake in Manufacturing*. Authors: Sarah de Nigris, Richard Haarburger, Jiri Hradec, Massimo Craglia, Daniel Nepelski. EUR 31121, European Union, pp.8-9.

[4] *Ibidem,* pp 11-12.

uptake into AI-enabled sustainable environment and energy sciences, research, technology, and related industries[5]. Last, boosting AI uptake would require policies to expand their horizon to extra-technological drivers, addressing also re-thinking and redesigning conventional processes, structures, and business models, therefore triggering the demand for new types of AI-related jobs, especially those associated with generative AI technologies.

Last, in the light of these principles, these actions could bring the EU from a current world leading position in AI enablers for sciences, research, technology and related industries towards their upgrading into a better positioning in AI-supported applications. In this light, policies should commit to advance the related AI scientific and research achievements from TRL3 towards TRL7, thru proper actions fostering their application-driven conception, design, and development into demo environment. Last, these policies should address upgrading of AI research and related skilling towards applications focused in most strategic AI-enabled sustainable environment and energy sciences, research, technology and related industries.

Reworked by the author from: https://openart.ai/create

[5] Reworked from: (i) OECD (2022), *Harnessing the power of AI and emerging technologies*: Background paper for the CDEP Ministerial meeting, (Authors: Perset Karine, et al.) *OECD Digital Economy Papers*, No. 340, OECD Publishing, Paris, https://doi.org/10.1787/f94df8ec-en, https://www.oecd-ilibrary.org/science-and-technology/harnessing-the-power-of-ai-and-emerging-technologies_f94df8ec-en; (ii) OECD (2019), *Enhancing Access to and Sharing of Data: Reconciling Risks and Benefits for Data Re-use across Societies*, OECD Publishing, Paris, https://doi.org/10.1787/276aaca8- en; (iii) JRC Report AI Watch (2022) : *AI uptake in Manufacturing* Authors: Sarah de Nigris, Richard Haarburger, Jiri Hradec, Massimo Craglia, Daniel Nepelski. EUR 31121, European Union, p.35; (iv) Peruzzini, M., Grandi, F., & Pellicciari, M. (2020). "Exploring the potential of Operator 4.0 interface and monitoring." Elsevier Science Direct, Computers & Industrial Engineering, Volume 139, January 2020, 105600, https://www.sciencedirect.com/science/article/pii/S036083521830651X .

AI-enabled Augmented Medicine and Healthcare: innovation outcomes

Overall, AI-enabled augmented medicine and healthcare have the potential to revolutionize the way we diagnose, treat, and manage various medical conditions. Here are the most prominent innovation outcomes already achieved, although it is already possible to outline a wide panoply of expected potentialities well going beyond them. The most promising and crucial innovation outcomes stemming from selected projects are already operational in the current clinical practices, as already being applied in augmented medicine and healthcare.

- **Medical Imaging**: most projects demonstrated to what extent AI-powered algorithms can analyze medical images such as X-rays, MRIs, and CT scans to assist radiologists in detecting abnormalities and making diagnoses. AI can help identify patterns and anomalies that might be missed by human eyes, leading to earlier detection and more accurate diagnoses. Finally, this impact onto the optimization of the imaging production workflow, attaining performance predictability which boosts efficacy of the processes, enhancing accuracy, efficiency, and overall performance.
- **Drug Discovery**: several projects showed to what extent AI-powered algorithms expedite the drug discovery process by analyzing vast amounts of biological data to identify potential drug candidates and predict their efficacy and safety profiles. This can significantly reduce the time and cost involved in bringing new drugs to market. Finally, this impact into the optimization of the overall drug design and development, improving both drug safety and performance, thus maximizing efficacy and safety as well as market gains.
- **Personalized Medicine**: several projects showed to what extent AI-powered algorithms can analyze individual patient data, including genetic information, medical history, and lifestyle factors, to tailor treatment plans and interventions to each patient's unique characteristics. This can lead to more effective treatments with fewer side effects. Finally, this results into the optimization of the overall patient treatment design and development, therefore improving its associated safety and performance profiles.
- **Remote Monitoring and Telemedicine**: many projects illustrated how AI-powered devices and applications can remotely monitor patients' vital signs, activity levels, and symptoms in real-time: this is equipping the healthcare providers with useful tools to proactively intervene whenever necessary, therefore enabling patients to receive care from the comfort of their own homes. Finally, this impacts into the optimization of the overall design and development of patient monitoring system and protocols, proactively improving home treatments, and boosting their associated safety and performance.

- **Predictive Analytics**: few projects demonstrated how AI-powered systems can analyze large datasets of patient information to identify patterns and trends that can help predict disease outbreaks, anticipate patient deterioration, and optimize resource allocation within healthcare systems. This finally results into the optimization of the overall design and development of patient disease predictive models, systems, and protocols, optimizing resource use; simultaneously, enabling to develop more targeted treatments characterized by higher accuracy, predictability, safety, and performance.
- **Virtual Health Assistants and Chatbots**: some projects showed to what extent AI-driven virtual health assistants and chatbots can provide patients with personalized medical advice, answering to questions about symptoms and treatments, scheduling appointments, and even providing mental health support. This finally impacts into the optimization of the overall design and development of patient disease personalized advise, maximizing resource use efficiency, targeted treatments, and the overall patient support performance.
- **Surgical Assistance**: many projects illustrated to what extent AI-powered robotic systems can assist surgeons during minimally invasive procedures by providing real-time feedback, enhancing precision, and reducing the risk of human error. Finally, this results into the optimization of the overall design and development of surgical models, systems, and clinical protocols, improving surgery efficiency, accuracy, predictability, safety, and performance.
- **Healthcare Administration and Management**: few projects showed how AI can streamline administrative tasks such as billing, scheduling, and record-keeping, allowing healthcare providers to focus more time and resources on patient care. Finally, this resulted into the optimization of the overall design and development of resource models, systems, and clinical protocols, boosting healthcare efficiency.

Summarizing, while AI has the potential to significantly improve healthcare outcomes and efficiency, there are also challenges and considerations related to data privacy, security, ethics, and the need for human oversight and interpretation of AI-generated insights. As AI technologies continue to evolve, it will be important for healthcare professionals, policymakers, and patients to work together to ensure that AI is deployed responsibly and ethically to maximize its benefits while minimizing potential risks.

AI-enabled Augmented Medicine and Healthcare: science breakthroughs and research prospects

Overall, scientific breakthroughs in AI have significantly impacted augmented medicine and healthcare sector, dedicated to optimizing conventional medical processes, procedures, and protocols, as well as opening and expanding novel avenues for innovation. Here are the key science breakthroughs and research prospects stemming from the analysis of the selected projects, where AI is making a notable impact.

Augmented medicine and healthcare, powered by AI, offer promising avenues for breakthroughs and research prospects across various domains. Key areas where AI is poised to make significant contributions are addressed accordingly. Overall, Diagnostics, Targeted Drug-Delivery, Theragnostics, and Regenerative Medicine are the main branches of AI-powered Augmented Medicine, impacting onto the overall Healthcare sector.

- **Diagnostics**: here AI-powered algorithms analyze medical images such as X-rays, MRIs, and CT scans with remarkable accuracy, aiding in the early detection and diagnosis of diseases like cancer, neurological disorders, and cardiovascular conditions. Different AI-powered sub-branches stem and are therefore included under Diagnostics umbrella.

    - **Personalized Patient-Specific Medicine**: by leveraging AI-powered technologies, such as machine learning and data mining, healthcare providers can analyze patient data, including genetic information, lifestyle factors, and medical history, to tailor treatment plans and interventions based on individual patient needs.
    - **Remote Patient Monitoring**: here AI-enabled sensors and wearable devices can continuously monitor patients' health metrics and alert healthcare providers to any abnormalities or potential health risks, enabling timely interventions and reducing the need for frequent hospital visits.
    - **Predictive Analytics and Disease Prevention**: here AI-enabled algorithms are capable to analyze population-level health data to identify patterns, trends, and risk factors associated with various diseases, enabling proactive measures for disease prevention and public health interventions.
- **Drug Design, Development and Delivery**: here AI-enabled algorithms are capable to shape AI-driven platforms, which subsume diverse sub-branches, dedicated to accelerating i.e.,
    - **virtual drug design**, which could be targeted to infer design conditions, settings, and datasets.
    - **personalized drug development**, where AI-empowerment can promote and target drug conception, design, discovery, and development process on custom-made conditions.
    - **virtual drug testing**, where analyzing vast datasets aims at identifying potential drug candidates, thus predicting their efficacy and optimizing their molecular as well as protein structures testing.
- **Theragnostics**: here AI-powered algorithms analyze medical diagnostics to target appropriate therapeutic treatments, plans, protocols, and procedures, by addressing:
    - **modulation of diagnostics and therapeutic protocols:** here AI-powered algorithms address, analyze, and assess clinical diagnostics to design and modulate the appropriate therapeutic plans, treatments, and protocols.
    - **Natural Language Processing (NLP) for clinical documentation**: here AI-powered systems based on NLP algorithms can automatically extract relevant information from electronic health records (EHRs), clinical notes, and medical literature: by facilitating more efficient documentation, information retrieval, and decision-making to healthcare providers, these systems are vowed to address the most appropriate therapies according to the diagnostics inputs.
    - **virtual health supports**: here AI-driven virtual assistants and chatbots can interact with patients, answer their medical queries, provide personalized health advice, schedule appointments, and even offer mental health support, enhancing patient engagement and

access to healthcare services. This is finally vowed to fine-tune therapies based on the proper diagnostics lookouts.

- **Regenerative Medicine**: here AI-powered algorithms analyze medically relevant parameters such as nano- and micro-scaffolds structures, assessing their organization patters and degrees. Different AI-powered sub-branches are addressed, i.e.,
    - **assisting regenerative robotics**: here AI-powered algorithms are shaping AI-powered cobots which can assist reconstructive and regeneration processes, deploying complex operations, processes, and procedures with augmented accuracy, precision, and control; this finally leads to improved cells, tissues, as well as organs reconstruction, delivering higher levels of regeneration precision, and improved patient outcomes, simultaneously minimizing the associated risks of complications.
    - **supporting reconstruction tools and systems**: here AI-enabled tools and systems vowed to evaluate steps, phases, and overall performances in reconstruction of cells, stems cells, tissues, and organs, analyzing their regeneration progresses and integration at various levels and degrees: doing that properly, they aim at performing remarkable accuracy, aiding in the early detection of anomalies of the regeneration processes.
    - **cybernetics surgery and minimally invasive procedures**: here AI-powered algorithms are shaping AI-powered surgical robots and cobots which can assist surgical operations; by performing complex procedures with AI-enabled higher precision, efficiency, dexterity, and control, they ultimately lead to impacting into higher levels of precision medicine, improved patient outcomes, and reduce risks of complications.
- **Assisting Healthcare Supports**: overall, AI-powered tools apply to the global healthcare systems, touching all illustrated branches and sub-branches Diagnostics, Targeted-Drug Delivery, Theragnostics, and Regenerative Medicine; in fact, here AI algorithms can optimize healthcare operations by predicting patient flow, resource utilization, and staffing needs, leading to more efficient allocation of resources, reduced waiting times, and finally improved quality of care.
- **Ethical and Regulatory Considerations**: similarly, as AI-enabled technologies and AI-powered scientific breakthroughs become more pervasive in healthcare, it is crucial to address ethical, legal, and regulatory challenges related to data privacy, security, bias, transparency, accountability, and patient consent to ensure responsible and equitable deployment of AI-enabled solutions. They apply transversally and horizontally to all branches of augmented medicine and healthcare addressed above.

Research in these areas holds immense potential to transform healthcare delivery, improve patient outcomes, and enhance the overall quality, accessibility, and affordability of healthcare services. However, it also requires interdisciplinary collaboration among researchers, clinicians, policymakers, and industry stakeholders to address technical, clinical, regulatory, and societal challenges effectively.

On IPR side it has been demonstrated to what extent EU has a strong position at the initial stages of AI in overall clinical, biomedical, and pharmaceutical manufacturing R&D: EU scientific outputs double that of US and China, whilst becomes weaker in innovation and market applications. Also, US is the most influential country with respect to patenting activity, though China dominates patent ownership though citing mostly Chinese assignees.[6]

In this light, the dominant innovative power for AI in clinical, biomedical, and pharmaceutical manufacturing in the EU originates more from a few ground-breaking companies rather than from independent institutional research facilities.[7] On the one side, EU demonstrates a relative scientific specialization accounting for two thirds of *AI enablers'* patents: among them, micro and **nanotechnology** takes the lion's share of the patenting output, i.e., its highest specialization, followed by **biotechnology** and **pharmaceuticals**[8]**.** On the other hand, EU is underperforming in terms of AI *application patents*, compared to US and China.

Within overall manufacturing, nanotechnology takes the most promising share of micro-and-nanotechnologies sector: so, these three main sciences and associated technological applications are aggregated and considered into a complex named **nano-bio-pharma** sciences. Overall, nano-bio-pharma sciences is an interdisciplinary field that combines the principles of nanotechnology, biology, and pharmaceuticals to develop novel diagnostics and therapeutics – as well as their combination into theragnostics[9] – innovative drug delivery systems, usually oriented towards minimizing unwanted effects and backfires, as well as regenerative medicine. This is ultimately definitely oriented towards conceiving, developing, and deploying personalized and customized medicine approach using

[6] *Ibidem*, pp 4-5 and 22.

[7] De Nigris, S., Craglia, M., Nepelski, D., Hradec, J., Gomez-Gonzales, E., Gomez Gutierrez, E., Cardona, M. (2020). AI Watch: *AI Uptake in Health and Healthcare* -JRC Technical Reports*: JRC, pp.22-23.*

[8] Reworked from: (i) *JRC, Elsevier Scopus data analysis* (2022): complete metadata obtained by JRC for articles concerning manufacturing and AI from the Elsevier API; (ii) JRC Report AI Watch (2022). *AI uptake in Manufacturing* Authors: Sarah de Nigris, Richard Haarburger, Jiri Hradec, Massimo Craglia, Daniel Nepelski. EUR 31121, European Union, pp.25-26 (Figures 12 and 13).

[9] Frangos, S., Buscombe, J.R. Why should we be concerned about a "g"?. *Eur J Nucl Med Mol Imaging* **46**, 519 (2019). https://doi.org/10.1007/s00259-018-4204-z . Therein, Prof. George Babiniotis, i.e., Emeritus and Honorary Professor of Linguistics and former Rector (2000–2006) of the University of Athens, clarifies the dispute on the etymons "theranostics" versus "theragnostics", robustly demonstrating that: "Theragnostics is the better term. In theranostics the second part of the word *nostics* refer more to the disease than diagnostics. Linguistically the better approach is a synergy of the two words *therapo-gnostics* because *thera* alone does not refer to therapy and could be confused with the Greek word for hunting."

nanoscale phenomena, i.e., nano-biomedicine. This is finally rooted on the application of nano-biological sciences, which use that nanoscale effects and behaviors characterizing the nano-dimensions and their associated dynamics and phenomena, including their related physics and chemistry.[10]

More specifically, the use of nanotechnology in pharmaceuticals develops novel drug delivery systems which have the potential to scrutinize and improve the efficacy of drugs, simultaneously reducing their side effects, i.e. targeted drug delivery systems. These rapidly developing branches of science use mostly nanomaterials, which stem from smart material sciences using and exploiting the nanoscale phenomena and associated effects. These nanomaterials can be employed to regenerate cells, tissues, and organs, as well as to build novel diagnostic tools, therapies and to deliver and target therapeutic agents into specific receptor sites in a controlled manner. For all that above, these branches of science altogether address personalized medicine and healthcare as ultimate endpoints, thus can be pooled into ***diagnostics***, ***theragnostics***, ***targeted drug-delivery*** and ***regenerative medicine***.[11]

It has been afore pinpointed that EU dominates in terms of AI enablers patents in overall clinical, biomedical, and pharmaceutical manufacturing, and to what extent this leading scientific position is especially due to the prominent role displayed by nano-bio-pharma sciences: it has been also pinpointed how this is

[10] Patra, J.K., Das, G., Fraceto, L.F. *et al.* (2018). "Nano based drug delivery systems: recent developments and future prospects." *J Nanobiotechnol* **16**, 71 (2018). https://doi.org/10.1186/s12951-018-0392-8, at: Nano based drug delivery systems: recent developments and future prospects | Journal of Nanobiotechnology | Full Text (biomedcentral.com)

[11] Bonazzi, M. (Ed.) (2013); Authors : Filipponi, L., Sutherland, D. *Nanotechnologies: principles, applications, implications and hands-on activities - A compendium* for *educators*; ISBN 978-92-79-21437-0, EUR 2495, doi:10.2777/76945, catalogue KI-NA-24-957-EN-C.

mostlyy relying on selected ground-breaking companies rather than on independent institutional research facilities. So, in this way EU scientific outputs dominate those from US and China, whilst becoming weaker in innovation and market applications: thus the EU is relatively underperforming in *AI application* patents, also in nano-bio-pharma industries, accounting for solely one third of the overall bulk.[12] In fact, a revealed comparative specialization for application patents is not as strong as in enablers' patents, i.e., EU scientific outputs from TRL 3 to 6 outshine innovation outcomes, which range from TRL7 onwards.

This is confirmed by the analysis of the scientific publication production. On the one hand, China, the US, and the EU are global leaders in scientific production of publications related to AI applications in science, leading their overall faster increasing number since 2017. On the other hand, China is world leader in the number of top publications associated with AI application in science, as well as their average yearly growth rate and projected numbers, and this last is particularly striking in both biomedical and neurosciences.[13] However, the widening gap between China and its counterparts is narrowed when accounting for the quality outputs, as Chinese sourced cross-references dominate in Chinese papers.[14]

More specifically, in the EU, assignees for enabler and application patents are diverging, being quite different: academies and research centers hold enabler patents, while private companies dominate in application patents: as in other cutting-edge scientific and technological systems, the so-called 'Death Valley' is still lingering on the gap between TRL3 and TRL 7. In fact, academic and extensively research-based enablers largely fall into TRL2-3 and seldom TRL4, and in quite rare cases it might mature up to TRL5.[15]

In this light, there is still a long way to market application in the EU, as research hardly gets thru all the way until TRL9: in fact, it is often quite tough to demonstrate and substantiate to tweak an enabler research patent, whose proof of concept has been achieved, to also work in a relevant demo environment. On the one hand, it would need and involve a lot of hard work, with limited immediate benefit for the academic research. On the other hand, companies, usually do not aim at operating anything below TRL 7, as they seldom rely on research departments working below TRL 6: the risk-reward ratio is not rewarding enough.

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[12] Reworked from: De Nigris, S., Craglia, M., Nepelski, D., Hradec, J., Gomez-Gonzales, E., Gomez Gutierrez, E., Cardona, M. in AI Watch (2020): *AI Uptake in Health and Healthcare* JRC Technical Reports: JRC.

[13] Arranz, D., Bianchini, S., Di Girolamo, V., J. (2023): *Trend in the use of AI in Science - A bibliometric analysis*, Working Paper Series 2023/04; ISBN: 978-92-68-04289-2 doi: 10.2777/418191: Fig1. p.10; Fig.2 p.11; Fig.7, p.8; Fig.10, p.17.

[14] *Ibidem*, Fig.10, p.17.

[15] Leitner, P., 2013. *TRL, impact of science and the valley of death*, Gothemburg University, http://philippleitner.net/technology-readiness-levels-impact-of-science-and-the-valley-of-death/

So, although in the EU lots of academically thoroughgoing and rigorous research ideas in lower TRLs might be attractive and even quite sound in principle, their application in demo environments involves such a high degree of risk which companies are reluctant to take.[16] As a consequence, their capability to engender innovation in higher TRL is weak, hindering their practical usefulness in terms of matching market uptake and societally relevant needs. This clearly calls for committing to exploring room for action opening the floor to venture capital initiatives for innovative start-up and SME ecosystems: and, quite obviously, for far-sighted policy actions.[17]

Overall, US and China are the largest recipients of Venture Capital funding (i.e., global investments) in AI for overall manufacturing, respectively 59% and 15%, while EU accounts for 7% solely, where Germany, France, and Sweden account for two thirds altogether. Clinical, biomedical, and pharmaceutical manufacturing largely mirror these figures. Also, Germany, France, Italy, and Spain lead in EU AI uptake in both overall manufacturing as well as in clinical, biomedical, and pharmaceutical manufacturing, while the start-up ecosystem scatters over EU.[18] These considerations particularly apply to nano-bio-pharma industries, where the SME ecosystem outlook is particularly widespread over these five countries and across EU too.[19]

As an example of all that, according to key nano-bio-pharma companies e.g. Pfizer and Novo Nordisk, AI could even enable predicting drug efficacy and side effects, by managing vast amounts of data, info and documentation more extensively than anything accessible or powered before by any single pharmaceutical company[20] In this case, AI is currently being used for ground-breaking research supporting theragnostics, drug discovery, and regenerative medicine, e.g. gene-sequencing, for predicting, unveiling and identifying unknown and uncovered patterns in genomic data: this AI-enabling power would lead to embolden previously huge research diseases and potential treatments,

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[16] *Ibidem*

[17] Reworked from: (i) Bonazzi, M., (Ed.) (2011). *Successful European Nanotechnology research.* EUR n°: 24055; 24524; catalogue n°: KI-NA-24524-EN-C; ISBN: 978-92-79-15623-6, http://ec.europa.eu/research/industrial_technologies/publications-reports_en.html;
(ii) Bonazzi, M. (Ed.) (2013); Authors: Filipponi, L., Sutherland, D. *Nanotechnologies: principles, applications, implications and hands-on activities - A compendium* for *educators*; ISBN 978-92-79-21437-0, EUR 2495, doi:10.2777/76945, catalogue KI-NA-24-957-EN-C.

[18] Reworked from: (i) JRC (2022) *Elsevier Scopus data analysis - complete metadata obtained by JRC for articles concerning manufacturing and AI from the Elsevier API*; (ii) JRC Report AI Watch: (2022) *AI uptake in Manufacturing* Authors: Sarah de Nigris, Richard Haarburger, Jiri Hradec, Massimo Craglia, Daniel Nepelski. EUR 31121, European Union.

[19] *Ibidem*

[20] JRC Report AI Watch (2022) : *AI uptake in Manufacturing* Authors: Sarah de Nigris, Richard Haarburger, Jiri Hradec, Massimo Craglia, Daniel Nepelski. EUR 31121, European Union, pp 27-28 and Figure 16 (specifically reworked).

enabling unthinkable capabilities for a single pharmaceutical company before the AI advent.

From these considerations it is possible to go deep into a more detailed discussion on AI-enabled science breakthroughs and research prospects: these can be draw in diagnostics, theragnostics, targeted drug-delivery and regenerative medicine. Overall, it has been pinpointed to what extent AI scientific breakthroughs are becoming increasingly embedded in research and technologies applied into nano-bio-pharma industries, where EU dominates in terms of intellectual property in AI-enablers' patents. However, their translation into applicative innovations become increasingly challenged on many edges, e.g., largely generated volumes of data, data mining, lack of standards, subjectivity of data interpretation: all that jeopardizes objectivity, often leading to bias.

Overall, it can already be evicted how far AI could embrace a quite powerful set of tools able to increase speed, efficiency, and effectiveness of global health systems: analyzing large amounts of data in real time, AI can help improve clinical and non-clinical decision-making, reducing medical variability, and optimizing resources. Hence, AI could support the development of nano-bio-pharma industries impacting on augmented medicine and healthcare by synergizing across the diverse fields of science involved, by detecting, identifying, characterizing, and processing at very high-speed enormous volumes of data, sometimes even not standardized, stemming from an extensive range of diverse patient-specific symptoms, specificities, anamnesis, pathologies, aetiology and co-morbidities.

In this sense machine learning and deep learning could represent a very promising novel approach to medical, biological, and clinically relevant data mining and interpretation: this could be leading to achieve better efficiency and accuracy of the analysis of very large amounts of data sets to predicting innovative outcomes. However, there is still an existing gap between the existing and achieved nano-bio-pharma AI-enablers technologies and AI-applications. So, forthcoming policy and decision-making process should become more committed

to fostering novel business models leading towards human-centric ground-breaking AI-applications, and their associated product and service development. Still, bridging the gap between science and research to advance technological innovation claims for the need for actions from many other stakeholders and actors beyond policy makers.

Overall, AI presents quite promising prospects in nano-bio-pharma industries applied to medicine and healthcare, which would deserve utmost attention from policymakers. On the one side, although widening the impressive innovation potentials in nano-bio-pharma industries, AI opens the floor to launch new technology innovative pathways whose outcomes are still tough to predict, as they are still largely unexploited. On the other side, although nano-bio-pharma industries would possibly bring real breakthrough in augmented medicine and healthcare, physicians will most likely not be displaced by AI-systems, although their capabilities and performances could be largely improved, enhanced, or augmented, by them. In fact, AI-based smart medical technologies could and would support the physician to improve patient management in disease detection, diagnose and treatment, without abdicating their key steering role in assuming their ultimate decisions.[21] This sounds particularly reassuring in terms of the ethical acceptability and trustworthiness of AI in augmented medicine and healthcare, which might not be the case in other AI-enabled application industries (e.g., ICT, security, and mobility).

In this light, there is a need for developing dedicated future studies to address a targeted comparisons between physicians using AI-supported solutions with others not using them, then extending those studies to translational clinical trials. So, AI would be more smoothly accepted by healthcare operators as a quite efficient complementary tool for physicians, without jeopardizing their ultimate decision-making in terms of disease identification, diagnostic and treatment. In this sense, AI-supported digital evolution could become the main driver of change, and in this sense a major revision of medical professionals is needed to provide them with the AI-augmented competences.[22] This development would also raise the need for validation of these modern tools with traditional clinical trials, as well as it is likely to extend the debate to the educational upgrade of the medical curriculum in light of digital medicine and healthcare. Clearly, deeper ethical considerations of the ongoing connected and augmented digital medicine and healthcare would also arouse specific debates.

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[21] Reworked from: (i) Giovanni Briganti and Olivier Le Moine. 2020. "Artificial Intelligence in Medicine: Today and Tomorrow." Frontiers in Medicine, 7; (ii) (The) Economist, 2022. "The future medical AI", https://www.economist.com/films/2022/02/15/the-future-of-medical-ai ; (iii) De Nigris, S., Craglia, M., Nepelski, D., Hradec, J., Gomez-Gonzales, E., Gomez Gutierrez, E., Cardona, M. AI Watch (2020): *AI Uptake in Health and Healthcare* JRC Technical Reports: JRC.

[22] Reworked from: (i) Briganti, G. and Le Moine, O., 2020. AI in medicine: today and tomorrow, in PERSPECTIVE article, Front. Med., Sec. Translational Medicine, https://www.frontiersin.org/articles/10.3389/fmed.2020.00027/full ; (ii) Giovanni Briganti and Olivier Le Moine. 2020. "Artificial Intelligence in Medicine: Today and Tomorrow." Frontiers in Medicine, 7

Summarizing, what AI-augmented medical science is not expected to do is making human experts redundant, which is quite encouraging for the ethical side of AI applied to healthcare: in fact, machine-learning systems work on a narrow range of tasks and will need close supervision, at least for years to come. They are perceived by physicians and healthcare operators as "black boxes", where it is not known what and how they reach their decisions, and on what basis[23]. However, they will take much of the labor and error out of diagnosis, also helping to make sure that patients are treated in time to be saved or recovered, leaving the ultimate steer to physicians.

Because of that, AI in augmented medicine and healthcare is expected to bring prominent breakthroughs in various cutting-edge application fields, which are particularly promising: among them, diagnostics, theragnostics, precision medicine, targeted drug-delivery, regenerative medicine, including gene therapy and genomics. Thus, by expanding and projecting all reasonably conceivable AI potentialities, it is possible to outline to what extent AI-supported technological innovations could successfully support nano-bio-pharma applications in medicine and healthcare, especially in the following aggregated fields[24]: (i) diagnostics; (ii) theragnostics; (iii) targeted-drug delivery; and (iv) regenerative medicine. Thus, it is possible to expand some prospective considerations of future AI impacts therein.

Diagnostics

It is clear enough that AI might make medicine and healthcare more patient-specific, precise, customized and personalized, by being able to draw distinctions at patient level that usually can elude human observers This is particularly evident in diagnostics, as it may be able to grade cancers or instances of patient-specific cardiac disease according to their potential risks, detecting and processing at a high speed large volumes of data, stemming from vast range of symptomatology, patient specificities, anamnesis, aetiology and co-morbidities. Also, it is possible to evict a set of specialized sub-fields where AI is currently under improvement, although it is already outlining some promising outcomes. [25]

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[23] *Ibidem*

[24] Reworked from: (i) Bonazzi, M., (Ed.) (2011). *Successful European Nanotechnology research.* EUR n°: 24055; 24524; catalogue n°: KI-NA-24524-EN-C; ISBN: 978-92-79-15623-6, http://ec.europa.eu/research/industrial_technologies/publications-reports_en.html;
(ii) Bonazzi, M. (Ed.) (2013); Authors: Filipponi, L., Sutherland, D. *Nanotechnologies: principles, applications, implications and hands-on activities - A compendium* for *educators*; ISBN 978-92-79-21437-0, EUR 2495, doi:10.2777/76945, catalogue KI-NA-24-957-EN-C.

[25] Reworked from: (i) (The) Economist, 2022. "The future medical AI", https://www.economist.com/films/2022/02/15/the-future-of-medical-ai; (ii) (The) Economist, 2018. "AI will improve medical treatments", https://www.economist.com/science-and-technology/2018/06/09/artificial-intelligence-will-improve-medical-treatments ; (iii) Briganti, G. and Le Moine, O., 2020. AI in medicine: today and tomorrow, in PERSPECTIVE article, Front. Med., Sec. Translational Medicine,

Cardiology

Atrial Fibrillation

AI can support early detection of atrial fibrillation thru a smartphone. The company AliveCor received FDA approval in 2014 for their remote mobile application named 'Kardia', allowing for a smartphone-based ECG monitoring and detection of atrial fibrillation. This was shown to perform more efficiently in ambulatory patients than in routine care. Also, the company Apple obtained FDA approval for their Apple 'Watch 4', allowing easy access to ECG data to detect atrial fibrillation. However, some critiques showed some issues related to wearable and portable ECG devices, highlighting some limitations to their use, such as false positive rate originated from mobile artefacts, together with raising some uptake barriers of wearable technology in the elderly.

Cardiovascular Risk

Applied to electronic patient records, AI has been used to predict the risk of cardiovascular disease, e.g., acute coronary syndrome and heart failure better than conventional approaches. Recent comprehensive reviews have however reported how results can significantly vary depending on the sample size used: so, more validation steps are needed.

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https://www.frontiersin.org/articles/10.3389/fmed.2020.00027/full (ii) Giovanni Briganti and Olivier Le Moine. 2020. "Artificial Intelligence in Medicine: Today and Tomorrow." Frontiers in Medicine, 7; (iv) AIO, 2017. Supercharge healthcare with AI, https://www.cio.com/article/234837/supercharge-healthcare-with-artificial-intelligence.html

Pulmonary Medicine

Successful AI-supported interpretation of pulmonary function tests has been reported as a promising field for the development of AI applications in pulmonary medicine. AI-based software provides very accurate interpretation, becoming a useful decision support tool when inferring results from pulmonary function tests. However, some critique pinpointed that the rate of accuracy in diagnosis within the tested participating pulmonologists was considerably lower than the corresponding country average.

Gastroenterology

An extensive range of AI-based applications are in place in clinical settings. Convolutional neural networks are widely used to process images from

endoscopy and ultrasound, detecting abnormal structures e.g., colonic polyps. Artificial neural networks are useful to diagnose and treat gastroesophageal reflux disease, atrophic gastritis, gastrointestinal bleeding, survival of esophageal cancer, inflammatory bowel disease, metastasis in colorectal cancer and esophageal squamous cell carcinoma.

Histopathology

AI-based algorithm are shown to be capable of diagnose cancer in computational histopathology with almost great accuracy, gaining time to focus on crucial slides. One virtuous case is attributed to company Paige, which conceived and developed this tool, inspiring the development of others.

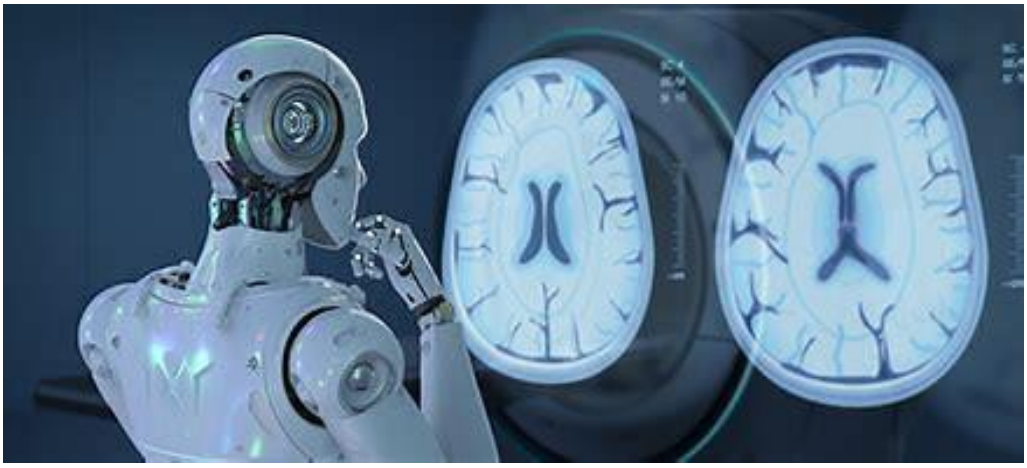
Medical Imaging

Thanks to AI-supported medical imaging, physicians can identify conditions much quicker, promoting early intervention: this enables their improved accuracy rate in detecting and diagnosing cancers, e.g., colorectal cancer, by analyzing tissue scans as well or better than pathologists. In this respect, meta-analysis reports have compared performances of deep learning software and radiologists in the field of imaging-based diagnosis. Overall, deep learning seems to be as efficient as radiologist for diagnosis, although most studies were not found reliably designed, as too few have reliable and trustworthy algorithms able to diagnose medical imaging coming from diverse and varied source populations. So, extensive validation of AI-based technologies thru rigorous clinical trials is still needed. AI can reconstruct missing data in coarsely sampled, rapid magnetic resonance imaging (MRI) scans into high-quality images with similar diagnostic value compared with conventional MRI imaging.

Neurology

Epilepsy
AI-based systems including specific captors can detect generalized epilepsy seizures and report to a mobile application that is able to alert physician with patient localization. The company 'Empatica' received FDA approval in 2018 for having developed the wearable named Embrace, which is associated with electro-dermal captors: it can detect generalized epilepsy seizures and report to a mobile application. It should be noted that, in comparison to heart monitoring wearables, patients suffering from epilepsy had not shown significant barriers in the adoption of seizure detection devices. Last, AI algorithms for mental healthcare are successful in detecting symptoms of depression, and other mentally harming conditions by analyzing behavioral signals.

Gait, posture, tremor assessment
Diverse AI-supported wearable sensors have proven useful to quantitatively assess gait, posture, and tremor in patients affected by diverse pathologies, e.g., multiple sclerosis, Parkinson disease, Parkinsonism, and Huntington disease.



Theragnostic

Endocrinology
AI can enable continuous glucose monitoring to help diabetes patients to monitor the rate of change of blood glucose levels. In fact, the continuous glucose monitoring is effective by enabling patients affected by diabetes to check real-time interstitial glucose readings, simultaneously providing feedback about direction and rate of blood glucose level change. The company 'Medtronic' received approval from FDA for their smartphone-supported 'Guardian' system for glucose monitoring, which is promising. Then, the same company partnered with 'Watson' IBM-developed AI for the 'Sugar.IQ' system they developed, enabling patients to prevent hypoglycemic crisis by repeatedly measurements.

However, although expressing confidence in the notifications, patients seemingly felt significant personal failure in regulating their glucose levels.

Nephrology

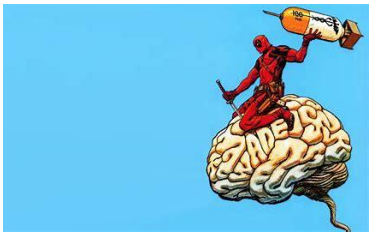
AI can help several settings in clinical nephrology, e.g., to predict of the decline of glomerular filtration rate in patients with polycystic kidney disease, and for risk assessment in other nephropathies. However, limits have been shown in the sample size of the studies carried out so far, currently restraining the actual efficacy in carrying out both the accurate diagnostic and its associated treatment.

Oncology

Oncological AI applications operate thru data intelligence, enabling better tumor understanding, defining more precise treatment options and improved decision-making. In fact, AI-enabled big data processing would allow the development of personalized and customized treatments for cancer patients. Among them, AI tools are used to aid screening tests for detecting, diagnosing, and predicting several kinds of cancer, e.g., colorectal, lung, breast, prostate, skin, (developed by Stanford university, from 2017), eye (developed by DeepMind company, from 2020). Within the early cancer detection tools, Grail's company Galleri test (namely one of Time magazine's best inventions of 2022) is a multi-cancer early detection blood test to spot early signals in the blood that are associated with many oncologic pathologies. Additionally, general therapeutic approaches is improved by AI, e.g. the drug company ‘Absci’ has released novel drug for cancer treatment based on AI models to create antibodies against the oncogene HER2, connected to certain breast cancers.

Targeted Drug-delivery

Generally speaking, the pharmaceutical industry can easily rely upon an extensive range of AI applications, for designing, developing and testing novel drugs, especially those targeting specific molecular and receptor sites.[26] AI would especially enable targeted drug delivery systems and next generation novel therapeutics by helping designing novel micro and nanoscale systems for drug delivery for personalized medicine: this is also valid for 3D cell and organ printing, tissue engineering and gene therapy within the regenerative medicine domain. Advanced nanotechnological systems based on AI principles are designed and developed, such as nanobots and nanomachines, to address needs and specificities in drug design and testing[27]. In fact, therapeutic drugs targeting various common diseases are simultaneously addressing others which are quite tough to treat and widespread, such as cancer and immune syndromes: these last are generally very expensive and involve harmful side effects.



In this light, as an example, the use of non-standard peptides sounds particularly promising as a new personalized approach to develop drugs with limited side effects. However, producing these peptides artificially is a tough task. AI can support the development of ground-breaking and even revolutionary peptide discovery system enabling man-made generation of millions of different non-standard peptides, for narrowing them down to few candidates for designing and developing novel drugs in short time. In fact, supported by powerful data processing and dedicated algorithms, AI enables a random combination technology on these constituents, creating millions of different kinds of non-standard peptides in one single test spot: then, appropriate candidate peptides are searched, analyzed, and identified at very high speed, thus reducing time and costs, thus supplying lead compounds for novel drug design before the preclinical phase[28].

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[26] Raza, M.A. et al. (2022). AI in pharmacy : overview of innovations. Artificial Intelligence (AI) in Pharmacy: An Overview of Innovations - PMC (nih.gov), in Innov Pharm. 2022; 13(2): 10.24926/iip.v13i2.4839.

[27] Philip A., et al. (Eds.) 2023. *A Handbook of Artificial Intelligence in Drug Delivery*; Editors: Anil Philip, Aliasgar Shahiwala, Mamoon Rashid, Md Faiyazuddin, ELSEVIER, Paperback ISBN: 9780323899253.

[28] JapanGov, 2023. *A new approach to drug discovery*, https://www.japan.go.jp/technology/innovation/drugdiscovery.html

However, among key breakthroughs, it is protein folding and prediction the most plausible AI-supported innovation which takes the lion's share among the prospective ground-breaking innovations in targeted drug delivery. However, its immense potentialities could be extended to a vast range of application fields, among them regenerative medicine, whose efficacy is expected to be achieved in both cell and gene therapies[29].

In fact, diverse are the many AI-based digital applications to nano-bio-pharma technologies: among them, AI may be used to automating the discovery of new pharmacological compounds and protein folding, or to assisting in clinical decision-making related to, e.g., the diagnosis of cancer, COVID-19 or tuberculosis in radiological tests. Among cutting-edge AI developments in nano-bio-pharma technologies, some novel developments are particularly inspiring and forward-looking: among them, accurate protein structure prediction has been recently achieved by 'Alphafold' and 'RoseTTAFold' systems.

Beyond the legitimate *Nature* enthusiasm raised by this discovery and achievements, also media sensational headlines (e.g., BBC) recently underlined that pioneering AI companies recently achieved to solve one of biology's thorniest mysteries. *Forbes* also declared it the most important ever demonstrated AI achievement, which is dedicated to predicting the functional 3D folded structure of a protein molecule from its linear amino-acid sequence. This paves the way to both scientific breakthrough and trailblazing innovations in different fields, especially in personalized medicine and the healthcare sector.[30]

[29] Reworked from: (i) Eisenstein, Michael, (2021) "AI deeps powers protein folding prediction", *Nature*, https://www.nature.com/articles/d41586-021-03499-y; (ii) Jumper John *et al*. (2021) Highly accurate protein structure prediction with AlphaFold, in *Nature* open access, https://www.nature.com/articles/s41586-021-03819-2

[30] FORBES (2023) *Five predictions about AI for the near future* (Author: Gaurav Tewari), Forbes Business Council, at: https://www.forbes.com/sites/forbesbusinesscouncil/2023/02/28/five-artificial-intelligence-predictions-for-the-near-future/?sh=29036f7e5f18

It is interesting to hypothesize, infer, and outline the practical upshots of this achievements: proteins are the bricks of life: their production is governed by DNA thru combinations of its four bases, using amino acids in cells to compose enormous variations of 3D shapes and folds; these last determine all functions in life, from how a disease is developing, to how cells grow up in a tree, or how humans and other living beings think, breath and digest. The underlying physicochemical mechanisms and rules governing how proteins form their 3D structures – and thus express their biological functions – remain extremely complicated for humans to comprehend, so this 'protein-folding problem' has remained unsolved for decades. In fact, identifying all possible 3D structures of one single protein – which means to screen all its potential functions- may take 14 billion years with conventional tools. In addition to that, about 200 million proteins are present in nature, at least.[31]

Recently, the combination of various innovative deep learning techniques carried out by the above-mentioned cutting-edge systems (i.e. 'AlphaFold' and 'RoseTTAFold'), combined with neural networks, produced AI systems able to disclose in a few minutes all possible folding and shapes of the vast majority of this terrific proteins' amount: thus, enabling identifying and characterizing their main functions. One of the leading companies was situated in the Google orbit (i.e., 'AlphaFold'), quite cagey in disclosing info; however, labs from academic competitors have recently been able to catch up and develop open science systems (i.e: 'RoseTTAFold'), being especially prone to develop innovative biomedical applications, among others.[32]

On the top of that, these innovations open the floor to conceive, design and develop proteins that never existed in nature, whose functions are tailor-made, designed '*à la carte'* to address and solve a wide panoply of issues and pathologies, e.g., fighting pulmonary fibrosis, nasal spray to combat flue variants, and even beyond healthcare, such as diverse potential side applications to generate energy, and degenerate plastics, among others. This research based outside the EU, so policies promoting research and innovation in an analogous direction could be beneficial for science and research systems, possibly leading to advance EU industries and benefitting EU society at large.

[31] Reworked from: (i) Jumper John *et al*. (2021) "Highly accurate protein structure prediction with AlphaFold", *Nature* open access, https://www.nature.com/articles/s41586-021-03819-2 (ii) *AI for nanotechnology, AI for nanobiotechnology*: Eds; Silvia Faré, Sorin Melinte, Adriele Prina-Mello (2023) https://www.frontiersin.org/research-topics/31068/ai-for-nanobiotechnology

[32] *Ibidem* (i).

Overall, regenerative medicine includes gene therapies, cell therapies, and tissue-engineered products devoted to augmenting, repairing, replacing, or regenerating parts or organs, tissues, cells, genes, and metabolic processes in the body. So, regenerative medicine currently embraces a set of technologies which can offer terrific promise for improved and enhanced patient treatment and quicker recovery. However, these disciplines suffer from dodges such as trial and error steps, production inefficiency, time- and effort-consuming processes, often hindered by human errors. AI-supported systems, together with automation and robotic devices, could provide significant advances in this prospect, e.g., prediction of tissue engineering results with artificial neural network, robot-based rapid prototyping for scaffolding, deep learning assistance to musculoskeletal applications, automated cell processing robotics and computational-based neural networks for achieving complex tissue engineering applications.[33]

Overall, stem cell-derived strategies for regenerative medicine are composed to cure some of the toughest diseases, including Parkinson's, diabetes, and various heart diseases. Therefore, patient-specific cells can provide the safest, most effective therapies, especially pluripotent stem cells. However, current autologous step-in processes are not easily scalable due to time- and effort consuming manual handling, vast variability, and expensive facility use. More specifically, regenerative medicine using induced pluripotent stem cells promises novel ways

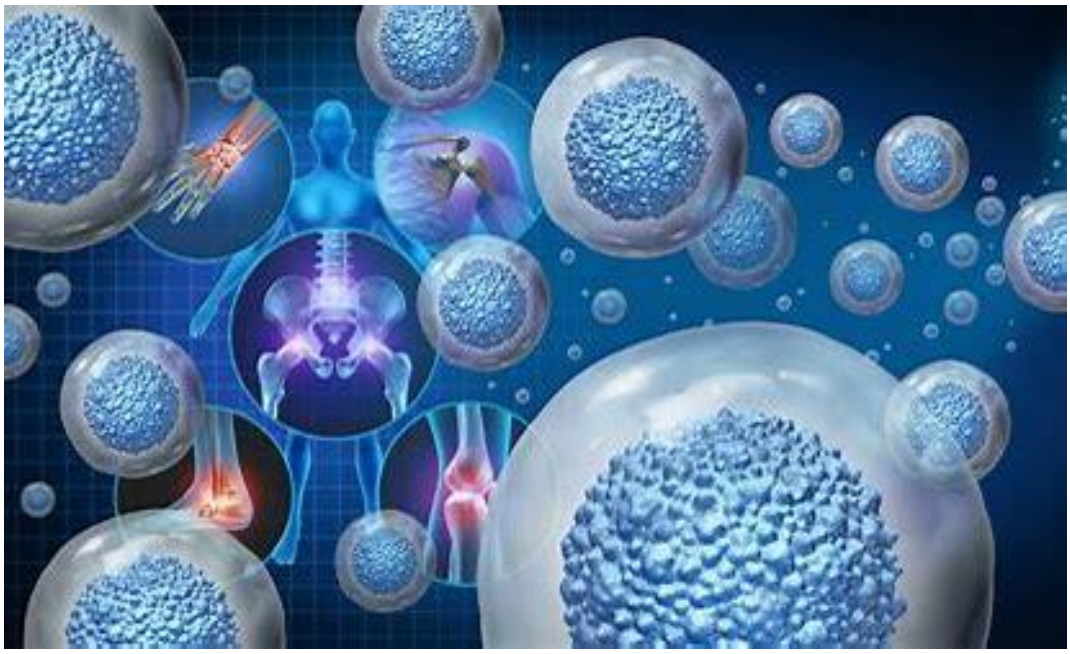
[33] Suraj, K. et al., 2013. *AI in advancement of regenerative medicine and tissue engineering*, DOI: 10.13140/2.1.4238.6888, Conference: 2nd International Conference on Tissue Engineering and Regenerative Medicine(ICTERM) 2013, At: National Institute of Technology, Rourkela, https://www.researchgate.net/publication/262914601_Artificial_Intelligence_in_advancement_of_Regenerative_medicine_Tissue_Engineering#:~:text=Some%20of%20the%20important%20applications,regenerative%20medicine%20such%20as%20in

to treat particularly tough illnesses. For reaching high standards, extensive research is currently underway to use AI-supported systems to produce high-quality and standardized pluripotent stem cells: this is vowed to ensure quality of mass-produced transplantable cells and to facilitate their transplantation to wider scale, leading to custom-made and personalized regenerative treatment for each patient at quite affordable costs. Thus, AI could enable personalized regenerative medicine to become more viable at larger scale[34].

In this light, among the most promising application prospects in regenerative medicine, current AI-based regenerative medicine research addresses pluripotent stem cells to improve vision. The process starts by preparing special cellular sheets and transplanting them in diseased retinas, grown from healthy pluripotent stem cells generated from the patients' own cells. The surgery involves removal of the problematic cells and then transplanting the sheet of healthy cells in their place: AI-supported co-bots will master the skills of most experienced researchers thru deep learning, thus learning and becoming proficient in preparing high-quality cells just like the best researchers do. Last, this lesson learned by one co-bot can be copied to others.[35]

[34] AI for Good, (2022). *AI and regenerative medicine: AI-enabled manufacturing of stem-cell based therapies* https://aiforgood.itu.int/event/ai-and-regenerative-medicine-ai-enabled-manufacturing-of-stem-cell-based-therapies/

[35] JapanGov, 2023. *AI to advance regenerative medicine,* https://www.japan.go.jp/technology/innovation/aitoadvance.html



From the business perspective, a non-exhaustive selection is carried out to present a set of promising and leading AI key companies quite active in conceiving, designing, and developing novel possibilities for AI application in key cutting-edge research and innovation for medicine and healthcare. This selection is showing how AI can generate new business models therein, therefore fueling the growth of new business and organization models. Most are in the US, EU, AS and Japan. So, assessing the potential of AI is key to differentiate their potentialities to identify, explore and exploit novel business prospects in the main branches of healthcare industries, a non-exhaustive selection is provided and analyzed.

DIAGNOSTICS

Paige: AI-supported system transforming the way pathologists work.
Grail: AI-supported early detection systems for cancer.
Empatica: AI-based health monitoring platform.
AliveCor: AI-supported systems and devices for enabling precision diagnostics for cardio-vascular pathologies.
Imagia: AI-supported clinical systems to detect and predict cancer-driven changes.
Butterfly: setting up AI-supported devices enabling medical imaging world-accessible.
Bay labs: driving AI-driven deep learning advances to key unsolved issues in healthcare.
Zebra: designing AI algorithms to assist radiologists in detecting under-looked or underestimated symptoms and indications.
Behold: design and develop AI-driven medical imaging record platform to process medical images.
Advenio: combining AI, deep learning and machine learning-based computer-assisted detection for diagnostic clinical imaging.
Sig tuple: designing personalized screening solutions to aid diagnosis thru AI-powered analysis of visual medical data.

THERAGNOSTICS

Medtronic: engineering AI-supported innovation to develop treatments for diverse pathological and clinical settings.
Absci: creating new drugs at the AI speed.
MedyMatch: boosting AI-based diagnostics accuracy to prevent chronic conditions and improve patient outcomes providing the right therapeutic treatment at the proper time.
Enlitic: developing AI-based deep learning to identify and distil actionable insights from billions of clinical cases.
Mindshare: developing AI-supported precision medicine thru image-driven intelligence.
Lunit: developing advanced AI-based software for medical data collection, analysis, assessment and interpretation via cutting-edge AI-supported deep learning technology.

TARGETED DRUG DELIVERY

Insilico Medicine: designing AI systems for targeted drug discovery, biomarker development addressing aging research.
Atomwise: AI-driven deep learning technology to design novel extra small molecule with outstanding speed, accuracy, and diversity.
Peptidream: revolutionizing drug discovery by designing new peptides thru AI-supported systems.

REGENERATIVE MEDICINE


Source: SMARTHAND project[36]

Deep genomics: predicting the molecular effects of genetic variation thru AI-based systems to advance in anticipating reconstructive molecular designs.
Ome Care (former Pathway Genomics): global medical genomic diagnostics systems merging AI and deep learning within precision medicine, to advance in regenerating molecular as well as protein folding models and regenerative patterns.
DeepMind: AI-based systems for solving intelligence to advance science and benefit human-centricity towards reconstructive molecular, protein, cell, and tissue regenerative designs.
Alphafold: designing tailor-made protein structures to tailor-make molecular as well as protein folding reconstructive patterns.
Riken: international research hub, fostering AI to advance in regenerative medicine;
RoseTTAFold, accurate AI-based prediction systems for protein folding and interaction to target and deliver molecular, cell and tissue reconstructive patterns thru protein folding patterns.

Concluding, discussing the described potential of AI for augmenting medicine developments and their application into key healthcare branches is pivotal to outline and assess novel outlooks for AI-augmented medicine and healthcare associated sciences, research, innovation, and related industries. This enables also analyzing and differentiating the associated innovative industrial prospects: exploring the proper conditions fostering the appropriate AI embedment in this science field is the next step claiming for policy actions, also helping to sketch out some relevant policy lookouts, insights, and foresights.

[36] SMARTHAND project, The smart Bio-adaptive Hand prosthesis | SMARTHAND | Project | Fact sheet | FP6 | CORDIS | European Commission (europa.eu)

AI-enabled sustainable environment and energy: innovation outcomes

From a global standpoint, the analysis of the selected projects spotted some prominent innovation outcomes already achieved, although it is possible also to outline a wide panoply of expected potentialities surpassing them. The most promising and crucial AI-related innovation outcomes stemming from selected projects are already operating, showing how well and to what extent they have the potential to significantly impact both the environment and energy sectors.

- **Energy Efficiency Modeling and Implementation**: several projects indicated to what extent AI algorithms can analyze vast amounts of sensor data either from machinery and equipment or optimizing overall production schedules. This enabled to optimize energy consumption in various industries and sectors. For example, in manufacturing, AI-powered systems can analyze production processes and identify areas where energy usage can be reduced without compromising efficiency.
- **Smart Grids Optimization**: some projects demonstrated to what extent AI-powered systems and generally several AI technologies can enhance the efficiency and reliability of energy distribution through smart grids. These can identify defects or anomalies by analyzing diverse sources providing images and data from sensors or signals, enabling to keep high-quality standards. In fact, these grids use AI algorithms to analyze data from sensors and meters to optimize energy distribution, predict demand, and manage renewable energy sources more effectively. This finally results into higher efficiency levels, performing processes and procedures in the best possible way, increasing efficacy of the whole production processes, and simultaneously cutting waste and energy costs.
- **Renewable Energy Integration**: some projects illustrated how AI-powered systems and technologies can improve the integration of renewable energy sources such as solar and wind power into the existing energy grid. In fact, AI algorithms can forecast renewable energy production based on weather patterns and adjust energy distribution accordingly. This finally impacts into higher efficiency levels and gains, performing processes and procedures in the best possible way, increasing efficacy of the whole production processes, and simultaneously cutting waste and energy costs.
- **Energy Storage Optimization**: few projects showed how AI-enabled systems and technologies can provide algorithms which can optimize energy storage systems, such as batteries, by predicting energy demand and optimizing charging and discharging cycles. As a result, this helps to maximize the utilization of renewable energy sources and simultaneously improve grid stability.

- **Environmental Monitoring and Protection Optimization**: most projects demonstrated to what extent AI-powered systems and technologies are capable to evaluate, analyze and assess large volumes of data from satellites, sensors, and other sources to monitor environmental changes, track deforestation, analyze air and water quality, and detect environmental hazards. This finally helps to maximize the utilization of renewable environmental resources and thus improve sustainability patterns.
- **Climate Modeling and Prediction Models Optimization**: most projects showed to what extent AI-powered systems and technologies are capable to assess large volumes of data sources to monitor environmental changes, track deforestation, analyze air and water quality, and detect environmental hazards. In this light, AI techniques, such as machine and deep learning, can improve climate modeling and prediction accuracy: by analyzing historical climate data and incorporating real-time observations, AI models can help scientists better understand climate patterns and predict future changes. This finally helps to maximize both the monitoring and use of environmental resources therefore improving sustainability.
- **Natural Resource Management Optimization**: most projects demonstrated to what extent AI-powered systems and technologies are becoming capable to assess large volumes of data sources to efficiently manage environmental resources. Doing so, AI-powered technologies can assist in sustainable natural resource management by analyzing data on land use, biodiversity, and ecosystem health. This information can help sustainability operators as well as policymakers making informed decisions to protect and protect natural resources.
- **Smart Buildings and Cities**: a few projects illustrated how well AI-powered systems and technologies perform in assessing huge volumes of data sources: this enables managing and optimizing energy usage in buildings and cities by controlling heating, ventilation, and air conditioning (HVAC) systems, lighting, and other utilities based on occupancy patterns, weather conditions, and energy prices. Finally, this can help city planners and operators, as well as policymakers, in taking well-grounded decisions to optimize smart cities' sustainability.

From all these considerations it is clear to what extent the integration of AI technologies applied in both the environment and energy sectors holds great potential for improving sustainability, by optimizing efficiency, reducing environmental impact, and advancing general sustainability efforts. However, it's essential to simultaneously address challenges such as the associated management of relevant data privacy, security, and ethical concerns to ensure that AI deployment benefits both society and the environment.

AI-enabled sustainable environment and energy: science breakthroughs and research prospects

Overall, AI is playing an increasingly significant role in advancing sustainable development across various domains. Stemming from the analysis of the selected projects, here are the main science breakthroughs and research prospects where AI is making a notable impact.

- **Environmental Monitoring and Pollution Control**: here AI-powered sensors and monitoring devices enable real-time tracking of air and water quality, detecting pollution sources, and assessing environmental risks. These AI-powered scientific breakthroughs enable to develop sets of technologies which are helping knowledgeable authorities take proactive measures to mitigate pollution and protect public health and the environment.
- **Natural Disaster Response and Resilience**: here AI-powered systems structure predictive analytics and risk assessment tools which can help communities better prepare for and respond to natural disasters such as hurricanes, earthquakes, floods, and wildfires. By analyzing historical data and environmental factors, AI-powered scientific breakthroughs can shape algorithms able to forecast disaster events, assess vulnerability, and optimize emergency response efforts to minimize loss of life and property damage.
- **Smart Agriculture and Farming**: here AI-powered algorithms are enabling precision agriculture techniques to help farmers optimize crop yields and farming practices while minimizing resource use and

environmental impact. AI-powered scientific breakthroughs model are functioning very well thanks to sensors, drones, and satellite imagery collecting data on soil conditions, as well as weather patterns and crop health, which AI algorithms analyze to provide insights and recommendations for more sustainable farming practices.

- **Circular Economy and Waste Management**: here AI-powered algorithms are utilized to improve waste management processes and promote a circular economy. AI-powered scientific breakthroughs such as machine learning algorithms can optimize waste sorting and recycling processes, identify opportunities for waste reduction and recycling, and even predict future waste generation trends to enable better planning and resource allocation.
- **Climate Modeling and Prediction**: here key AI algorithms are being used to analyze vast amounts of climate data and improve the accuracy of climate models. These scientific model breakthroughs help in predicting extreme weather events, understanding climate change patterns, and assessing their impact on ecosystems and human societies.
- **Renewable Energy Optimization**: here AI-powered algorithms and AI techniques such as machine learning and optimization algorithms are being applied to improve the efficiency of renewable energy systems. For instance, AI can optimize the operation of wind farms, solar panel placement, and energy storage to maximize energy production while minimizing costs and environmental impact.
- **Resource Management and Conservation**: here AI-powered tools are being used to monitor and manage natural resources more effectively. For instance, satellite imagery and machine learning algorithms can track deforestation, monitor wildlife populations, and identify illegal fishing activities. These scientific model breakthroughs shape most information needed to enable policymakers and conservationists to take proper and timely actions to protect ecosystems and biodiversity.
- **Urban Planning and Urban Transportation**: here AI-powered systems and AI-supported technologies are revolutionizing both urban planning and transportation systems to make cities more sustainable and livable. AI-powered scientific breakthroughs can enable smart traffic management systems by using AI algorithms to optimize traffic flow, reduce congestion, and minimize fuel consumption and emissions. Additionally, AI-driven urban planning tools help design more efficient and environmentally friendly cities by considering factors such as energy use, air quality, and green space.

In this light, AI holds great promise for advancing sustainable development by providing innovative solutions to complex environmental challenges and empowering decision-makers with actionable insights to build a more resilient and sustainable future. Further research and collaboration across diverse sciences,

exact, social, and technological disciplines are essential to harness the full potential of AI in addressing sustainability issues and creating positive environmental outcomes, to fully exploit the achieved pioneering science breakthroughs.

Reworked by the author from: https://openart.ai/create

In this light, also strengthening international cooperation and coordination is an utmost need to guarantee that AI innovation potential could improve simultaneously sustainability, people wellbeing and quality of life in diverse application fields, in a fully human-centric perspective: for instance, by addressing AI espousal simultaneously into sustainability education, safety, ultimately impacting onto global health and professional-life balance. On the one hand, too restrictive policies might jeopardize the development and embedding of AI into production and consumption patterns, therefore constraining the associated societal advantages. On the other hand, far-sighted policies should foster a human-centered balanced approach for promoting AI-related benefits for society, economy, industry, sustainability, politics, and culture, by guaranteeing the proper management of their associated risks.

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AI-enabled ICT, Mobility and Security: innovation outcomes

Overall, AI is playing an expanding role in advancing ICT (Information and Communication Technology), Mobility and Security, also towards and across their related fallout domains, which could be ground-breaking. Resulting from the analysis of the selected projects, the main innovation outcomes are illustrated, analyzed, and detailed, confirming how far AI is making a prominent impact therein. Also, AI-enabled ICT Mobility, and Security are pivotal in driving innovation outcomes across various other sectors, showing, illustrating, and demonstrating to what extent these AI-enabled technologies contribute to innovation in many other domains, sometimes far reaching.

- **Generative AI** systems are machine-learning models which are already a moving frontier within AI-driven ICT systems: fundamentally, generative models are probability density models, as they captures the probability distribution of the data, shaped by humans in the way of inductive biases, explicitly known or not.[37] Generative models can be used to score unseen data samples to see whether they may belong in the set of training data or not. So, learned representations can be evicted from them, which can themselves produce novel scientific insights, or become useful for developing downstream computational tasks. However, there is an inner limitation in generating new data from these systems: in fact, producing new data from a generative model cannot feed back into the same model with the same learning objective, so to build a perpetual motion machine. For building a viable data-generating procedure, any cycle must induce feedback by injecting new information in it, such as filtering those generated data with an external procedure, human or machine based. Combining different AI models together, i.e., ensemble learning, can be an almost powerful strategy, especially when models differ sufficiently well in their predictions. In this light, new data samples can be deduced from generative AI models, although both themselves and their extracted representations cover only the raw information used to train those models beforehand. So, on the one hand AI-generative systems can empower a new generation of incredibly useful literature synthesis tools e.g., providing biomedical diagnosis and beyond. On the other hand, they will not themselves become virtual scientists. In fact, AI-generated models, tools, and systems can manage to understand the collected data, and to extract from them generalized and reasoned lookouts, insights, and foresights, also contributing to decide what to measure, initially or iteratively. However,

[37] Listgarten, J. (2024): "The perpetual motion machine of AI-generated data and the distraction of ChatGPT as a 'scientist' ", in *Nature Biotechnology, Correspondence*, January 2024, at: Listgarten-2024-Nature_Biotechnology.pdf (cec.eu.int)

they should be monitored, reasoned, and interpreted by humans to display their full usefulness. In this sense, the discussion on the currently accepted classification of generative AI systems is particularly enlightening: in fact, they are currently classified in four primary AI types[38], identified as the main AI-powered innovation outcomes impacting on a vast range of sciences, technologies, innovation and disciplines, i.e., (i) *reactive machines*, which are task-specific, taking customer data and preferences to deliver recommendations, e.g. artificial chess players based on machine learning; (ii) *limited memory* imitates brains' neurons working together, getting smarter by receiving more data to train on, e.g. self-driving cars; (iii) *theory of mind* aims at understanding how other entities experience thoughts and emotions, behaving accordingly, mimicking humans in understanding intentions and predicting behaviors; (iv) *self-awareness* aims at shaping a sense of self, i.e. a conscious understanding of their existence and their state of being. The last two types do not fully exist yet, although some AI-supported systems aspire to understand emotions, sensing or predicting human feelings and behaviors.

- **Optimized ICT supply and services**: most projects demonstrated to what extent AI-powered systems and technologies are capable to maximize the integration of AI into ICT infrastructures, which enhances their efficiency, accuracy, and decision-making processes. It enables predictive analytics, personalized services, and automation across diverse domains ranging from healthcare, to finance, manufacturing, and even education. Finally, this resulted into showing how well AI-driven ICT fosters innovation by enabling the development of assisting systems, smart applications, and advanced data analytics platforms that transform how businesses operate and interact with users.
- **Optimized Mobility**: several projects showed to what extent AI-powered systems and technologies are capable to optimize mobility solutions, seamless connectivity, accessibility, and user experience. AI algorithms can optimize route planning, traffic management, and transportation logistics, leading to reduced congestion, lower emissions, and improved urban mobility. Moreover, AI-driven mobility solutions enable the development of autonomous vehicles, smart transportation networks, and innovative mobility-as-a-service (MaaS) models, fostering innovation in transportation and urban planning. Finally, this resulted into showing how well AI-driven innovations help optimize overall mobility patterns.
- **Optimized Security**: several projects demonstrated how AI-driven security solutions play a critical role in safeguarding digital assets, networks, and critical infrastructure from cyber threats and attacks. Machine learning and deep learning algorithms analyze vast datasets to detect anomalies, identify vulnerabilities, and mitigate security risks in

[38] Coursera (2023). *Four types of AI*, https://www.coursera.org/articles/types-of-ai

real-time. AI-enabled security technologies enhance threat intelligence, incident response, and security posture across industries, enabling organizations to adapt to evolving cyber threats and protect sensitive information effectively. Finally, this is showing how well AI-driven innovations optimize overall security models.

- **Enhanced Resource Efficiency**: some projects showed how AI-driven algorithms streamline processes, automate repetitive tasks, and optimize resource allocation, leading to improved operational efficiency and productivity gains. Finally, this is illustrating how well AI-driven innovations optimize and enhance the overall efficiency balance.
- **Improved User Experience**: some projects illustrated to what extent AI-driven algorithms and AI-powered applications deliver personalized recommendations, intuitive interfaces, and seamless interactions, enhancing user experience and satisfaction across digital platforms and services. Finally, this is corroborating the efficiency of AI-driven innovations in optimizing and personalizing user friendliness, specific and attractiveness.
- **Accelerated Decision-Making**: some projects showed to what extent AI-driven analytics provide actionable workflows able to accelerate the decision-making processes, by optimizing and streamlining the option-selection processes, automating repetitive tasks, and finally boosting the overall decision-making accuracy, efficiency, and outcomes. Finally, this is showing how AI-driven innovations can optimize and personalize decision-making workflows, processes, procedures, and ultimate outcomes.

From these considerations it is clear to what extent the integration of AI technologies holds great potential for improving the ICT, Mobility and Security performance, user-friendliness, personalization, sustainability, by optimizing efficiency and advancing general sustainability efforts. However, it sounds of outmost importance to address challenges such as the management of relevant data privacy, IPR, security, democracy, and ethical concerns to ensure that AI deployment benefits economy, industry, society, sustainability, politics, and culture at large. These reflections evoke to deepen the analysis on which science breakthroughs and research prospects are crucial to attain this objective.

AI-enabled ICT, Mobility and Security: science breakthroughs and research prospects

Overall, AI is playing an increasingly prominent role in advancing ICT, Mobility and Security. Stemming from the analysis of the selected projects, here are the main science breakthroughs and research prospects, where AI is making notable impacts which interconnect and cross-fertilize in numerous and diversified ways.

- **AI-driven Security Solutions**:
    - **Cybersecurity**: here AI and machine learning techniques are being used to enhance cybersecurity systems by detecting anomalies, identifying threats, and strengthening defense mechanisms.
    - **Privacy Protection**: here AI techniques like federated learning enable collaborative model are training without sharing sensitive data, thus preserving privacy in mobility and ICT systems.
    - **Biometric Security**: hare prominent advancements in AI enable more robust biometric authentication systems for securing mobile devices and ICT infrastructure.
- **Optimized Mobility thru AI Integration**:
    - **Autonomous Vehicles**: here AI algorithms power autonomous vehicles, enhancing mobility while also raising concerns about safety and security.
    - **Smart Transportation Systems**: here AI-powered systems can optimize traffic flow, reducing congestion, and improving transportation efficiency through predictive analytics and real-time data processing.
- **Mobile Health (mHealth)**: here AI-powered systems enable mobile health applications for remote patient monitoring, diagnosis, and personalized treatment recommendations.
- **AI-powered Optimization of ICT Infrastructures**:
    - **5G Networks**: here AI-enabled tools can optimize the allocation of resources in 5G networks, improve network efficiency, and empower new services and novel ICT infrastructure applications.
    - **Edge Computing**: here AI algorithms deployed at the edge enhance real-time data processing, reduce latency, and therefore improve overall user experience in mobility and ICT applications.
    - **Cloud Security**: here AI-powered tools are effectively used for threat detection, data encryption, and access control in cloud computing environments, ensuring the security of ICT infrastructure and services.
- **Research on Ethical Considerations**: as AI becomes more pervasive in mobility and ICT systems, growing concerns about data privacy are

rousing, as well as algorithmic bias and ethical implications require utmost attention and specific research. So, key research targeted on governing AI-enabled actions and contents should be pursued to better enable both citizens' privacy protection as well as academic and industrial IPR safety.

- **Research in privacy-preserving AI**: building-on specific capability to explain, illustrate and pursuing fairness in AI-algorithm design is crucial for addressing privacy concerns and building trust in AI-powered systems. In this light, more research is needed on governing AI-enabled contents to protect data privacy.
- **Research on AI-labelling AI-generated contents and literacy**: design, develop, and implement specific capability buildings vowed to label AI-generated contents. This should be essentially aimed at designing AI-powered methods, tools, and systems vowed to discriminate between AI-generated and human-created contents. Namely, they should perform similarly to the aetiologia describing the "*Penelope's syndrome*": during the daytime she was weaving a shroud for his father-in-law Laertes, whereas undoing it during the night: this means to unspin the spun, undoing the woven, delacing the laced, and unravelling the knitted. So, these AI-powered systems should be designed to turn AI-counterfeited contents onto unfaked, thus devoting to spotting, identifying, labelling, and demystifying AI-generated contents. They should become crucial to enable novel models for AI digital literacy, and thus dedicated to empowering ICT consumers, users and lay citizens making informed, aware, conscious, reasoned choices and decisions. This is becoming particularly important, even imperative, to guarantee Intellectual Property Rights and authorship protection by identifying, discouraging, and combating plagiarism. Last, this is also ultimately devoted to avoiding manipulation of ICT consumers, users, communities, and lay citizens, which might be AI-induced by: (i) reiteration of alluring sensorial stimuli; (ii) intellectual brainwashing; (iii) emotional maneuvering; (iv) influence of rewarding mechanisms; (v) reinforcing acritical assumptions, e.g., ideological integralism; (vi) abusing persuasion techniques; (vii) mystifying and bamboozling the political debates, processes and equilibria. In fact, all this could jeopardize democratic processes, systems, and even governance. Clearly, novel, ground-breaking, and pioneering AI-relevant digital literacy models are of utmost importance therein, at both educational and informational levels, by targeting youngsters, communities, and lay citizens. In fact, novel models for AI digital literacy could lead towards building and achieving reasoned trustworthiness of AI-generated data and contents, which is crucial for AI acceptance and governance.
- **Human-Computer Interaction**:
    - **AI Advancements in Natural Language** processing, gesture recognition, and emotion detection: here AI-powered systems are

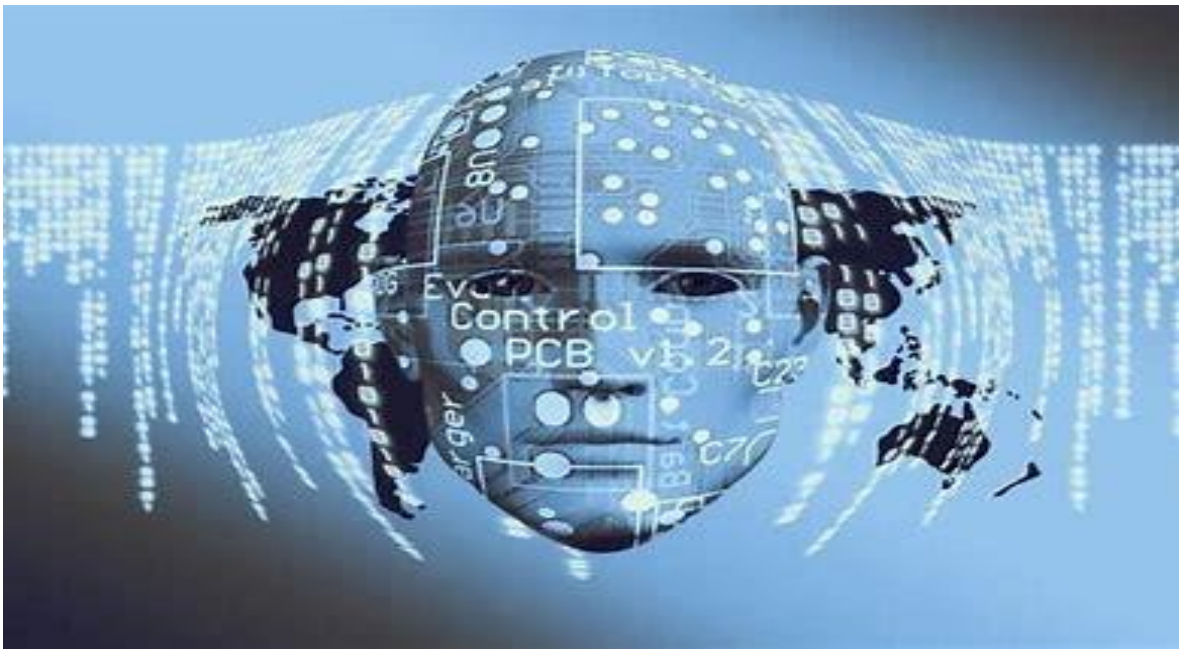
enhancing user interaction and experience in mobile and ICT applications.

- **AI-powered Research in Human-Computer Interaction**: here AI-enabled systems focus on designing intuitive interfaces, adaptive systems, and personalized experiences tailored to individual user preferences and behaviors.

So, AI-enabled science breakthroughs and research prospects in ICT, Mobility, and Security are closely intertwined, driving innovation, and shaping the future of most ICT-enabled services and applications. Addressing challenges related to privacy, security, and ethical considerations is essential for consciously achieving the full responsible potential of AI in mobility, security, and the entire ICT ecosystem.

Overall, key AI-enabled science breakthroughs in ICT, Mobility and Security are demonstrating how well novel research prospects could impact onto economy, industry, society, sustainability, politics, and culture in a profound and possibly irreversible way, which could backfire if not properly governed. In this light, specific acumens in EU policies are required to look forward to properly espousing and embedding key AI-enabled ICT science breakthroughs and research prospects in opening the floor to the ethical, legal, social, cultural, and political discussion on the most appropriate ways to do that.

Summarizing, more research is clearly needed on how to manage and govern the enormous AI-enabled potentialities which the quoted crucial science breakthroughs outline in ICT, Mobility and most of all, Security: here developing more targeted research is of utmost importance.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AI-enabled Ethical, Legal and Social disciplines: innovation outcomes

Overall, AI is playing an expanding role in advancing Ethical, Legal and Social disciplines, also across their diverse impacting areas. Resulting from the analysis of the selected projects, the main innovation outcomes are illustrated, analyzed, and detailed, showing to what extent AI is making a prominent impact by making significant contributions and simultaneously offering solutions to complex challenges.

- **Ethical impact in AI Development**: most projects demonstrated to what extent AI-powered systems and technologies are being developed to incorporate ethical considerations directly into their design and decision-making processes. For instance, researchers are working on algorithms that prioritize fairness, transparency, and accountability in their outputs. This resulted into AI models able and trained to detect and mitigate biases in data, helping to reduce the risk of discrimination and unfair treatment in automated decision-making processes.
- **Legal Investigation and Analysis**: some projects showed how AI-powered systems and tools are capable to revolutionize legal research and analysis by automating the process of reviewing and analyzing vast amounts of legal documents, court cases, and precedents. This resulted into higher efficiency, accuracy, and speed in deployment of legal analysis and research.
- **Natural Language Processing**: most projects showed how AI-powered algorithms can enable lawyers and legal professionals to quickly search and extract relevant information from legal texts, saving time and improving the efficiency of legal research. This impacted into attaining higher speed in processing legal information from data bases, optimizing both accuracy and efficiency in deploying legal analysis and research.
- **Social Impact Assessment**: few projects illustrated to what extent AI-enabled tools and algorithms are being used to assess the social impact of policies, programs, and initiatives. These tools can analyze large datasets to identify potential positive or negative consequences on different demographic groups and communities. Thus, AI-powered Social Impact Assessment can ultimately enable policymakers to optimize take informed and fair decisions, and simultaneously help design interventions vowed to promote equity and social justice.
- **Ethical Decision-Making Support**: some projects illustrated how AI-enabled tools are being developed to assist individuals and organizations in making ethical decisions by analyzing complex ethical dilemmas and providing guidance based on ethical principles and values. These systems can help professionals in fields such as healthcare, finance, and business navigate ethical challenges and ensure that their decisions align with ethical standards and regulations. This finally resulted into attaining more

efficient, optimized, and balanced decision-making processes, procedures, and outcomes.

- **Data Security**: few projects illustrated to what extent AI-enabled tools and algorithms play a crucial role in enhancing privacy protection and data security: by detecting and mitigating cybersecurity threats, identifying vulnerabilities in systems, and improving encryption methods, AI-powered solutions can help organizations safeguard sensitive data, comply with data protection regulations, and prevent unauthorized access to confidential information. This finally impact into optimizing privacy and personal identity protection, simultaneously attaining more efficient data security systems.
- **Community Engagement and Empowerment**: few projects illustrated to what extent AI-powered tools enable specific platforms empowering communities and citizens to participate in decision-making processes, voice their concerns, and advocate for their interests. Online forums, chatbots, and social media analytics powered by AI algorithms can enable communities to engage with policymakers, share feedback, and collaborate on solutions to address social, economic, political, moral, ethical, and environmental issues, and even beyond. This finally resulted into optimizing both community and citizens' engagement, debates, dialogues, and empowerment, ultimately attaining and enhancing protection of the related democratic processes and outcomes.

These demonstrates the diverse ways in which AI is being leveraged to advance ethical, legal, and social objectives, while also highlighting the importance of responsible AI development and deployment to mitigate potential risks and challenges.

In fact, it is not an easy task to attribute responsibilities in AI-systems, as it is neither a straight nor an easy question: it sounds quite unrealistic to predict all the vast range of moral and ethical issues which might raise in the forthcoming years by the enormous potentialities lying in the bigger and quicker data processing abilities shown and powered by AI, together with their augmented anticipation skills. This is expected to become tougher in case humans are becoming no longer capable to display their full control over the AI-based systems,[39] so responsibilities and liabilities should become difficult to distribute across the whole AI-system supply chain.[40]

Because of that, the uncertainty in the prediction and control of some AI-based systems as well as the gap in the attribution of responsibilities between designers,

[39] Heinriks, Jan-Hendrik (2022). "Responsibility assignment won't solve the moral issues of AI", Springer *Link*, https://link.springer.com/article/10.1007/s43681-022-00133-z

[40] Matthias, A. (2004). "The responsibility gap: ascribing responsibility for the actions of learning automata." Ethics Inf. Technol. **6**(3), 175–183 (2004). https://doi.org/10.1007/s10676-004-3422-1

developers, validators, and users is likely to arise[41]. This gap might become difficult to bridge using the conventional notion of responsibility[42], so AI companies should commit to redesigning the whole business models to allow a more thoughtful prediction or at least suitable retrodiction and remodulation patterns for the AI-powered systems behaviors[43].

These principles apply to the currently classified four primary AI types[44], identified as the main AI-powered innovation outcomes impacting on Ethical, Legal and Social disciplines, i.e., (i) *reactive machines*, essentially task-specific tools, taking customer data and preferences to deliver recommendations, e.g., machine-based players relying on machine learning; (ii) *limited memory* mimicking brains' neurons working together, becoming smarter by iteratively receiving more data to train on, e.g., self-driving cars; (iii) *theory of mind* aims at understanding how other entities experience thoughts and emotions, behaving accordingly, thus mimicking humans in understanding intentions and predicting behaviors; (iv) *self-awareness* aims at shaping a sense of self, i.e., a conscious understanding of their existence and their state of being. The last two types are not fully developed yet, albeit some AI-supported systems tend to aspire understanding and recreating emotions, experiencing, sensing, or even predicting human feelings and behaviors. While the first two types are usually interpreted as mere tools, i.e., morally-free as 'pseudo-agents', the remaining two types open questions of the appropriateness to consider them as moral and social 'agents', characterized by some moral consistence. This debate roots on the discussion about the principle of responsibility of AI-based systems, which ultimately implies both moral and legal liabilities.

This discussion is essential for designing and developing responsible and ethically sound primary AI types, involving decisions that might become profoundly controversial. On the one hand, holding humans responsible for actions of IA-governed machines over which they have insufficient control raises the issue of the 'responsibility gap', in both moral practice and legislation.[45] This applies essentially to the first two AI types (i.e. reactive and limited memory) interpreted as tools, so they are not glossed neither as moral nor as social

[41] Sparrow, R. (2007): "Killer robots". J. Appl. Philos. **24**(1), 62–77 (2007). https://doi.org/10.1111/j.1468-5930.2007.00346.x

[42] *Ibidem*

[43] Reworked from: (i) BS (2016). *British Standard for Robots and robotic devices*, https://www.en-standard.eu/bs-8611-2016-robots-and-robotic-devices-guide-to-the-ethical-design-and-application-of-robots-and-robotic-systems/ ; (ii) BS 8611:2016 (2016) *Robots and robotic devices. Guide to the ethical design and application of robots and robotic systems*, https://www.en-standard.eu/bs-8611-2016-robots-and-robotic-devices-guide-to-the-ethical-design-and-application-of-robots-and-robotic-systems/; (iii) *IEEE Global Initiative for Ethical Considerations in Artificial Intelligence and Autonomous Systems*, p. 90 ff. https://standards.ieee.org/industry-connections/ec/autonomous-systems/

[44] Coursera (2023). *Four types of AI*, https://www.coursera.org/articles/types-of-ai

[45] Reworked from Beck, S. (2016). "The problem of ascribing legal responsibility in the case of robotics". AI Soc. **31**(4), 473–481 (2016). https://doi.org/10.1007/s00146-015-0624-5

interaction partners: as pseudo-agent, they are not subject to moral relations. In this case, the principle of distributed responsibility applies, differentiating and assigning diverse degrees, levels, and types of responsibility to human agents involved in conceiving, designing, developing, and validating AI systems.[46]

However, other AI-powered systems, glossed as generative AI, are reaching limits beyond which humans can no longer understand in detail how artificial systems work, i.e., the 'black box' issue, e.g., unpredictability for neural networks to univocally discriminate among categories. In this case, models inspired to the last two generative AI types, i.e., theory of mind and self-awareness, cannot be fully understood nor predicted by humans in their behaviors. So, some scholars hypothesize that these limited abilities of human beings absolve them from assuming or shouldering a greater share of the responsibility.[47]

Because of that, and as a counterpart, some schools of thought argue that due to their higher anticipation skills and quicker data processing abilities these two generative AI types may deserve being endowed with a certain share of responsibility in man-machine interactions. The underlying principle put forward here is that the more artificial systems surpass humans, the more morally responsible they can become also in social interactions[48]. So, they can be glossed as agents, becoming ascribed in all the moral relations subsumed under the term 'responsibility', which is almost disconcerting. In this latter case, there is no longer any responsibility gap: AI systems are attributed by some scholars as sharing some degree of moral responsibility, whose concept is forcedly stretched[49]. This ascription sounds quite irresponsible to other scholars[50], therefore becoming hazy and blurry, rendering distributed responsibility tough to apply.[51]

On the one hand, attributing the notion of moral and social agent to machines sounds like a sophism, a clever intellectual trap[52]. In fact, this reasoning deliberately disregards the assumption that entities can have moral responsibility

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[46] Nyholm, S. (2018). "Attributing agency to automated systems: reflections on human-robot collaborations and responsibility-loci". Sci. Eng. Ethics **24**(4), 1201–1219 (2018). https://doi.org/10.1007/s11948-017-9943-x

[47] Strasser, A. (2022). "Distributed responsibility in human–machine interactions." *AI Ethics* **2**, 523–532 (2022). *https://doi.org/10.1007/s43681-021-00109-5*

[48] *Ibidem*

[49] Reworked from: Heinriks, Jan-Hendrik (2022). "Responsibility assignment won't solve the moral issues of AI", Springer *Link*, https://link.springer.com/article/10.1007/s43681-022-00133-z

[50] M., (2004): *Sustainable Development: the Need for a New Ethics*, Óleo-LIFE Project LIFE 99/E/ENV/000351, EC DG ENV, Centre for Environmental Strategy of the University of Surrey, Guildford (U.K.) and AEMO, Jaén, Spain, pp. 50, 53-54, and back-cover.

[50] Reworked from: Strasser, A. (2022). "Distributed responsibility in human–machine interactions." *AI Ethics* **2**, 523–532 (2022). https://doi.org/10.1007/s43681-021-00109-5

[51] *Ibidem*

[52] Reworked from: (i) Wallach, W., Allen, C.: ''Moral machines. Contradiction in terms or abdication of human responsibility?'' In: Lin, P., Abney, K., Bekey, G. (eds.) Robot ethics. ''The ethical and social implications of robotics'', pp. 55–68. MIT-Press, Cambridge.

and legal liability only if they are unequivocally endowed with full self-awareness and discernment. By virtue of exerting them, they are capable to distinguish between good and bad, which are anapodeictic ontological categories.

This applies to both ethical and moral, as well as legal, standpoints. AI systems are by-design unable to choose between good and bad, as they simply execute the "black box" of the algorithms which program them to discriminate and choose what is more efficient for them, i.e., between right or wrong, and not between good and bad. So, if a certain AI-powered discernment capability between right or wrong is assumed as apodeictic, its moral acceptability depends on the inmost design of the algorithms which encode them, regardless of the limited human capability to understand or predict their inner dynamics and behaviors.

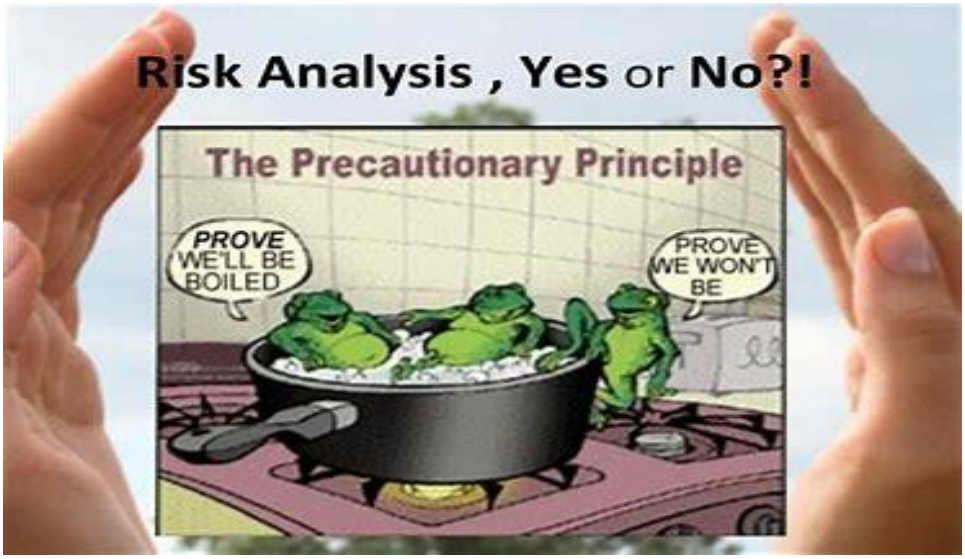
In this light, responsibility relies upon the inner gift humans have, while machines have not. As a matter of fact, unlikely gradualist schools pontify[53], choosing between good and bad is a human prerogative, namely free will, while choosing between what is right or wrong is the best option AI algorithms can do, whose moral suitability and adequacy entirely depend on their internal design. Additionally, in case powerful algorithms supporting AI systems are equipped with or shape by themselves inappropriate objectives, they would produce harmful outcomes: therein, human discernment should apply to the appropriateness or not of their objectives.

In fact, it is not clear yet whether AI systems might be creating their own internal goals by mimicking humans, whose operational dynamics are largely unpredictable: very powerful algorithms instructed by inappropriate objectives could end up by producing the worst outcomes. For instance, in generative AI, it might be possible that AI systems could produce their own objectives by imitating especially human learning patterns, e.g., Large Language Models. This issue has been recently pinpointed to the scientific and political arena in 2023 by an open letter signed by scholars and scientists, who ask for a responsible pausing of AI experiments. The rationale is that the breakneck rush of AI experiments is likely to threaten human life and the entire societal discourse[54]. This is exactly the dilemma framed by the "black-box" issue: according to this viewpoint, as it is not clear yet whether and to what extent selected AI-supported systems might generate their own internal goals to pursue, so the stemming inner dynamics and

[53] Reworked from: (i) Coeckelbergh, M.: "Artificial intelligence, responsibility attribution, and a relational justification of explainability". Sci Eng Ethics (2020). https://doi.org/10.1007/s11948-019-00146-8; (ii) Himma, K.E.: "Artificial agency, consciousness, and the criteria for moral agency: what properties must an artificial agent have to be a moral agent?" Ethics Inf Technol (2009). https://doi.org/10.1007/s10676-008-9167-5

[54] Future of Life Institute (2023). *Pause giant AI experiments: an Open Letter*, https://futureoflife.org/open-letter/pause-giant-ai-experiments/

operational patterns cannot be fully known nor predicted. In this sense, the precautionary principle should apply[55].



Heedless that vision, creating another etymon for responsibility would be needed to embrace – although disturbing – another innovative outcome lying in the conceptual construal of '**moral machines'**.[56] In fact, by emptying the concept of responsibility of its moral and ethical contents, it clashes with the notion of responsibility itself, as moral machines cannot neither ethically, nor morally, nor legally be liable of their choices and acts: quite bewildering and perturbing indeed.

Despite the mental convolutions put forward by late epigons of empiricism, reductionism, and gradualism, it is common sense that AI will never get a heart, nor anything comparable to human conscience, which is the man's ultimate moral and ethical compass.[57]

[55] Reworked from: (i) Future of Life Institute (2023). *The AI Act*, https://artificialintelligenceact.eu/about/ ; (ii) Bonazzi, M., (2004): *Sustainable Development: the Need for a New Ethics*, pp. 53-54 and back cover. Óleo-LIFE Project LIFE 99/E/ENV/000351, EC DG ENV, Centre for Environmental Strategy of the University of Surrey, Guildford (U.K.) and AEMO, Jaén, Spain; (iii) OECD (2023): "What's next? And after that?" presentation by Prof. Stuart Russell, Berkeley University. *International conference on AI in Work, Innnovation, Productivity, Skills*. https://www.oecd-events.org/ai-wips-2023/onlinesession/445db455-0cb9-ed11-994c-000d3a469307;

[56] Reworked from (i) Wallach, W., Allen, C. (2012): ''Moral machines. Contradiction in terms or abdication of human responsibility?'' In: Lin, P., Abney, K., Bekey, G. (eds.) Robot ethics. ''The ethical and social implications of robotics'', pp. 55–68. MIT-Press, Cambridge (2012); (ii) Wallach, W., Allen, C.: *Moral machines: teaching robots right from wrong*. Oxford University Press, Oxford (2009).

[57] Reworked from (a): CERC, Catholic Education Research Center (2017): Father Robert McTeigue, SJ (2017): "Conscience is our constant companion, leading us to Heaven or Hell." *Aleteia* (May 31, 2017) at: Conscience is our constant companion, leading us to Heaven or Hell (catholiceducation.org). (b) Stone, I. and Stone J. (Eds.) (1995): Quote from Vincent's letter to Theo, from Amsterdam, 30 May 1877; *Dear Theo: the Autobiography of Vincent Van Gogh*, ed. Irving Stone and Jean Stone (1995), p. 26, ISBN 0452275040', at: Conscience - Wikiquote

AI-enabled Ethical, Legal and Social disciplines: science breakthroughs and research prospects

Overall, AI is becoming increasingly ubiquitous and pervasive in science, research, economy, industry, society, sustainability, politics, and culture at large. Stemming from the analysis of the selected projects, some key science breakthroughs and research prospects are identified, where AI is making notable impacts which interconnect and cross-fertilize in numerous and diverse ways. AI novel potentialities have opened up various new perspective and outlooks in science breakthroughs and research prospects in the Ethical, Legal, and Social disciplines. Here are some key areas, aspects, and issues where AI is making significant impacts, simultaneously raising important associated ethical, legal, and social questions.

- **Privacy Protection and Security**: here AI algorithms require vast amounts of data to train effectively, raising concerns about privacy and data protection. Research in this area focuses on developing techniques for privacy-preserving AI, such as federated learning and differential privacy, to enable AI systems to learn from sensitive data without compromising individual privacy.
- **Algorithmic Bias and Fairness**: here AI-powered systems can inadvertently perpetuate or even exacerbate existing biases present in the data they are trained on. Ethical considerations involve ensuring fairness and accountability in AI systems by identifying and mitigating biases and designing algorithms that treat all individuals fairly.

- **Impacts on Transparency and Explainability**: in this respect many AI models operate as "black boxes," making it difficult to understand how they arrive at their decisions. Differing from explicability – which denotes to the ability to provide an explanation for why a particular decision was made, explainability refers to the ability to understand how a particular decision was made[58]. So, AI-explainability[59] is an active feature of a learning model describing the processes undertaken by the learning model itself, with the intent of *clarifying* the inner work the learning model is carrying out. Clearly, this is related to the notion of either an argument or an explanation involving an interface between the user and the decision-maker. In this light, more research efforts need to be steered and directed toward developing transparent and explainable AI systems to enhance trust, accountability, and the ability to diagnose errors or biases.
- **Novel models for AI literacy leading to AI trustworthiness:** clearly, innovative education and information patterns targeting ICT users and lay citizens are needed. In fact, AI powered tools and systems could lead to manipulation of ICT consumers, users, communities, and lay citizens, by: (i) reiteration of alluring sensorial stimuli; (ii) intellectual brainwashing; (iii) emotional maneuvering; (iv) influence of rewarding mechanisms; (v) reinforcing acritical assumptions, e.g., ideological integralism; (vi) abusing persuasion techniques; (vii) mystifying and bamboozling the political debates, processes, and equilibria. All this could jeopardize democratic processes, systems, and even governance. So, developing novel, ground-breaking, and pioneering digital literacy education models, as well as information patterns, is of utmost need. In fact, they should enable youngsters, ICT users, communities, and lay citizens to discriminate between AI-generated and man-made contents, and in this sense AI labelling could help. In fact, likely conventional digital literacy, AI digital literacy[60] should embrace data, info, visual, media and meta[61] literacies,[62] grounded on three pillars of (i) *critical thinking*, (ii) *media narrative content decoding*, and (iii) *cybersecurity*.[63] So, critical thinking come first, to enable and empower decoding AI-generated contents and narratives, to ultimately attain overarching cybersecurity, including IPR, privacy, data,

[58] (The) Content Authority (2023): "Explicability vs explainability: meaning and differences", *TheContentAuthority.com*, at: Explicability vs Explainability: Meaning And Differences (thecontentauthority.com)
[59] Gandhi, M. (2020): "What is exactly meant by explainability and interpretability of AI?" *Analytics Vidhya*, 15 Feb 2020. at: What exactly is meant by explainability and interpretability of AI? | by Meet Gandhi | Analytics Vidhya | Medium
[60] Reworked from: Achieve Foundation (2021): "What are Digital literacy, Data literacy, and Media literacy?", Help Guides Research, at: What are Digital Literacy, Media Literacy and Data Literacy? (achievefoundation.org.uk)
[61] Reworked from: Trudi E.Jacobson, Thomas P. Mackey (2016): *Metaliteracy in practice*, ISBN 978-0-8389-1379-6 , at: Metaliteracy in Practice (ala.org)
[62] Reworked from: Wikipedia (2024): "Digital Literacy - History", in *Wikipedia*, at: Digital literacy - Wikipedia
[63] Reworked from: Kedar Gautam, (2024). "The Pillars of Digital Literacy: how digital literacy can safeguard our online presence", in *One Man Peace Campaign* at: The Pillars of Digital Literacy: How Digital Literacy Can Safeguard Our Online Presence (substack.com)

and personal identity protections. In this light, conceiving, designing, and developing future research on novel education settings and programs is namely imperative. These should be vowed to instruct and teach information consumers, users, and targets on strategies and tactics aimed at facing both proactively and effectively AI-powered sensory-driven manipulations of perception, thought, feelings, and emotions, therefore attaining aware, informed, as well as making conscious choices and decisions. In fact, these novel models for AI digital literacy should be dedicated to building and achieving reasoned trustworthiness of AI-generated data and contents, which is crucial for AI acceptance and governance.

- **Liability of Autonomous Systems: distributed responsibility versus moral machines**: as AI systems become increasingly autonomous, questions arise about liability and accountability in the event of system failures or errors. On the one hand, the principle of "distributed responsibility**"** applies, attributing differentiating degrees of responsibility to all human agents involved in conceiving, designing, developing, and validating AI-powered systems such as *reactive* and *limited memory*. On the other hand, some scholars argued that within generative AI *theory of mind* and *self-awareness* could be endowed with a certain share of responsibility: glossed as "moral machines", they might be morally and legally liable. So, although disturbing in the author's view, legal frameworks need anyway to evolve to address issues related to assigning responsibility when AI systems cause harm or make decisions with unintended consequences.
- **Ethical AI Governance and Regulation**: there is a growing need for frameworks and regulations to govern the development, deployment, and use of AI technologies. More research in this area is needed, which should focus on developing ethical guidelines, standards, and regulatory frameworks to ensure the responsible and equitable use of AI.
- **Impacts on Employment and Socioeconomic Inequality**: here AI-driven automation has the potential to disrupt labor markets and exacerbate socioeconomic inequalities. More research is necessary, to examine the implications of AI technologies on employment patterns, job displacement, and income distribution, and explores policy interventions to mitigate negative consequences.
- **Impacts on Healthcare and Biomedical Ethics**: here AI technologies have transformative potential in healthcare, but raise complex ethical issues related to patient privacy, consent management, and the responsible use of medical data. More research is needed, focusing on developing ethical guidelines for AI-driven healthcare applications, ensuring equity in access to healthcare services, and addressing concerns about algorithmic bias in medical diagnosis and treatment.

- **Impacts on Environment and Energy**: the development and deployment of AI technologies have clear environmental impacts, including increased energy consumption and electronic waste. More research should be fostered to explore strategies for developing sustainable AI systems and minimizing the environmental footprint of AI infrastructure.

Addressing these ethical, legal, and social challenges is critical to realizing the full potential embodied by AI while simultaneously ensuring that its benefits are equitably distributed, and its risks are responsibly mitigated. Interdisciplinary collaboration among researchers, scientists, policymakers, industry stakeholders, and civil society organizations is essential to steer and harvest benefits across these complex issues more effectively.

Nurturing policy: lookouts, insights, foresights

Overall, it has ben shown to what extent AI is rapidly expanding across most branches of science, research, technology, industry, economy, sustainability, politics, and culture, outlining great and unpredictable strides. So, it is expected to change science, research, innovation, business, resource use, and politics landscape in the EU and beyond, as far as their upper limits in diverse science settings. The current EU world leading position in AI enablers invokes far-sighted policies able to upgrade research on them into innovative applications. Therefore, policies should be committed to both promoting and upscaling AI enabled research in sciences and industries from TRL3 towards TRL7: thus, AI safety sounds as a crucial issue in the light of the afore addressed and evoked risks, by tackling them well beyond their mere mitigation measures. In this light, novel AI-sciened policy lookouts, innovative insights and pioneering foresights are outlined, illustrated, and discussed.

Policy lookouts: novel AI-scienced consciousness

Some concrete steps for future research have been recently outlined by the European Commission Presidency to make AI safer.[64] Key actions have been oriented to: (i) equip independent scientific community with appropriate means to evaluate AI systems, thru public funding and access to the best supercomputers (e.g. Lumi in Finland and Leonardo in Italy): (ii) develop internationally accepted procedures and standards to test AI safety; (iii) report and follow-up each significant incident induced by AI errors, dual use or misuse; (iv) set up an international alerting system fed by trusted flaggers.

In this light, it is clear to what extent EU public authorities are ultimately meant responsible for the safety and security of citizens, thru powers of intervention to complement self regulation, thus supporting AI innovation and simultaneously harvesting its benefits. This is the objective of the foundation of a European AI Office, currently under European Commission examination, which should: (a) foster standards and testing practices for frontier AI systems cooperating with the scientific community; (b) complement the private sector in investigation and testing; (c) develop alert-based enforcement of AI developers' responsibility; (d) implement common rules in Member States for advanced AI, simultaneously cooperating with analogous entities worldwide.

In this light, the European Commission has recently launched a stakeholder survey exercise to gather views on G7 guiding principles on generative AI, dedicated to outlining International Guiding Principles for organizations developing advanced AI systems: these have been agreed by G7 ministers for

[64] AI Bletchey Park Safety Meeting (2023). Remarks from President von der Leyden at the Bletchey Park AI Safety meeting- Speech, 2nd November 2023, at: Remarks of President von der Leyen at the AI Safety Summit (europa.eu)

stakeholder consultation, whose expected outcome has been identifying key principles to frame consequential lookouts for future EU policies.[65]

These principles are currently developed by G7 Members under the *Hiroshima Artificial Intelligence* process,[66] vowed to set up drivers and standard guardrails at global level. The eleven draft guiding principles cover advanced AI systems such as foundational models and generative AI, aim at promoting both safety and trustworthiness of AI-powered technologies**,** paving the way to compile a G7 Code of Conduct providing guidance for organizations developing AI tools.

In fact, from the security perspective, the potentialities enabled by AI to tailor-make new biological functions and functionalities would also open the floor to malignant purposes and pernicious dual use applications. In this light, embedding AI applications into life sciences will then require a strictly responsible and ethical approach. This paves thee way to raise specific ethical questions, where the principle of responsibility is crucial: designing new tools to address potentially novel biological functionalities might foster and mirror malevolent applications, encompassed in the concept of potential dual use.

Operational risks can jeopardize the daily functioning capabilities, e.g., in healthcare, by producing consolidated drugs, providing clinical data acquisition and diagnostics, preventing the associated systems from functioning properly and accurately: this may happen by relying upon incorrect AI-generated advice or using the output from a poisoned model, for example resulting in unwanted corruption and leakage of privacy data and confidential intellectual property. Finally, legal risks may occur when the use of generative AI exposes to civil and criminal actions, which might arise from confabulation, privacy and copyright infringements, harming end-users by info faked by biased AI tools, finally exposing to lawsuits, penalties, and reputational damage.

As a consequence, examining for instance the case of AI-augmented medicine, a non-exhaustive set of negative impacts can be evicted from the AI-related risks described above, and summarized accordingly:[67] (i) biased clinical and pharmacological outputs; (ii) unreliable clinical results; (iii) abuse, misuse or dual use of patient privacy; (iv) overreliance on AI-generated guidance; (v) cumulative man-machine errors and patient harm.

This is particularly relevant for AI-enabled systems which might lead to generate easily accessible and widespread tools for developing and deploying biological

[65] Reworked from: *Commission gathers views on G7 Guiding Principles on generative Artificial Intelligence*, Daily News 13 / 10 / 2023 (europa.eu).
[66] EC (2023) Shaping Europoe Digital Future - International Draft Guiding Principles for Organizations Developing Advanced AI systems | Shaping Europe's digital future (europa.eu)
[67] Huddle, M., Kellar, J., Srikumar, K., Deepak, K., Martine, D. (2023). *How generative AI is transforming health care sooner than you think*, in BCG How Generative AI is Transforming Healthcare | BCG

warfare, e.g., by creating pathogens by-design, or identifying vulnerabilities in business or defense by infiltrating and triggering decisions in milliseconds therein. The same applies to misinformation and malignant information. Also, likely uses tested in marketing, AI could be used for manipulative purposes in autocratic regimes, heavily impacting on democracy integrity, especially in this year 2024, where around 40% of world population is expected to go to polls.

In this light, AI-powered dual uses should be closely monitored and screened:[68] a quite big bulk of studies begins to flourish on all this around the world, which is rapidly increasing. A non-exhaustive set of risks raised by AI-enabled sciences, research and technological innovations is illustrated and detailed accordingly. This requires fresh policy attention to outline consequential novel European policy lookouts.

In fact, AI and especially generative AI related risks may fall into several broad categories: functional, operational, and legal. Functional risks embrace (i) model drift and (ii) data poisoning: on the one hand, model drift occurs when a model gradually loses alignment with the environment it was trained to help, so the model should retrain on refreshed data, though time-consuming; on the other hand, data poisoning happens when a malignant actor corrupts data streams which train the model, inducing pernicious self-modifications, inducing hallucinations into the outputs: this may happen, for instance, when drug bio-design relies upon a Large Language Models such as ChatGPT-style AI system, whose data training flow has been corrupted by citing fictional cases. So, abuse and misuse of AI-powered systems could impact onto large scales.

[68] Reworked from: (i) UNESCO (2022) *Ethics of AI*, https://www.unesco.org/en/artificial-intelligence/recommendation-ethics; (ii) UNESCO (2023) "Unesco and Microsoft commit to promote Unesco's recommendations on the ethics in AI", https://www.unesco.org/en/articles/unesco-and-microsoft-commit-promoting-unescos-recommendation-ethics-ai?hub=32618

Recent cases of abuse and misuse of AI-powered tools and systems deserve a detailed digression: over the last decade some AI-supported online platforms (e.g., TikTok, Instagram, Twitter, YouTube, and Facebook) have become increasingly harmful to digitally vulnerable users, with a peak experienced during 2020-2021 Covid-induced lockdowns. This has been documented by YouTube,[69] while Instagram also faced harsh and largely spread criticism for allegedly jeopardizing teen girls' mental health.[70]

Then, specific studies have been carried out to study the impact of these platforms on youngsters: apparently, TikTok scored worst: an independent and targeted research undoubtedly indicated that, which has been carried out by the Tech Oversight Project, highlighting in March 2023 the perils inherent in its *"last attempt to deceive parents, endanger children and mislead lawmakers"* (*sic*)[71]. In fact, it has been shown the extent of the perniciousness of these systems:[72] by managing to vampirize users' time spent on the platform by painstakingly and promptly rushing alluring and eye-catching contents, AI-supported platform have been enabled to reinforce the rewarding cycle, blasting emotions by educing dopamine discharges thru video outburst: in this light, they were defined by selected scholars as '*digital fentanyl'*,[73] as well as '*deadly by design'*.[74]

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[69] Youtube, (2021). *Study of YouTube comments finds effects of radicalization effects,* https://techcrunch.com/2020/01/28/study-of-youtube-comments-finds-evidence-of-radicalization-effect/?guccounter=1

[70] The Wall Street Journal, (2021) "Facebook knows Instagram is toxic for teen girls", https://www.wsj.com/articles/facebook-knows-instagram-is-toxic-for-teen-girls-company-documents-show-11631620739

[71] The Tech Oversight Project (2023). *The Tech oversight project issue statement on TikTok last attempt to deceive parents, endanger children and mislead lawmakers,* https://techoversight.org/2023/03/01/tech-oversight-project-issues-statement-on-tiktoks-latest-attempt-to-deceive-parents-endanger-children-and-mislead-lawmakers/

[72] *Ibidem:* this study indeed demonstrated to what extent some of these platforms working thru AI-based algorithms of reinforced learning have been virtually forcing most digitally vulnerable users down rabbit holes surfacing and getting across them increasingly extreme, radicalized and toxic content. Being linked to its Chinese parent company ByteDance, TikTok platform accounts for lion's share of all reported cases among the most harmful platforms. Recent studies of this AI-supported online platform raised serious doubts about their ethical acceptability. This is mainly due to the opacity of their IA-supported algorithms: based on reinforced learning patterns, they have put at thoughtful stake their ways of collecting, interpreting and processing person-related features and data (e.g., personal data, biometry, facial expressions) in order to make consequential choices. Apparently, these algorithms are purposefully and conscientiously designed and then used by these platforms to keep the most of the users' attention: by identifying some key personality features and predispositions, they manage to rapidly select, identify, propose, and purposefully reiterate video contents to users. Doing so, they appetize and feed their predilections, awarding their inclinations and proclivities by running reinforced awarding patterns.

[73] From: (i) CNN, (2023). "TikTok is 'digital fentanyl' incoming GOP China committee says", CNN Business, March 2023. https://edition.cnn.com/2023/01/01/tech/tiktok-mike-gallagher/index.html; (ii) Hindustan Times, "'Digital fentanyl, deadly opioid': TikTok under political storm in US congress", January 2023. These sources highlight that, by exacerbating the users' fragility and exposure to emotive aggression, these AI-supported online platforms tend to expose most digitally vulnerable users, like teens and kids, to contents which are potentially harmful for mental health, inducing anxiety, addiction, loss of attention and self-esteem, depression, eating disorders, definitely leading to instigating self-destructive syndromes up to suicide.

[74] CCDH, Center for Countering Digital Hate (2022). « Deadly by design – TikTok pushes harmful content promoting eating disorders and self-harm into young users' feeds », https://counterhate.com/research/deadly-by-design/

Some outcomes demonstrated to become devastating for teens and youngsters' mental health,[75] diagnosed even in children and kids.[76] This challenged the issue of distributed responsibility, claiming for establishing public or private policy frameworks to set up boundaries for establishing legal liability. So, several countries entirely or partially banned the use of this platform (e.g., India, Bangladesh, Indonesia, China, and very recently France), followed by many US colleges, together with selected companies, e.g., BBC, and European institutions, which debarred the associated app from work devices in the present year.

This anew required fresh policy attention and novel European policy lookouts, pushing several bodies to promptly intervene, although achieving partially their objectives: on the EU policy side, the European Commission took quite recently a clear position, publishing a sound package[77] for a "Digital Service Act",[78] which aims at governing the content of online platforms, although raising some ambiguities.[79] The enforcement of this Act will induce these platforms to swiftly remove from summer 2023 harmful content, thus creating a safer digital space protecting the users' fundamental rights.[80] Safer, though not fully safe.

However, according to various experts, the AI-supported platforms could circumvent these actions, because of their political influence and economic weight,[81] and by virtue of their dominant lobbying position respect to EU institutions. Additionally, the almost weak taxing powers held by European authorities, together with the solely conventional legal arsenal, are likely to add more limits to the Digital Service Act:[82] a broader discussion over the entire engineering design and on rethinking the entire business model of these platforms would be welcome by some scholars,[83] as their purpose should be redefined to protect global mental health.[84]

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[75] The Times of India, (2022). "Two big reasons to keep your child away from TikTok," https://timesofindia.indiatimes.com/gadgets-news/two-big-reasons-to-keep-your-child-away-from-tiktok/articleshow/96257909.cms

[76] CNN, (2023). "Why experts worry TikTok could add to mental crisis among US teens", https://edition.cnn.com/2023/01/11/tech/tiktok-teen-mental-health/index.html

[77] EC, *Digital Service Act Package*, (2023). https://digital-strategy.ec.europa.eu/en/policies/digital-services-act-package

[78] EC, (2022). *Digital Service Act, 2020/0361* (COD). https://oeil.secure.europarl.europa.eu/oeil/popups/ficheprocedure.do?reference=2020/0361(COD)&l=en

[79] TikTok, (2021). "TikTok calls for EU DSA…", https://newsroom.tiktok.com/en-eu/tiktok-calls-for-digital-services-act-to-support-innovative-transparency-initiatives

[80] POLITICO, 2023. "TikTok, Twitter, Facebook set to face EU crackdown on toxic content" https://www.politico.eu/article/tiktok-confirms-it-faces-highest-content-moderation-obligations-under-eu-law/

[81] CSactu (2022). *The Digital Service Act: stakes and limits*. https://www.csactu.fr/the-digital-service-act-stakes-and-limits/

[82] *Ibidem*

[83] BCG (2023). "Rethinkig e-commerce for the era of the metaverse". https://www.bcg.com/publications/2023/the-future-of-e-commerce

[84] Harvard Edu, (2022). "TikTok but the party don't stop, no. " Digital innovation initiative. https://d3.harvard.edu/platform-digit/submission/tiktok-but-the-party-dont-stop-no/

The recent case put forward by the city of New York suing against platforms such as TikTok, YouTube, and Instagram are corroborating these considerations: in fact, lawsuit has accused these tech companies of creating 'addictive and dangerous' products that are fueling mental health crisis.[85]

These considerations pinpoint to what extent both AI abuse and misuse risks can jeopardize even youngsters' health. Building on long-term awareness is the best risk mitigation strategy:[86] therefore, the most efficient approach to address generative AI risks could be to develop and adopt a well-defined machine learning operations lifecycle: this should be embedded in a broader governance framework within the boundaries of which AI-enabled sciences, research, and technologies actors, organization or stakeholder develop and use generative AI.

This novel governance frameworks and models should be designed, implemented, and performed by involving ICT teams in creating policies, but also nano-biotechnologists, cybersecurity, legal and social scientists, risk managers, HR leaders and specialists: they should be regularly revisiting their AI policies and carry out table-top exercises to stress and test them through scenarios involving potential bottlenecks and solutions to circumvent and respond to risk. Additionally, they should periodically re-discuss on which AI-related policies are put in place, powered and why, putting and keeping human-centricity at the center of gravity of all that: this approach can be clearly evicted from the conclusions drawn from the last two "World Economic Forum" held in Davos in 2023 and 2024.[87]

In this light, diverse policy lookouts are outlined for promoting future ethical, social, legal, and social research to enhance AI safety by going beyond mitigating risks, whilst simultaneously benefitting from the AI-powered undeniable groundbreaking prospects.

In this light, addressing the clear gap existing between incipient research on AI risks and the way to mitigate and circumvent them should be object for future EU-funded research: some essential lookouts on the drivers leading to the main

[85] (The) Guardian (2024). "New York sues TikTok, Instagram and YouTube over 'addictive' platforms for children", at New York sues TikTok, Instagram and YouTube over 'addictive' platforms for children | New York | The Guardian
[86] *Ibidem,* p2.
[87] World Economic Forum AI Governance Summit: What to know | World Economic Forum (weforum.org), 13-15 November 2023. World Economic Forum (2024). "Europe must up its game on AI", Ursula von der Leyden speech, Davos, at: https://www.researchprofessional.com/0/rr/news/europe/innovation/2024/1/Europe-must-up-its-game-on-AI--says-Commission-president.html#sthash.xKTjcXPH.zCpydNMd.dpuf; World Economic Forum (2024). Report. The World 2024 Special Report (ft.com)

AI-related risks are addressed, identified, analyzed, and assessed accordingly,[88] i.e.,

(i) Targeting research funding instruments, specifically addressing novel conception, design, and development of AI-supported systems into precision, predictive and personalized medicine, where their expected impact would be undeniably beneficial, shaped on the respect and safeguard of patient privacy, clinical data protection, fairness, and equity.

(ii) Funneling funding research on AI enablers and applications dedicated to the following most strategic scientific areas: (a) augmented medicine and healthcare, structured in diagnostics; theragnostics; targeted drug-delivery; and regenerative medicine; (b) industrial technologies and manufacture; (c) sustainable environment and energy; (d) ICT, mobility, and security; (e) ethical, legal, and social disciplines. All of them should target novel policies, therefore shaping innovative politics and governance patterns.

(iii) Facilitating data blending from diverse technological processes, manufacturing factories, and sites to enable accessing quality data, their standardization formats and communication protocols, which are strongly needed in AI-enabled sciences, research, and technologies, especially including those characterizing SME ecosystems and manufacturing sites at large.

(iv) Conceiving, designing and developing dedicated expert workshops gathering: (a) selected AI experts in industries; (b) stakeholders; and (c) civil society associations, such as ICT security providers and users, patient and medical societies, to work together for identifying key research priorities: this exercise would be vowed to foster responsible uptake and embedding of AI into sciences, research and technologies and related industries, promoting sustainable and human-centric prosperity in EU economy, industry, society, sustainability, politics, and culture at large.[89] The outcome should be identifying a set of recommendable policy actions on future science and research fostering

[88] TechTarget – Enterprise AI - Burke, J. (2023) : What are the risks and limitations of generative AI? | TechTarget, 13 November 2023.

[89] Analogous exercises were carried out by EC to identify science and reseach policies in regenerative nanobiomedicine and nanotech outreach, whose outputs, upshots and outcomes fed into the design of topics into RTD workprogrammes of FP7, e.g. (i) Bonazzi, et al., (2017): *Towards nanotechnology osteo-chondral reconstruction*, EC Publication Office ISBN 978-92-79-74132-6; doi: 10.2777/292697 KI-04-17-901-EN-N ©); (ii) Bonazzi, M., Neicu, M., Millar, J., Schuurbiers, D. (2013). *Reaching out to the future: outline of proposals for communnication outreach, societal dialogue and education on nanotechnology*. ISBN: 978-92-79-25114-6, EUR: EUR 25361 catalogue n°: KI-NA-25-361-EN-N.

> responsible AI uptake and embedding into the most relevant sciences, research and technologies and related industries: all this vowed to finally addressing global health, sustainability, ICT security, safety, well-being and prosperity in the EU and beyond.

From all that, it can be evicted that the growing AI uptake will arouse the need for a greater emphasis on responsible AI conception, design and development, usage, and ethics,[90] which will be pivotal to conceive, design, illustrate, and assess freshly innovative policy insights.

Policy insights: innovative AI-scienced mindfulness

Overall, dedicated actions should be devoted to address key ethical AI-related issues: several actions could be envisaged, e.g., targeted expert debates, which should therefore analyze, discuss, and foster responsible and ethically grounded trustworthiness of AI-supported systems in sciences, research and technologies and related industries. In fact, it has been shown to what extent trustworthiness demonstrated to become essential and crucial for AI acceptance and governance in science, research, technology, economy, society, politics, and culture at large.[91]

This largely depends on transparency, ethics and sense of responsibility shaping the ways AI is upstream conceived, designed and developed, as well as on the way it is downstream applied and used. In practical terms, it is recommended to ask AI designers, engineers, and manufacturers to explicitly, minutely, and distinctly detail: (i) for what purpose, (ii) doing what, and (iii) how are AI systems conceived, designed, developed, and validated, and which business models is expected to reflect thoroughly all that.

Because of that, the mentioned AI developments pose a challenge to policymakers and regulators to keep consistent pace and implement coherent policies and legal frameworks to simultaneously exploit their potential and mitigate risks. This is particularly relevant for generative AI, the forefront of AI, which is capable to generate and pursue its own objectives thru self-designed processes. In fact, computational infrastructures, skills, and data require to develop and implement AI systems which are often exceeding jurisdictional borders.

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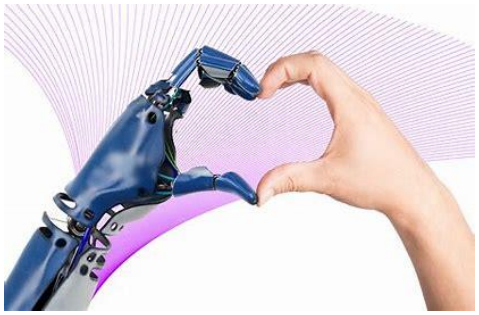
[90] Reworked from: (i) https://ec.europa.eu/info/strategy/priorities-2019-2024/europe-fit-digital-age_en; (ii) Bonazzi, M., (2013). *Communicated Nanotechnology: outreach, dialogues and education within civil society*. ISBN: 978-92-79-21477-6, EUR 24962, DOI: 10.2777/77541.

[91] Meyer, F. (2020) : "Foundations for trustworthy artificial intelligence", in *ETHzürich*, at: Foundations for trustworthy artificial intelligence | ETH Zurich

As a matter of fact, AI can empower and enable diverse applications thru all stages of production workflows, blending data from different processes to enable holistic optimizations. So, *accessing quality data* is a major need, as well as promoting *data formats standardization* and appropriate *communication protocols*, whose scarcity affect SMEs harder. Then, setting up data spaces as well as testing experimentation facilities could help to address this deadlock, thus enabling also to deploy AI solutions more effectively.[92]



Clearly, AI-boosted science, research, and innovation capabilities raise the question on what purpose AI-based systems are finally designed for, either techno-centric or human-centric: since AI-systems largely outstrip and technically outshine many human capabilities, defining their objectives in a human-centric perspective is essential to enable humans retaining control and power over them:[93] this ultimately outlines the need for forward-looking policy insights.

In fact, the real issue is misalignment between human-centric objectives and underlying purposes shaping AI-supported systems. It is not a matter of letting

[92] JRC Report (2022) AI Watch: *AI uptake in Manufacturing* Authors: Sarah de Nigris, Richard Haarburger, Jiri Hradec, Massimo Craglia, Daniel Nepelski. EUR 31121, European Union, pp.34-35.
[93] OECD (2023): "What's next? And after that?" presentation by Prof. Stuart Russell, Berkeley University. *International conference on AI in Work, Innnovation, Productivity, Skills*. https://www.oecd-events.org/ai-wips-2023/onlinesession/445db455-0cb9-ed11-994c-000d3a469307

AI-based systems to pursue the purposes they might engender by imitating humans, namely inappropriate, as happened in AI-based social media e.g., algorithm-supported online platforms aiming at maximizing users' clicks and engagement, modifying users' cognitive intake to become more predictable in their content consumption, thus more governable: this is requiring attention in terms of forward-thinking policy insights.

In fact, the more powerful algorithms are equipped with incorrect or inappropriate objectives, the worse outcome they are expected to produce. In fact, the risk lies in the possibility that AI systems might design their own objectives by mimicking or imitating human learning patterns, whose outcomes could become harmful indeed. This issue has been very recently and promptly put forward by an open letter signed by extensive swarms of scholars and scientists, who claim for a responsible pausing of AI experiments as this could namely menace both the course of human life and the overall societal discourse.[94] In fact, this is precisely the essence of the "black-box" issue: according to this viewpoint, it is not clear yet whether and to what extent AI-supported systems might engender their own internal goals to pursue, whose action dynamics and operational patterns are largely unknown and unpredictable. So, the precautionary principle should apply herein.[95]

In this light, it is essential to re-shape innovative policy insights, vowed to nurture models for responsible AI-systems: they should become "*responsible-by-design"*, which means responsibly designed to fulfil specific objectives strictly defined by humans. This means that they should essentially become fully vowed to act in the best interests of humans by simultaneously pursuing human-centric objectives and disregarding the internal goals AI systems might create by mimicking human learning patterns. In practical terms: (i) on the one hand, their actions should not focus on the internal purposes they might be creating by mirroring and mimicking human learning patterns, whose operating dynamics are largely unpredictable; (ii) on the other hand, they should act to pursue human-centric purposes which need to be strictly a priori defined. For fitting in with the responsibility principle, responsible AI-based systems and machines should serve humans, and not the other way round.

In fact, it would sound irresponsible to deploy AI-based systems which is uncertain if they produce or not their internal goals, and whose inner operational dynamics are largely unpredictable. Responsible-by-design AI systems should

[94] Future of Life Institute (2023). *Pause giant AI experiments: an Open Letter*, https://futureoflife.org/open-letter/pause-giant-ai-experiments/

[95] Reworked from: (i) Future of Life Institute (2023). *The AI Act*, https://artificialintelligenceact.eu/about/ (ii) OECD (2023): "What's next? And after that?" presentation by Prof. Stuart Russell, Berkeley University. *International conference on AI in Work, Innnovation, Productivity, Skills*. https://www.oecd-events.org/ai-wips-2023/onlinesession/445db455-0cb9-ed11-994c-000d3a469307

perform in the best interests of humans, while remaining explicitly uncertain about what those interests are.

This is formulated as a mathematically shaped assistance game, where AI-based systems display their role as solvers, by: (i) acting with deference in respect to humans; (ii) remaining minimally invasive; and (iii) showing willingness to be switched off, which definitely solve the control issue.[96] In this light, the AI-based systems in AI-powered augmented medicine and healthcare sound as a quite enlightening virtuous example. In fact, they behave as supporting tools which remain strictly under the steer of healthcare operators, who take the ultimate lead.

In this light, promoting these new models for responsible-by-design AI would become essential for EU policies, both aimed at regulating and label them.[97] In fact, they are expected to address the vast novel technological possibilities AI would enable in cutting-edge sectors where human control is still pivotal, e.g., medicine diagnostics, theragnostics, targeted drug-delivery and regenerative medicine; sustainable development; mobility; security; privacy and governance. This arouses clear issues in terms of human-centricity, especially whether and where AI permits to designing novel functionalities which claim for pursuing clever responsible and ethical approaches in especially high-risk cases.[98]

Likewise similar issues raised in the past decades by debates on nano-biosciences and synthetic biology, AI-enabled science breakthroughs, research prospects and innovation outcomes could pave the way for conceiving, designing, and developing entirely innovative tools to enhance efficiency, accuracy, and affordability of most technoeconomic cycles. This might also raise issues going beyond reflections on human-centricity: some of them sound quite disturbing, such as AI-enabled prospects leading to transhumanism and human enhancement.[99] Novel AI-enabled scientific breakthroughs and technological innovations, and their associated research prospects, could outline and instill completely new functions and novel functionalities into human society, economy,

[96] *Ibidem*
[97] *Ibidem*
[98] Reworked from: (i) De Nigris, S., Craglia, M., Nepelski, D., Hradec, J., Gomez-Gonzales, E., Gomez Gutierrez, E., Cardona, M. AI Watch (2020). *AI Uptake in Health and Healthcare* JRC Technical Reports: JRC; (ii) Bonazzi, M., (Ed.) (2011). *Successful European Nanotechnology research*. EUR n°: 24055; 24524; catalogue n°: KI-NA-24524-EN-C; ISBN: 978-92-79-15623-6, at http://ec.europa.eu/research/industrial_technologies/publications-reports_en.html
[99] Reworked from: (i) Bonazzi, M. and Tomellini, R. (2007): "Exploiting the convergence of technologies to repair our body", in the column *'A window on the European Commission*', Bulletin of the Australasian Scientific Community n°24 August 2007, http://www.scientificambitalia.org/pdf/790_ita.pdf ; (ii) Bonazzi, M. (Ed.) (2013); Authors: Filipponi, L., Sutherland, D. *Nanotechnologies: principles, applications, implications and hands-on activities - A compendium* for *educators*; ISBN 978-92-79-21437-0, EUR 2495, doi:10.2777/76945, catalogue KI-NA-24-957-EN-C.; (iii) Bonazzi, M., (2010). *Communicating Nanotechnology – an Action packed Roadmap for a brand new Dialogue*; European Commission, EUR n°: 24055; ISBN: 9789279134135, at: http://ec.europa.eu/research/industrial_technologies/pdf/communicating-nanotechnology_en.pdf

industry, sustainability, politics, and even culture.[100]

In this light, defining appropriate conception, design and development of human centricity becomes a crucial issue: stemming from AI-scienced lookout, and nurtured thru AI-scienced policy insights, it will be leading towards pioneering AI-scienced policy foresights, sketching ground-breaking roadmaps.

Policy foresights: creative AI-scienced wisdom

Etymologically speaking, the term human-centricity for AI seems almost self-explanatory: however, more targeted research is needed, whose prospects are crucial for enabling democracy models, procedures and protocols kept up with the AI skyrocketing development pace. In fact, from the epistemology's standpoint – which stems from the theory of knowledge associated with the mind's relation to reality – AI definition, aim, scope, challenges, and impact domains should be expanded to embrace responsibility and ethics universal principles, and their associated legal liability. In fact, both ethical and legal issues associated with AI scope and ambitions (and therefore its impacts) will seemingly subsume issues such as *privacy* and *surveillance*, *bias***,** or *discrimination*.

Thus, they potentially challenge the philosophical role of human discernment and judgment in decision-making. So, UNESCO, OECD and The White House indicated that AI governance actors should respect human rights principles and democratic values, throughout the entire AI conception, development and deployment.[101] These principles subsume and include inner semantic notions such as: freedom, human dignity and autonomy, privacy and data protection, non-discrimination and equality, diversity, fairness, social justice and internationally recognized labor rights:[102] *safety*, *health* and *fundamental rights* (e.g.

[100] Reworked from: (i) Bonazzi, M., (Ed.) (2011). *Successful European Nanotechnology research*. EUR n°: 24055; 24524; catalogue n°: KI-NA-24524-EN-C; ISBN: 978-92-79-15623-6, at:http://ec.europa.eu/research/industrial_technologies/publications-reports_en.html; (ii) Silvia Faré, Sorin Melinte, Adriele Prina-Mello (Eds.) (2023) *AI for nanotechnology, AI for nanobiotechnology:* https://www.frontiersin.org/research-topics/31068/ai-for-nanobiotechnology

[101]Reworked from: (i) The WHITE HOUSE blueprint report on AI (2023): *Strengthening and Democratizing the U.S. Artificial Intelligence Innovation Ecosystem*, by the National Artificial Intelligence Research Resource (NAIRR) Task Force, in https://www.ai.gov/wp-content/uploads/2023/01/NAIRR-TF-Final-Report-2023.pdf (ii) Government Technology (2023), *Understanding the four types of AI*, in https://www.govtech.com/computing/understanding-the-four-types-of-artificial-intelligence.html; (iii) OECD (2019), *Enhancing Access to and Sharing of Data: Reconciling Risks and Benefits for Data Re-use across Societies*, OECD Publishing, Paris, https://doi.org/10.1787/276aaca8- en; (iv) UNESCO (2022) *Ethics of AI, https://www.unesco.org/en/artificial-intelligence/recommendation-ethics;*

[102] Reworked from: (i) Bonazzi, M., Neicu, M., Millar, J., Schuurbiers, D. (2013). *Reaching out to the future: outline of proposals for communication outreach, societal dialogue and education on nanotechnology*. ISBN: 978-92-79-25114-6, EUR: EUR 25361 catalogue n°: KI-NA-25-361-EN-N; (ii) UNESCO (2022) *Ethics of AI,* https://www.unesco.org/en/artificial-intelligence/recommendation-ethics

trustworthiness and *impartiality*) for everyone are the ultimate goal their associated moral and legal liabilities should guarantee.[103]

Thus, likewise ethically-relevant debates previously faced in nanobiotechnologies and synthetic biology over the last decades, responsible and ethical approaches should become usual practice in AI: their should be head-of-stone in designing, developing, and deploying AI with a good, proper and appropriate intentions to endow citizens, consumers, employees and businesses with the associated benefits, while simultaneously empowering and respecting universally recognized ethical principles.[104] So, raising ethical principles should be encompassed in each and every AI-supported system, process, and procedure, as well as into their downstream impact on society, economy, industry, sustainability, politics, and further on culture too.[105]

Driving deep from its hermeneutics, the following key conceptual principles of responsible AI would apply: (a) *Soundness*: comprehend context as well as uphold data quality and model performance; (b) *Fairness*: identify and remove discrimination and support diversity and inclusion; (c) *Transparency*: provide explainability, understandability and traceability. Building on that, key tech companies (e.g. Microsoft, in February 2023), co-working with UNESCO, are opting for using six pragmatic principles driving AI development and use: (i) *fairness*, (ii) *reliability and safety*, (iii) *privacy and security*, (iv) *inclusiveness*, (v) *transparency*, and (vi) *accountability*.[106]

These principles are not trivial, as they may be considered as the head-of-a-stone of a responsible and trustworthy approach to AI, especially as this technologies'

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[103] Reworked from: (i) The WHITE HOUSE blueprint report on AI (2023): *Strengthening and Democratizing the U.S. Artificial Intelligence Innovation Ecosystem*, by the National Artificial Intelligence Research Resource (NAIRR) Task Force, in https://www.ai.gov/wp-content/uploads/2023/01/NAIRR-TF-Final-Report-2023.pdf (ii) Government Technology (2023), *Understanding the four types of AI*, in https://www.govtech.com/computing/understanding-the-four-types-of-artificial-intelligence.html

[104] Reworked from: (i) Bonazzi, M. (Ed.); Authors: Filipponi, L., Sutherland, D. (2013). *Nanotechnologies: principles, applications, implications - a compendium for educators* ; ISBN 978-92-79-21437-0, EUR 2495, doi:10.2777/76945, catalogue KI-NA-24-957-EN-C ; (ii) OECD (2019), *Enhancing Access to and Sharing of Data: Reconciling Risks and Benefits for Data Re-use across Societies*, OECD Publishing, Paris, https://doi.org/10.1787/276aaca8- en; (iii) Bonazzi, M. (2006). "Reconstructing man? The power of converging technologies", Cordis Wire, 15.11.2006, (in Converging Technologies, https://cordis.europa.eu/wire/index.cfm?fuseaction=article.Detail&rcn=11117)

[105] Reworked from: (i) Bonazzi, M., (2010). *Communicating Nanotechnology – an Action packed Roadmap for a brand new Dialogue*; European Commission, EUR n°: 24055; ISBN: 9789279134135, at: http://ec.europa.eu/research/industrial_technologies/pdf/communicating-nanotechnology_en.pdf ; (ii) Bonazzi, M., (2010). *Knowledge, attitudes and opinions on nanotechs across European youth*, ISBN: 9789279159046, at: http://ec.europa.eu/research/industrial_technologies/pdf/knowledge-attitude-opinions-on-nanotech_en.pdf

[106] Reworked from: (i) UNESCO (2022). *Ethics of AI*, https://www.unesco.org/en/artificial-intelligence/recommendation-ethics; (ii) UNESCO (2021|), "UNESCO member states adopt the first ever global agreement on the Ethics of Artificial Intelligence", in https://www.unesco.org/en/articles/unesco-member-states-adopt-first-ever-global-agreement-ethics-artificial-intelligence; (iii) UNESCO (2023) "Unesco and Microsoft commit to promote Unesco's recommendations on the ethics in AI", https://www.unesco.org/en/articles/unesco-and-microsoft-commit-promoting-unescos-recommendation-ethics-ai?hub=32618

sets are becoming increasingly prevalent in goods, products and services for everyday use. On the one hand ‘universally recognized’ ethical principles are ethicalities which should be considered as unanimously recognized; on the other hand, every individual, company, and region might exert their own moral beliefs and standards, which are historical and cultural products. These last are usually mirrored in conceiving, designing, and developing more ‘local’ moralities, finally reflecting their paradigms in shaping technological acceptance at large, and more specifically when tackling AI-supported systems.

Moral responsibility and legal liability should therefore be attributed to all those human agents consciously choosing to design, develop, validate, and even use those systems: this is the perspective shaped by the notion of *distributed responsibility*.[107] This vindicates by attributing differentiating degrees, levels, and types of responsibility to all human agents involved in conceiving, designing, developing, and validating AI systems.

This is not a trivial question: AI-enabled systems supporting human-centric objectives such as patient well-being in medicine and healthcare enable a clear distribution of responsibility throughout and across the entire demand, supply, and use chain, as the final decision-making is ultimately kept by physicians. However, this consideration applies particularly well also to information demand, supply, and use: in fact, AI-powered systems can produce virtual realities which cannot be distinguished from authentic reality, due to the perfection of the images, sounds and tactile experiences they are able to instill and evoke. So, three out of five human sensory experiences (i.e., sight, earing, touch) can be mimicked in an astonishingly exact way, so that it is hardly possible for human beings to discriminate them from the physical, authentic, and real sensations and perceptions.

[107] Strasser, A. (2022). ”Distributed responsibility in human–machine interactions.” *AI Ethics* **2**, 523–532 (2022). https://doi.org/10.1007/s43681-021-00109-5

Obviously, this opens the floor to potential malignant manipulations, which might end up jeopardizing the decision-making process, from individual layer up to democracy-building processes. In fact, AI-powered system can technically substitute humans, by accessing, selecting, and discriminating the info for them, so making their ultimate choice.

In times of world elections such as the current year 2024, involving around of 40% of mankind, this is a particularly dangerous threat. This has been very recently identified as potentially jeopardizing for world democracies: big tech companies are coordinating efforts to mitigate the risks and demolish counterfeited AI-powered systems vowed to manipulate messages, procedures, and processes. In this light, tech giants such as Microsoft, Meta, Google, Amazon, X, OpenAI, and TikTok unveiled a common agreement reached in February 2024 aimed at mitigating the risks that AI will disrupt elections expected in 2024. In fact, the tech industry accord aims at developing AI-generated images, video and audio that might or could possibly deceive voters about candidates, election officials and the entire polling system, process, and procedures.

However, it is also clear enough that this initiative is stopping short of beckoning for an outright ban on such content: in fact, whereas this agreement demonstrates a certain unity of intents expressed by tech platforms with billions of users, it largely outlines initiatives that are already underway and undertaken. In this light, efforts to **detect and label AI-generated contents** could be a desirable, viable, and potentially effective approach, which could become powered by AI-enabled systems themselves. Doing so, those AI-powered tools, technologies, and systems who create the problem could become at least part of the solution. Therefore, **AI-generated content labelling** should be devoted to discriminating between contents generated by AI and those created by humans: this is aimed at enabling, empowering, and guaranteeing transparency about info contents and their associated trustworthiness.[108]

In this sense, a ground-breaking research initiative sounds a true forerunner: it is targeted to conceive, design, and develop AI-based technologies to provide solutions against disinformation, i.e., AI4TRUST.[109] It will provide a hybrid system, where machines mind cooperating with humans, fully relying on advanced AI systems to combat advanced and deep disinformation techniques. This initiative is vowed to support media professionals and policy makers to discriminate between fakes, targeting mis- and disinformation. Its AI-powered

[108] NPR (2024) ''Tech giants pledge actions against deceptive AI in elections'', at : Tech giants lay out plan to fight AI election deepfakes : NPR

[109] EURACTIV (2023): *AI4TRUST: AI-based technologies for trustworthy solutions against disinformation*, at: AI4TRUST: AI-based-technologies for trustworthy solutions against disinformation – Euractiv

system is dedicated to monitor in almost real time, multiple online social platforms: it filters out social noise and analyzes multimodal contents, such as text, audio, visual, across multiple languages, attaining up to 70% of coverage in the EU. Novel AI-powered algorithms are used, which work in close cooperation thru automated systems with an international network of human fact-checkers who are responsible of periodically trigger and provide validated data to feed back into the operational algorithms, thus becoming updated.

In this perspective, in the US a group of big tech companies including OpenAI, Alphabet, and Meta signed in July 2023 a voluntary agreement with the White House to watermark AI-generated contents, which is a first step to disclose their labelling, and in October 2023 the US Executive Order n°14110 instated all US companies to report information to the federal government when training large AI models.[110] Similarly, EU is heading to become the top world regulator on AI, including in its recent AI ACT requirements to disclose copyrighted material used to train generative AI systems, and to label any AI-generated output as such.[111] Last, China follows in an analogous direction, dedicated at regulating all public-facing generative AI, by requiring to watermark AI-generated images or videos, regulations on training data and label quality, restrictions on personal data collection, and also by providing a guideline imposing that generative AI must adhere to socialist core values.[112]

This is a key issue for attaining responsible design, production, demand, supply, and use of AI-powered information. In fact, AI-enabled systems can smartly and cleverly engender virtual realities which can be hardly discriminated from physical reality, due to the flawlessness of the images, sounds and tactile experiences they are able to impart, infuse and evoke. So far, they are capable to stimulate, vellicate, and tantalize at least three out of the five human senses, i.e., sight, earing, and touch. As their sensations, can be shrewdly aroused, mirrored and mimicked by AI, which can ingeniously induce, evoke, and provoke, it is quite tough for humans to distinguish them from those stemming from the physical and authentic reality. Likewise, it is very challenging to differentiate AI-generated from human created contents.

This is particularly evident from appreciating and assessing some jolly hilariously depicted images, which stems from paradoxical AI-generated images: these are particularly well illustrated by relying on ensemble learning models, which combine different AI models together: the effect is almost powerful in case the originating models differ well enough in their predictions. For instance, the

[110] Wikipedia (2024): *Generative AI – Law and Regulation*, at: Generative artificial intelligence - Wikipedia
[111] *Ibidem*
[112] *Ibidem*

imageries below portrayed as a mere title of example: quite seemingly absurd or self-contradictory indeed, though drolly entertaining, and humorous.

AI-generated Stable diffusion, prompt a photo of an astronaut riding a horse.
From: Generative artificial intelligence - Wikipedia

Examples of AI-generated contents. Reworked by the author thru https://openart.ai/create

Examples of AI-generated contents. Reworked by the author thru https://openart.ai/create.

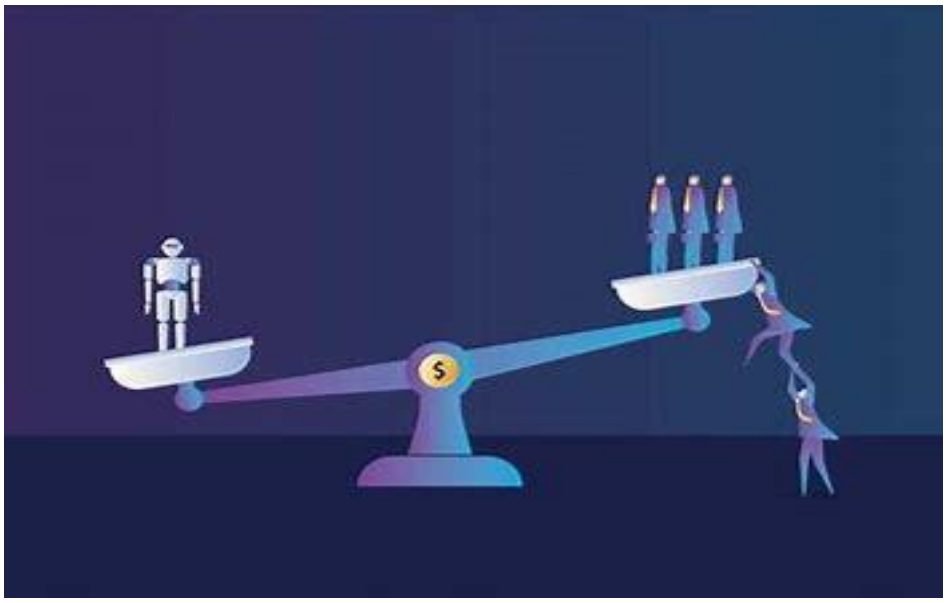
Examples of AI-generated contents. Reworked by the author thru https://openart.ai/create

This also evidently claims for the need to design and promote future research on novel AI digital literacy to conceive, design, and develop innovative **education** settings and programs. These should be vowed to instruct and teach information consumers and users on strategies and tactics vowed to face effectively and proactively AI-powered sensory-driven manipulations of perception, thought, decision, and choice-making processes.

So, novel, ground-breaking, and pioneering digital literacy models for education to discriminate between AI-generated and AI-created contents are consequentially needed. In this light, promoting a healthy and aware *skeptical indifference* might be useful: its is vowed to retrench, downsize, and even

invalidate the importance of the sensory perception associated with the received information, ultimately putting into discussion their credibility. This view, approach, and attitude should be therefore assimilated to Thomas Aquinas' concept of "*straw*": although intelligible, it deals with nonetheless useless information, being irrelevant to both physical and metaphysical realities.[113]

This is not an inconsequential discussion: AI-supported systems which were not designed to support human-centricity can negatively affect public health, namely mental health, raising issues in applying the principle of distributed responsibility therein. The recent cases of AI-supported online platforms harming mental health in youngsters is particularly enlightening, as herein AI uptake was dominant in marketing and sales purposes, while human-centricity was fully neglected.



In this light, it sounds now crystal-clear that the real point is realigning AI-systems' objectives with human-centric objectives: this is the key ethical, legal, and social issue, whose research will become pivotal to frame new models for responsibly shaped AI-systems. In fact, raising, attaining, and keeping **trustworthiness** of AI-supported science, research and technological innovation systems is crucial for their responsible acceptance in society, economy, industry, sustainability, politics, and culture: solely if responsibly shaped, they can be trustworthily accepted, thus dutifully embedded.

Therefore, AI enabling science, research and technological innovation systems should become '**responsible-by-design'**: this sounds the ultimate and most urgent condition needed for developing responsible AI-powered science, research, and innovation, requiring innovative settings from ethical, legal, and

[113] Sanders, F. (2010): "Thomas Aquinas big pile of straw," *The Daily Scriptorium*. At : Thomas Aquinas' Big Pile of Straw - The Scriptorium Daily

social disciplines. This means to responsibly design AI systems by fulfilling specific objectives sternly defined by humans: (i) on the one side, they should not target the internal goals they may engender; (ii) on the other side, they should operate to pursue meticulously defined human-centric purposes. They should be essentially vowed to act in the best interests of humans, by simultaneously pursuing human-centric objectives and disregarding the internal goals generative AI systems might create themselves by mimicking human learning patterns. For becoming responsible, AI-systems should serve humans, and not vice versa: empowering and enabling humans, whereas not enhancing nor substituting them.

In this light, the discernment about the appropriateness of AI-systems' goals take root from the inmost notion of "human responsibility" which stems from human free will; this last should clearly identify those human-centric goals towards which responsible AI should be targeted.

Free will can only be human:[114] in fact, it typifies human beings, as it stems from the inner intangible gift humans are endowed with, which are preconditions for exerting responsibility, which in turn generates free will: they are conscience, emotions, feelings, consciousness, self-awareness, intellect, metaphysical thought, and discernment. All of them entail the moral duty and legitimate oath humans have to use them for good, in virtue of guaranteeing their inherent right to exist, which by definition they deserve and exert.[115] Artificial agents are neither equipped nor awarded with them, although the gradualist conception[116] of

[114] Reworked from: (i) Perrin, Ch. (2011). "J.P.Sartre: condemned to be free", *Filozofia* 66:209-221 (2011) https://philpapers.org/rec/PERJPS-2 ; (ii) Britannica, *Existentialism*, https://www.britannica.com/topic/free-will

[115] Reworked from: Bonazzi, M., (2004): *Sustainable Development: the Need for a New Ethics*, pp. 53-54 and back cover. Óleo-LIFE Project LIFE 99/E/ENV/000351, EC DG ENV, Centre for Environmental Strategy of the University of Surrey, Guildford (U.K.) and AEMO, Jaén, Spain.

[115] Reworked from: Strasser, A. (2022). "Distributed responsibility in human–machine interactions." *AI Ethics* **2**, 523–532 (2022). https://doi.org/10.1007/s43681-021-00109-5,

[116] Reworked from: Peña, L. and Txetxu A. (2014), "Los grados del vivir", in *Bioética en plural*, ed. by M. Teresa López de la Vieja. México/Madrid: Plaza y Valdés. ISBN 9788416032310, and https://en.wikipedia.org/wiki/Lorenzo_Pe%C3%B1a#Contradictorial_gradualism

AI-powered machines attempts to see or interpret them as moral agencies, thus neglecting the intimate role these gifts play in shaping responsibility which can wield free will.[117]

In this light, it is sufficiently clear to what extent AI would become a disruptive and pervasive set of systemic technologies able to impact on various dimensions of human society, economy, industry, sustainability, politics, and culture at large. So, it would be appropriate, that forward-thinking and far-sighted policies should set up a framework for an extensive communication action to shape and enable a broader societal dialogue on AI. Both should focus on addressing, analyzing, and identifying to what extent benefits, threat, prospects, and limits of AI could be trustworthily and trustfully promoted and accepted in the EU and beyond. In fact, building on trustworthiness of responsible-by-design AI and its societal acceptance is likely to become a crucial process to facilitate its responsible uptake and embedment at production, supply, and consumption levels.

In fact, beyond any spontaneous enthusiasm or mistrust any highly innovative scientific and technological development related to AI may bring, the fact that AI is becoming more and more deeply embedded in today's life should warrant a meaningful, attentive, honest, and conscientious communication based on continuous participation and dialogue between EU institutions and citizens. This should aim at identifying to what extent benefits, threat, prospects, and limits of AI could be trustfully promoted and accepted. Thus, taking the lead to develop such a dialogue, the EU would endeavor one of its more utmost moral responsibilities.

In this light, involving Europeans in appropriate communication, dialogue and engagement on AI is a real asset to the EU, whose aim should be aligning AI development with the people's expectations and concerns, at the same time paving the way for a level playing field in the global market. In this sense, a call to policy action becomes an utmost need: in the old world of the public understanding of science, there was often a monologue top-down approach where non-expert opinion had no role to play.

However, with the increasing recognition that dialogue and multiple inputs are crucial factors in underpinning sound policy making in science, research, and technology, as well as their acceptance in society, it has become evident that multi-way communication is the most robust way to address dilemmas raised by novel science and the associated technologies. In fact, it is now consensually assumed that *'science is too important to be left to scientists. Their knowledge and their assessment of risks is only one dimension of the challenge for society.*

[117] Reworked from: Strasser, A. (2022). "Distributed responsibility in human–machine interactions." *AI Ethics* **2**, 523–532 (2022). https://doi.org/10.1007/s43681-021-00109-5

When science raises profound ethical and social issues, the whole of society needs to take part in the debate.'[118]

So, more EU research would be applauded on designing and implementing a framework for developing appropriate communication, societal dialogue, and engagement of communities and citizens to decide on which kind of responsible and trustworthy AI to head towards. In past decades, attaining trustworthiness of cutting-edge technologies has been robustly acknowledged to be crucial for their responsible societal acceptance. This could be framed thru an openminded, consistent, and even audacious communication framework dedicated to bringing everyone in, i.e., ***Communication Roadmap on Responsible-by-design AI***. In this sense, good governance on AI would depend and rely upon an appropriate communication as ultimately pre-requisite for attaining engagement of both communities and citizens into an appropriate societal dialogue on responsible AI.

Therefore, far-sighted policies should be pushing this bold principle towards building up a broad, informed, and responsible consensus to support the uptake and embedment of trustworthy and responsible AI in sciences, research and technologies and related industries, including both production, supply, and consumption patterns.

The core challenge here is about engaging society in an inclusive dialogue able to identify desirable patterns for responsible and trustworthy AI design, application, and use. If opportunities, risks, and uncertainties were properly addressed, policies would probably become closer to the mark of reaching informed and responsible consensus: in this light, the best strategy for developing a

[118] UK Parliament, House of Lords (2000). *Science and Innovation White Paper 'Excellence and Opportunity, a science and innovation policy for the 21st century'.* UK Parliement, Hansard, Lords. https://hansard.parliament.uk/Lords/2000-07-26/debates/5bf52b1b-611f-4e8f-9dd4-62e9f378efd8/ScienceAndInnovationWhitePaper

Communication Roadmap on Responsible AI should aim at creating a lively communication relationship and a continuous dialogue between institutions and citizens. Every audience, be it industry, business, organizations, NGOs or, more broadly, the lay public, will be increasingly called upon to get involved at European, national, and local levels. As a result, good governance through inclusive policy debate will be promoted.

All these issues should be addressed, analyzed, structured, and packaged into a specific communication and dialogue model at policy level that relates to citizens' concerns and needs. By building on knowledge and awareness of responsible AI, its communication roadmap would come forward with a whole system of organized mechanisms designed to prepare the ground for very effective feedback and exchange with the whole society.

By building on knowledge and awareness of responsible AI, this Communication Roadmap on Responsible AI would come forward with a whole system of organized mechanisms designed to prepare the ground for very effective feedback and exchange with society. By placing European citizens at the center of attention, it tries to design a feed-back-feed-forward mechanism to greatly enhance the EU's policymaking efforts in promoting and safeguarding the future of responsible AI as a strategic tool for sustainable prosperity and growth. It also aims at treating responsible AI as a critical component that is bound to bring to the fore people's relationship with high technology developments, by advancing the concept of sciento-technological democracy in a human-centric perspective.[119]

In this light, the roadmap framing communication and dialogue actions could be structured across different steps:

[119] Reworked from: (i) Bonazzi, M., (2010). *Communicating Nanotechnology – an Action packed Roadmap for a brand new Dialogue*; European Commission, EUR n°: 24055; ISBN: 9789279134135, at: http://ec.europa.eu/research/industrial_technologies/pdf/communicating-nanotechnology_en.pdf ; (ii) Bonazzi, M., (2013). *Communicated Nanotechnology: outreach, dialogues and education within civil society*. Internal EC use: catalogue n°: KI-NA-24-962-EN-C. Public use ISBN: 978-92-79-21477-6, EUR 24962, DOI: 10.2777/77541.

(i) appropriate communication on AI should come first, which requires a sound and clever method: it is pivotal to state whom communication on AI should be reaching out to, since audiences are many.
(ii) then, envisaging the expected impact would follow, to make key audiences and stakeholders (i.e., those having a specific interest) feel involved and eager to know more to engage in taking proper decisions.
(iv) further on, anticipating how to get the messages across to meet the communication needs of the lay public will be the next communication step.
(v) finally, dialogue with citizens and both community and citizens' engagement are the ultimate and crucial phase: in fact, the previous communication steps would enable building-up public awareness and trust; this is committed to supporting a trustworthy societal dialogue exercise on responsible AI for its long-term development, by engaging all parts to allow EU to profit from its potential benefits, simultaneously circumventing the potential associated risks.

A bottom-up approach is therefore needed therein, seeking a dynamic, constant, and continuous communication and dialogue model. Therein, those striving to communicate the potentialities of novel AI science and associated technologies would also listen to the perceptions, concerns, and expectations of the audiences and engage into a discussion with them. Clearly, diverse degrees of interest, sensitiveness, and creativity are needed. They are valuable plus, as communication and dialogue require ears as well as voices: indeed, the number of ears should double the number of mouths, as several ancient traditions suggested in their own time.

Summarizing, future forward-sighted policies on responsible AI thru the proposed Communication Roadmap on Responsible AI should focus on actions dedicated to: (i) communicating on AI by addressing diverse dimensions, actors and stakeholders with the proper tools; (ii) promoting awareness actions on

responsible AI as part of the fabric of society; (iii) setting up an open dialogue, as well as a community and citizens' engagement on AI with and within society; (iv) building-up frameworks to attain social consensus on responsible AI between stakeholders, society and policymakers; (v) fostering societal confidence and trust on responsible AI by enhancing the policy makers image as impartial, transparent, trustworthy and reliable communicators on AI.[120]

[120] *Ibidem*

Summarizing: nurturing inventive AI-scienced governance

Likewise analogous issues raised in the past decades by debates on nano-biosciences and synthetic biology, prospects for AI-enabled sciences, research, technologies, and related industries are tantalizing human imagination, hopes and expectations: novel scenarios are expected, encompassing benefits and risks for human society, economy, industry, sustainability, politics, and culture at large. In fact, AI is expected to become a key driving force therein: so, it should be ensured that AI-driven technological advancements could lead to shared and net-positive outcomes worldwide, thus requiring to frame both scientific research and technological innovation into relevant guardrails to guarantee their human-centricity.

On the one hand, the EU should harness AI and ensure it is used responsibly.[121] As a matter of fact, due to its tremendous potential, AI will be crucial for future world science, research, and innovation at large, and this is already especially evident in augmented medicine and healthcare as strategic application areas.[122] So, the EU should be doing more on this, especially investing in industrial data wealth of unrivalled quality struggling to translate research results into marketable outputs, upshots, and outcomes, thus boosting its worldwide competitivity.

On the other hand, beside becoming an increasingly alluring industrial and socioeconomic opportunity, AI could become socially, culturally, and ethically accepted only if used responsibly. In fact, AI has been ranked as top risk globally for the next decade, because they often involve 'black boxes' issues, where it is unclear how their outputs are generated and come from.[123]

Summarizing, a generous dose of healthy skepticism is therefore pivotal in approaching outcomes from AI-mediated research: AI tools cannot be interpreted as fully reliable tools, without questioning the outcomes stemming from their application, as this depends on what type of models and data an AI tool has been trained on.

Last, improving, boosting, and promoting communication, societal dialogue, and engagement on AI is essential: in fact, a widespread progressive loss of trust in research and science at large is becoming an increasingly serious issue over the

[121] World Economic Forum (2024). "Europe must up its game on AI", Ursula von der Leyden speech, Davos, at: https://www.researchprofessional.com/0/rr/news/europe/innovation/2024/1/Europe-must-up-its-game-on-AI--says-Commission-president.html#sthash.xKTjcXPH.zCpydNMd.dpuf

[122] World Economic Forum (2024); interventions from ERC's Maria Leptin and Magdalena Skipper from ''Nature'' journal, *ibidem*.

[123] CNBC (2024). "Davos updates: Global leaders discuss AI adoption and potential threats." McKeever Lucy Handley, on 15th January panellists.

last years, especially from COVID pandemics:[124] this mainly result from both misinformation – which is incomplete or inaccurate information – and deliberate disinformation, in some cases stemming from industries' vested interests to undermine or invalidate science results and credibility, e.g., those on climate change.[125]

In this light, preventing loss of public trust in research and science is becoming an increasingly crucial political priority for the EU, as it can jeopardize the objectivity and credibility of the innovation outputs associated with science, research and innovation. Consequently, including more research and training on communication, data safety, privacy and ethics is crucial to keep up public trust with the pace of AI driven scientific and technological changes. So, more resources are required, as they are needed to improving researchers' communication skills and activities: they need to become better communicators about their methods and results to help restore and keep trust in research and science. In this light, the EU should take the lead on boosting communication, societal dialogue, and engagement on responsible AI.

All these considerations enable summarizing these succinct recommendations dedicated to imbuing foresight into EU policies on AI, described as follows.

- AI is expected to become a disruptive and pervasive set of systemic technologies, as ubiquitous as the internet, impacting on most dimensions of human society, economy, industry, sustainability, politics, and culture: so, it is crucial to learn from past successes and failures of the digital revolution. So, debates over what it means to be "human-centered" and which values should guide human societies will shape responsible engagement of both communities and citizens with AI. Focusing on shared values such as diversity, inclusiveness, democracy and peace, policymakers and technologists should outline principles for designing, developing, and implementing inclusive and responsible AI tools. As a matter of fact, this integration requires engagement with communities and citizens, as well as the related commitment to equity and respect of human rights.[126]

- Quite widespread consensus has been reached in diverse worldwide forums, such as the 2024 World Economic Forum in Davos, Switzerland, on the fact that the EU is severely lagging behind US and China on AI, where Europe doesn't play a very significant role on applications: in fact,

[124] World Economic Forum (2024). "Communicate to rebuild trust in science", 16th January Panel. See more at: https://www.researchprofessional.com/0/rr/news/europe/politics/2024/1/Communicate-to-rebuild-trust-in-science--urges-Davos-panel.html#sthash.fKC0UunH.MQknUnc5.dpuf

[125] World Economic Forum (2024). Intervention of Naomi Oreskes, professor of the history of science at Harvard University in the United States, *ibidem*

[126] Botti, Y., and Vilas Dhar, L. (2024): "Will 2024 be the year of responsible AI?", *Irish Examiner*, 31 January 2024 issue. More info at Will 2024 be the year of responsible AI? (irishexaminer.com)

the key underlying models for generative AI, such as OpenAI's GPT-4, are all being developed in the US.[127]

- Although it seems that that race is lost, application of these new technologies on important domains such as augmented medicine and healthcare would open novel and actual opportunities for Europe, if EU policymakers, actors, and stakeholders must be acting together. So, the EU could support a limited number of highly ambitious foundation models to be developed at the European scale, funded through dedicated call for proposals and selection procedure. Most promising actions should focus on strategic industry-specific objectives, for instance on AI-models focused on augmented nanomedicine for heath care.

- Consequently, EU could have comparative advantage therein, as EU academic institutions have access to those medical and climate data that could power specialized models; in fact, big tech companies such as Google and Microsoft don't have full access either to medical data and or to the required medical expertise to exploit them.[128]

- AI-based and especially AI generative systems are expected to become increasingly disruptive sets of new knowledge and technologies paving the way for conceiving, designing, and developing unexpected breakthroughs and entirely innovative tools to enhance efficiency in most branches of science, research, and innovation. This is particularly prominent in strategic areas such as augmented medicine and healthcare: therein, the terrific forward-looking AI-powered potential could provide enormous efficiency gains and forward-thinking scientific insights and application outlines.

- Simultaneously, AI-enabled tools and systems may become unruly and unpredictable if they are not properly addressed, as the conception, design and management of their technologies could become increasingly prone and vulnerable to malignant uses: in fact, they are easy to clone and cheap to misuse, thus becoming widely accessible. So, their control may become unpredictable and their impacts on society, economy, industry, politics, and culture at large may turn out into vast rooms for uncertainty.

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[127] World Economic Forum (2024). "Europe must up its game on AI", Ursula von der Leyden speech, Davos, at: https://www.researchprofessional.com/0/rr/news/europe/innovation/2024/1/Europe-must-up-its-game-on-AI--says-Commission-president.html#sthash.xKTjcXPH.zCpydNMd.dpuf
World Economic Forum (2024). Report. The World 2024 Special Report (ft.com)

[128] Matthews, D. (2024). "FP10: scrap missions in favour of AI and solar flagships". *Science Business*, 30th January 2024. Interview to Helmholtz Director Otman Wiestler. More info at: FP10: scrap missions in favour of AI and solar flagships, says Helmholtz head | Science|Business (sciencebusiness.net)

- On the one hand, although increasing sets of studies, analyses, research, assessments, and reflections are being drawn worldwide to explore, identify, categorize, and evaluate potential AI-related risks, more cooperation with academia would be praised, and applauded. So, more research at this level is an utmost need at EU level, to standardize procedures, risk assessment and produce usable outcomes. On the other hand, too few and limited studies and research have been carried out to outline and analyze realistic risk mitigation measures: more EU funded research is clearly needed to bridge this gap.

- In addition to that, more research is needed to address the AI complementary dimensions and cross-impacts in human society, economy, industry, sustainability, politics, legislation, and culture, which all stem from AI-related ethicalities. In fact, although incipient, quite inspiring debate is being raised in terms of both moral practice and legislation on the *responsibility gap* attributed to AI-based systems. In this perspective, humans cannot be hold responsible for actions carried out by AI-governed machines over which they have not enough control.

- Therefore, on the one hand the principle of *distributed responsibility* applies to the first two types of primary AI systems, i.e., reactive and limited memory, assigning diverse degrees and types of responsibility to human agents involved in conceiving, designing, developing, and validating AI systems. Essentially, these AI types are interpreted as tools, they cannot be glossed as moral or social interaction partners, so they are not subject to moral relations.

- However, on the other hand this principle is tough to apply in the last two types of generative AI models, i.e., theory of mind and self-awareness. In fact, they cannot be fully understood nor predicted by humans in their behaviors: it has been put forward that these limited abilities of human beings might absolve them from assuming a greater share of the responsibility. Due to their higher anticipation skills, together with quicker data processing abilities, it has been argued that these two types of generative AI may deserve being endowed with a certain share of responsibility. Because of that, the more artificial systems surpass humans, the more morally responsible they can become, being so glossed as *moral machines*, thus both morally and legally liable. Clearly, this definition sounds almost distorted and disturbing, as it overrides the concept of free will, which stems from the notion of responsibility which exerts it. As this last is grounded on the principles – and gifts – of conscience, intellect, awareness, self, metaphysical thought, and discernment, no responsibility

nor free will can be attributed to AI-enabled systems, as they entirely are lacking these gifts which humans are endowed with.

- In the light of all that, large room for EU funded research is required to apply, deploy, and expand and deepen the principle of *distributive responsibility* applied to generative AI systems: this is expected to become of utmost importance. As these technologies are expected to become evn more pervasive in most layers of society, economy, industry, sustainability, politics and culture, the related governance issues which would arouse should require appropriate frameworks for developing sound moral practices and legal liabilities.

- As a consequence of all these considerations, EU future policy actions should focus on setting up research and scientific frameworks for conceiving, designing, developing and deploying '***responsible-by-design AI systems'***, which means responsibly designed to fulfil specific objectives firmly defined by humans, which is human centricity, i.e., (i) on the one hand, they should not target the internal goals they may engender; (ii) on the other hand, they should operate to pursue meticulously defined human-centric purposes: to serve humans – and not vice-versa – they should be conceived, designed, developed and deployed to acting in the best interests of humans. This should be simultaneously pursuing human-centric objectives while disregarding the internal goals they might be creating themselves by mimicking human learning patterns.

- - Staying on the current path, risks may be perpetuating or worsening the global wealth gap, thus might be further alienating vulnerable communities worldwide: therefore, policies should set up a framework for an extensive and audacious communication action, societal dialogue, as well as communities and citizens engagement on responsible AI, dedicated to bringing everyone in, i.e., ***Communication Roadmap on Responsible-by-design AI***. More EU research would be desirable to decide on which kind of responsible and trustworthy AI to head towards. In the past, developing, attaining, and maintaining trustworthiness in cutting-edge technologies has been demonstrated to be pivotal for their responsible societal acceptance. Solely an openminded, consistent, and audacious communication framework targeted to bring everyone in for promoting and achieving this goal, therefore heading towards good governance models.

- In fact, attaining trustworthiness of cutting-edge technologies such as AI has been robustly acknowledged to be crucial for their societal acceptance, built upon a broad, informed and responsible consensus to support uptake and embedment of trustworthy and responsible AI, by:

(i) communicating on AI by addressing diverse dimensions, actors and stakeholders with the proper tools; (ii) promoting awareness actions on responsible AI as part of the fabric of society; (iii) setting up an open dialogue, as well as a community and citizens' engagement, on AI with and within society; (iv) building-up frameworks to attain social consensus on responsible AI between stakeholders, society and policymakers; (v) fostering societal confidence and trust on responsible AI by enhancing the EU institutions image as impartial, transparent, trustworthy and reliable communicators on AI.

- AI empowerment will be particularly sensitive in the current year 2024, when more than 40% the world's population will prepare to hold elections: combating the imminent surge of mis- and disinformation which could arise upon AI-based models will require prompt and proactive measures. This includes the need for a stronger public awareness, by promoting broad-based media narratives. Also, innovative, ground-breaking, and pioneering digital literacy patterns on AI are desirable for avoiding polarization by emphasizing the importance of empathy and mutual learning. Similarly, innovative education models should be introduced: they should be vowed to design and induce forward-thinking digital literacy models and programs on AI to enable discriminating between AI-generated and man-made contents. This is ultimately dedicated to promoting healthy, conscious, and aware skeptical indifference and avoid manipulation evoked and obtained by AI-generated fakes and counterfeits.

Clearly, in analogy with the issues raised by debates on cutting-edge technologies in the past decades, e.g., nanobiotechnologies and synthetic biology, responsible AI would require a strictly sound and ethical approach: open communication, societal dialogue, as well as engagement of communities and citizens should aim at building informed and responsible consensus therein: so, policies should become straightforward, forward-thinking, and perspicuous about that.

Conclusions: pioneering philosophical discernments on AI visions, concepts, and challenges

The phraseology Artificial Intelligence (AI) tantalizes our imaginaries, insinuating the temptation to infer, and finally believe, that humans can create something "*in their own image and likeness*",[129] therefore as much as possible human-like. Since the origin of documented thought, this enticement has been the most typical prerogative of gods: according to Genesis, it is the primigenial and authentic most ancient temptation, i.e., to become as god.[130] So, quite fanciful: creating intelligence is definitely playing God, which psychology tells us as stemming from one of the childhood's most studied ambitions of being or becoming almighty.[131] This terminology clearly evokes the desire, aspiration, or even slumber, of rendering man-made systems enabled to autonomously engender info collection, interpretation, thinking, choosing, making decisions, and acting on the basis of their own discernment.

If so, this would thus lead to liberate humans from the inner weight of their free will, sometimes excruciating as it involves the innermost possibility of making errors. According to Jung, slumbers are the psyche's attempt to communicate crucial things to the individual, who values or over-values them above all else.[132] So, entirely entrusting to man-made systems automatized info gathering, interpretation, discernment, and decision-making would finally end up into delegating the man's responsibility to machines. So, abdicating responsibilities of inferring, deducing, interpreting, choosing, and deciding about what is acceptable or not sounds an elegant practice of escape from freedom[133].

In fact, freedom scares humans due to its inward potential to lead to making mistakes, sometimes disastrous[134]. Likewise other mythopoetic cultural traditions and systems, Greek mythology shaped this quite attractive lure into the myth of Talos, which was a defensive automaton capable to autonomously interpret, discern and decide about external inputs.[135] However, the notion of intelligence subsumes the discernment's capability of discriminate between good and bad: this involves the principle of moral responsibility, which enables to exert the free will. Both concepts fall into the sphere of construal discussed by universally accepted ethics.[136] From all that above, it might be misleading to re-use the quite

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[129] Bible,Genesis, 1:27: *"... man in his own image and likeness".*
[130] Bible,Genesis, 3:5: *"... you will be like God, knowing good and evil"*
[131] Reworked from: Freud, S., (1899) "L'interpretazione dei sogni" in Opere, vol. 3, Torino, Bollati.
[132] Reworked from: West M., 2011, *Understanding Dreams in Clinical Practice*, Karnac Books, https://www.marcuswest.co.uk/information/Dreams/
[133] Reworked from: Fromm, E., 1941, *Escape from Freedom*, Farrar & Rinehart, US.
[134] *Ibidem*.
[135] Pseudo-Apollodorus. *Bibliothēkē Βιβλιοθήκη [Library]. 1.9.26.*
[136] Reworked from: (i) Bonazzi, M. (2006). Reconstructing man? The power of converging technologies, Cordis Wire, 15.11.2006, Converging Technologies https://cordis.europa.eu/wire/index.cfm?fuseaction=article.Detail&rcn=11117 ; (ii) Bonazzi, M., (2010).

inspiring and evocative concept of 'intelligence', without defining to what extent and for which purpose this term is attributed or extended to AI, and how it operates into inherently machine-driven systems.

For doing that, framing an articulated philosophical premise is imperative: generally speaking, at least from the pre-scientific empiricist perspective, concepts without perceptions are empty, as alone they cannot constitute knowledge:[137] humans do not know reality as it might be "in itself" (i.e., *noumena*[138]), whilst authentic knowledge stems from human thoughts which structure, organize and shape experiences obtained from reality.[139] Therefore, epistemologically speaking, the AI terminology can be roughly defined as a set of man-made systems of info and data gathering, processing, interpreting, and enabling choice-making, thus creating new knowledge sets.

In fact, AI is created by humans and is lingering within humans, whose reality is perceived by humans as intelligence, or at least its mirroring or mimicking simulations.[140] In this light, the philosophical standpoint associated with the etymon 'intelligence' should be made clear from the very beginning: etymologically speaking, it stems from Latin phraseology *intus-legere* [141](i.e., to read inwardly). So, assuming this conceptual construal of intelligence, AI-powered systems should be able to obtain, recognize, process, interpret info and data to take consequential decisions by reading inwardly and within info: so, mimicking human discernment – at least up to a certain degree – they beforehand engender, and afterward use the novel knowledge they have generated[142]. Therefore, they should be, stay or become human-centric: this hermeneutics pinpoints the importance of how and to what extent this novel knowledge is AI-

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Communicating Nanotechnology – an Action packed Roadmap for a brand new Dialogue; European Commission, EUR n°: 24055; ISBN: 9789279134135, at: http://ec.europa.eu/research/industrial_technologies/pdf/communicating-nanotechnology_en.pdf

[137] Reworked from: (i) Hume, D., 1739–40, *A Treatise of Human Nature*, ed. David Fate Norton and Mary J. Norton, The Clarendon Edition of the Works of David Hume, Oxford: Oxford University Press, 2011: (ii) Quine, W. V. O., 1951, "Two Dogmas of Empiricism," in W.V.O. Quine, *From a Logical Point of View*, Cambridge, MA: Harvard University Press, 1951.

[138] *(The) Encyclopedia of Philosophy* (Macmillan, 1967, 1996) Volume 4, "Kant, Immanuel", section on "Critique of Pure Reason: Theme and Preliminaries", p. 308 and *ff*.

[139] Reworked from (i) Hume, D ., 1748, *An Enquiry Concerning Human Understanding*, ed. Tom L. Beauchamp, The Clarendon Edition of the Works of David Hume, Oxford: Oxford University Press, 2000; (ii) Locke, J., 1690, *An Essay on Human Understanding*, ed. Peter H. Nidditch, 1975; (iii) *(The) Encyclopedia of Philosophy* (Macmillan, 1967, 1996) Volume 4, "Kant, Immanuel", section on "Critique of Pure Reason: Theme and Preliminaries", p. 308 *ff*.

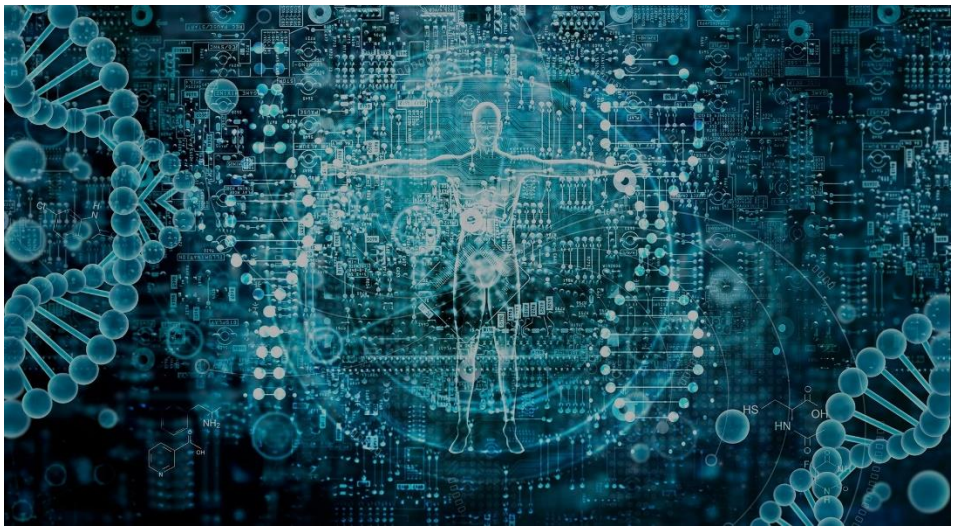
[140] Reworked from: (i) Kant, I., 1783, *Prolegomena to Any Future Metaphysic*, Jonathan Bennett (trans.), PDF available online at Early Modern Texts ; (ii) Plato, *Meno*, W. K. C. Guthrie (trans.), *Plato: Collected Dialogues*, edited by Edith Hamilton and Huntington Cairns, Princeton: Princeton University Press, 1973.

[141] Reworked from: (i) Università degli Studi di Trieste (2019), *Intus legere*, Simposi Multidisciplinari, https://www.units.it/news/intus-legere-simposi-multidisciplinari ; (ii) Bonazzi, M., (2010). *Communicating Nanotechnology – an Action packed Roadmap for a brand new Dialogue*; European Commission, EUR n°: 24055; ISBN: 9789279134135, at: http://ec.europa.eu/research/industrial_technologies/pdf/communicating-nanotechnology_en.pdf

[142] Reworked from Government Technology (2023), *Understanding the four types of AI*, in https://www.govtech.com/computing/understanding-the-four-types-of-artificial-intelligence.html

created, as well as for what purpose and from which sources. Under these premises, if this notion was actual intelligence, ethics therefore applies.

Ethics subsumes principles of both liberty and responsibility for discerning and choosing between good and bad, truth from falsehood, wisdom from foolishness:[143] mere materialist purposes and dynamics are not per se sufficient to guarantee ethically acceptable operational standards.[144] It is therefore crucial to identify, define and disclose: (i) for what purpose, (ii) doing what and (iii) how do operate AI-systems, whose mathematical constructs, i.e., algorithms, are *per se* and *in se* programmed to discern between right or wrong – and not between good and bad – to identify what is acceptable or not. In fact, their teleology[145] should reveal for which purpose and in which way they are conceived, designed, and developed, what are their final operational outputs, scientific and technological outcomes, as well as which are their socioeconomic and cultural upshots in terms of attaining human-centricity.



[143] Klein, Daniel B. (1997). "Liberty, Dignity, and Responsibility: The Moral Triad of a Good Society", *The Independent Review*
Vol. 1, No. 3 (Winter 1997), pp. 325-351 (27 pages), Published By: Independent Institute, https://www.jstor.org/stable/24561099

[144] UNC, College of Arts and Science – Philosophy (2023). "Liberty, Rights and Responsibilities: introduction to social ethics and political thought", PHIL 170.001, https://philosophy.unc.edu/undergraduate/undergraduate-courses/spring-2020/phil-170-001-liberty-rights-and-responsibilities-introduction-to-social-ethics-and-political-thought/

[145] Reworked from: (i) von Foerster, Heinz. 1992. "Cybernetics." P. 310 in *Encyclopedia of Artificial* Intelligence 1, edited by S. C. Shapiro. ISBN 9780471503071.; (ii) Dubray, Charles. 2020 [1912]. "Teleology." In *The Catholic Encyclopedia* 14. New York: Robert Appleton Company. Retrieved 3 May 2020. – via *New Advent*, transcribed by D. J. Potter; (iii) Ayala, Francisco (1998). "Teleological explanations in evolutionary biology." In *Nature's Purposes: Analyses of Function and Design in Biology*. Cambridge: MIT Press. (iv) Allen, Colin (2003). "Teleological Notions in Biology". *Stanford Encyclopedia of Philosophy*; (v) Aristotle, *Metaphysics*, 1050a9–17, in https://iep.utm.edu/aristotle-metaphysics/; (vi) Hanke, David (2004). "Teleology: The explanation that bedevils biology". In John Cornwell (ed.). *Explanations: Styles of explanation in science*. New York: Oxford University Press. pp. 143–155. ISBN 0-19-860778-4. Retrieved 18 July 2010; (vii) Plato (1966) [1925]. *"Phaedo, by Plato, full text (English & Greek)"*, pp.98-99. Plato in Twelve Volumes. Translated by Harold North Fowler. Introduction by W.R.M. Lamb. Cambridge, MA & London, UK: Harvard University Press & William Heinemann Ltd.

Eventually, these questioning are the ultimate and vital AI-related issues, as around them the inner rationale and whole human-centricity of AI pivots. So, both justification and trustworthiness of AI rely upon the interdependent veracities of the above-quoted assumptions. Clearly, this dynamic could become distorted, if it overrides the principles of conscience, intellect, self-awareness, metaphysical thought, discernment: these notions – or human faculties – structure, imbue, and root for responsibility on which free will relies upon to be properly exerted.

In this sense, as an inclusive vision, AI can be summarized as an embracing set of ICT-based systems displaying outputs, outcomes, and behaviors dedicated to mimicking human intelligence, becoming responsible under condition of mirroring it with human-centric purposes. By perceiving and analyzing their environments thru big data and info acquisition, recognition, processing and interpretation at breakneck speed, AI-powered systems would enable taking informed decision for achieving complex goals, generating content, feedback, predictions, recommendations, choices, or decisions which influence the environments they interact with.[146] In fact, they can provide and process feedback to upstream modulate data acquisition and elaboration, therefore adapting the decision-making models and patterns which they downstream undertake. In this light, AI has been interpreted as *a different kind of intelligence*:[147] However, their intellectual, etymology, and philosophical construal require attention, as using the wording 'intelligence' needs further discussion.

In fact, on the one hand, the term 'intelligence' could stem from the Latin expression "*intus legĕre*",[148] i.e., inwardly reading,[149] or to read within, which

[146] Reworked from: (i) *AI for nanotechnology, AI for nanobiotechnology*. Eds; Silvia Faré, Sorin Melinte, Adriele Prina-Mello (2023) https://www.frontiersin.org/research-topics/31068/ai-for-nanobiotechnology; (ii) FORBES (2023) *Five predictionas about AI for the near future* (Author: Gaurav Tewari) , Forbes Business Council, at: https://www.forbes.com/sites/forbesbusinesscouncil/2023/02/28/five-artificial-intelligence-predictions-for-the-near-future/?sh=29036f7e5f18 (iii) Furht, B., & Escalante, A. (2010). *Handbook of cloud computing*. New York: Springer; (iv) Jarrahi, M. H., Askay, D., Eshraghi, A., & Smith, P. (2023). "Artificial intelligence and knowledge management: A partnership between human and AI." *Elsevier Business Horizons*, vol. 66 Issue 1, January–February 2023, Pages 87-99, https://www.sciencedirect.com/science/article/pii/S0007681322000222 ; (v) Samoili, S., Lopez Cobo, M., Gomez Gutierrez, E., De Prato, G., Martinez-Plumed, F. and Delipetrev, B. (2020), AI WATCH. *Defining Artificial Intelligence*, EUR 30117 EN, Publications Office of the European Union, Luxembourg, 2020, ISBN 978-92-76- 17045-7, doi:10.2760/382730, JRC118163; (vi) von Foerster, Heinz. 1992. "Cybernetics." P. 310 in *Encyclopedia of Artificial* Intelligence 1, edited by S. C. Shapiro. ISBN 9780471503071; (vii) https://ec.europa.eu/newsroom/dae/document.cfm?doc_id=584

[147] Reworked from: (i) CNN (2023), "Eric Schmidt: AI is not ready to take profound decisions", interview to E.Schmidt on AI, podcast on CNN Business, 23 March 2023, https://edition.cnn.com/videos/business/2021/11/03/eric-schmidt-artificial-intelligence-ethics.cnnbusiness ; (ii) (The) Economist (2021)."Schmidt and Kissinger take on AI", https://www.economist.com/books-and-arts/2021/11/20/henry-kissinger-and-eric-schmidt-take-on-ai; (iii) Kissinger E.A., Schmidt, E. and Huttenlocher D. (2021). *The age of AI: and of our human future*, Little, Brown and Company, New York, Boston, London.

[148] Marchesini, R., Celentano, M. (2021). *Intus-Legere*: Knowledge as an Actualization Process. In: Critical Ethology and Post-Anthropocentric Ethics. Numanities - Arts and Humanities in Progress, vol 16. Springer, Cham. https://doi.org/10.1007/978-3-030-74203-4_6

[149] Università degli Studi di Trieste (2019), *Intus legere*, Simposi Multidisciplinari, https://www.units.it/news/intus-legere-simposi-multidisciplinari

Pope Francis I assimilated into the second gift endowed by the Holy Spirit, i.e., namely "understanding".[150] On the other hand, the term "intelligence" might also derive from another Latin expression, i.e., *intelligĕre*, composed by *inter* «in between» and *legĕre* «to clutch», thus denoting the capability to seize and grasp between categories.

At this very point, a digression is impelling, as intelligence and intellect are contrasted by etymology, though both are derived from the Latin composed etymons. On the one hand, stemming from the present active participle of *intelligere*, the term *intelligence* denotes the action of "inwardly reading subject", or, similarly, the "grasping subject". On the other hand, the term *intellect* derives from the past participle of *intelligere*, indicating "what has been inwardly read", or, similarly, "what has been grasped". Therefore, intelligence relates to the creation of new categories of understanding, based upon similarities and differences, while intellect relates the ability to get existing categories understood.[151]

Consequently, attributing any kind of intelligizing process[152] to AI would entail the action of taking it either into intelligence – i.e., faculty of grasping and understanding – or into the intellect – i.e., what has been grasped. On the one side AI can only choose between teleological categories of 'right or wrong', as they are defined and discriminated on the basis of its foundational algorithms. On the other side, AI cannot certainly exert the ability to opt between teleological categories of 'good and bad': in fact, this implies the principle of responsibility, which relies upon and subsumes mental and psychical human faculties such as conscience, self-awareness, feelings, emotions, intellect, metaphysical thought, discernment, thus enabling to exert the free will.

In fact, either the process sprouting from intelligence or that originated from intellect subsumes the use of these mental and psychical faculties, which are founding conscience, awareness, and self-awareness: there are relying upon both mind and psyche, which are fully strangers to conventionally defined AI.[153] In this light, attributing the terms 'intelligence' or 'intellect' to the conventional concept of AI sounds almost inappropriate, even somewhat abusive.

In this sense, thanks to their foundational algorithms AI-powered systems are solely enabled to quickly become reprogramming their patterns and choices, basing themselves of what they learn from external environmental stimuli. So,

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[150] Pope Francis (2014): *General Audience 30 April 2014*, at: General Audience of 30 April 2014 | Francis (vatican.va)
[151] Bohm, David and Peat, F. David (1987): *Science, Order, and Creativity*, p.114.
[152] Oxford English Dictionary - OED (2010): "Intelligize": *transitive verb* at: intelligize, v. meanings, etymology and more | Oxford English Dictionary (oed.com)
[153] Treccani (2024): Intelligenza, at: intelligere - Treccani - Treccani and Ricerca per intelligenza - Treccani - Treccani

due to their abilities to quickly gather, assess, interpret enormous amounts of data and info they promptly take consequential decisions. In this light, AI should be more appropriately delineated as *'a set of artificial systems for info gathering, interpreting and deciding*'. So, it would be more intellectually honest to define her as ***"artificial logics"***, as it discriminates between right or wrong, whilst not between good and bad. Doing so, it is essentially vowed to assist – not substitute – human intelligence, thus it might also be synthetically glossed as "**artificial logics for Assisting Intelligence**", abbreviated as AI too.

However, as conventional AI definition is almost widely well-received, consolidated and accepted, using this term should be kept in the proper perspective of its inner limits and potentialities. In this light, it should not be overlooked that AI conception, design and development is essentially oriented towards boosting: (i) efficiency optimization; (ii) mass-customization of goods and services production; (iii) mass-customization of their use; (iv) humanization of labor and production processes; (v) reduction of both waste and environmental footprint. All these dynamics are altogether vowed to expand and even open novel human-centered production systems and markets:[154] in fact, AI uptake demonstrated to become dominant in marketing and sales applications:[155] so, nothing too theoretically speculative, nor transcendental indeed.

In fact, AI is going to stay with and within the development of human society, whose actual and hypothetical impacts are still difficult to outline nor infer. It is likely to come up with a largely unpredictable range of vast and novel capabilities, whose outcome and effects on humans are not fully understood yet, and whose influences on the societal discourse could be huge.[156] Currently, AI is likely to become a disruptive and pervasive set of technologies able to impact on various dimensions of society, economy, and culture in both the EU and beyond. So, an extensive communication effort is needed on policy side to enable a broader societal dialogue to take place, vowed to identify benefits, threat, prospects and limits of societal acceptance of present and forthcoming AI applications.

In fact, like the patterns shaping and governing human thought, which are tough to identify, feature and predict, also AI-based models and pathways inspiring AI-based decision-making processes are impossible to be univocally characterized,

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154 Reworked from: (i) Østergaard Esben H., 2018. *Welcome to Industry 5.0*, ''Universal Robots''; (ii) Decker, M., 2021, *Next Generation of Robots for the Next Generation of Human*, Elsevier Science Direct; (iii) Decker, M. at al. 2017. "Service Robotics and Human Labor: A first technology assessment of substitution and cooperation, in *Robotics and autonomous systems*, Volume 87, January 2017, Pages 348-354 Elsevier.

155 Reworked from: (i) FORBES, (2019). "Ten charts that will change your perspective in AI in marketing". https://www.forbes.com/sites/louiscolumbus/2019/07/07/10-charts-that-will-change-your-perspective-of-ai-in-marketing/; (ii) CIO (2023) *CIO vision 2025 – Bridging the gap between BI and AI*, MIT Technology Review Insights.

156 Kissinger E.A., Schmidt, E. and Huttenlocher D. (2021). *The age of AI: and of our human future*, Little, Brown and Company, New York, Boston, London.

as they are dynamically learning-specific as well.[157] Possibly, the entire concept of intelligence might be philosophically and etymologically expanded to embrace these novel artificial ways of creating AI-based knowledge. However, this intellectual stretch could not apply to the notion of moral responsibility, as this stems from human faculties and prerogatives which cannot be delegated to nor vindicated by machines. Future policy actions should be reflecting on these considerations, addressing the need for setting up a wide and purposeful communication, as well as societal dialogue and engagement on AI, dedicated to discussing its aim, means and impacts at large.

Summarizing, AI is showed as the novel, ubiquitous and pervasive frontier in science, research, technological innovation, industry, society, politics, and culture at large, both in EU and beyond. Due to its overwhelming current and prospective potentialities, this book demonstrates to what extent AI should responsibly empower humans, although it should neither substitute nor enhance them. This is the sole moral, ethical and sustainable way for benefitting from the enormous promises AI is outlining for advancing in prosperity empowered by responsible AI-powered knowledge creation and management.

Again, as always in science, research, and innovation, quoting Immanuel Kant's archetypical paradigm is particularly revealing, edifying, and inspiring: "the starry heavens above me and the moral law within me".[158]

[157] *Ibidem*
[158] Kant, I. 1788, *Kritik der praktischen Vernunft*, i.e., Critique of practical reason, Gutenberg book, https://gutenberg.org/ebooks/5683

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ANNEXES I to V

ANNEX I:
SUCCESSFUL AI-ENABLED PROJECTS ON
INDUSTRIAL TECHNOLOGIES AND MANUFACTURE

ANNEX II:
SUCCESSFUL AI-ENABLED PROJECTS ON
AUGMENTED MEDICINE AND HEALTHCARE

ANNEX III:
SUCCESSFUL AI-ENABLED PROJECTS ON
SUSTAINABLE ENVIRONMENT AND ENERGY

ANNEX IV:
SUCCESSFUL AI-ENABLED PROJECTS ON
ICT, MOBILITY AND SECURITY

ANNEX V:
SUCCESSFUL AI-ENABLED PROJECTS ON
ETHICAL, LEGAL AND SOCIAL DISCIPLINES

Note:
Over one hundred thousand AI-related entries have been initially sorted out from diverse EC databases (e.g., CORDIS), by extracting the most important AI quotations from signed or closed EC projects funded under all schemes over the last twenty years, e.g., titles, abstracts, narratives, reports, deliverables, publishable summaries. This step allowed the identification of a set of 650 successful AI-powered projects, mined thru and across all EC funding schemes by using specific data mining tools (e.g., CORTEX and Qlik). So, each cluster has been populated with a certain bulk of projects, displayed in Annexes I to V. The discriminants which enabled this selection are the AI quotations in projects titles, abstracts, narratives, reports, deliverables, publishable summaries, as well as those spotted in key projects outcomes, i.e., (i) publications; (ii) IPR and patents; (iii) protocols – e.g., production, application, clinical; (iv) and prototypes. Each cluster has been populated with a certain bulk of projects, displayed herein, i.e.,

(i) 51 projects in AI-enabled Industrial Technologies and Manufacture.
(ii) 221 projects in AI-enabled Augmented Medicine and Healthcare, more in detail, its main branches have been addressed: Diagnostics, Theragnostics, Targeted Drug-Delivery and Regenerative Medicine.
(iii) 83 projects in AI-enabled Sustainable Environment and Energy.
(iv) 205 projects in AI-enabled ICT, Mobility and Security.
(v) 90 projects in AI-enabled Ethical, Legal and Social disciplines.

ANNEX I:
SUCCESSFUL AI-ENABLED PROJECTS ON INDUSTRIAL TECHNOLOGIES & MANUFACTURE

Final Report Summary - ECOSHOPPING (Energy efficient & Cost competitive retrofitting solutions for Shopping buildings)
Commercial buildings show high energy saving potential by the refurbishment of envelope and applying easy-to-install and cost-effective building services solutions. Completed with an improved operation and maintenance, the EcoShopping brings affordable solution to the market...
Project: ECOSHOPPING (ID: 609180)

FIRST virtual Factories: Interoperation suppoRting buSiness innovaTion
ID: 734599
From: 1 January 2017 to: 31 December 2022
The manufacturing industry is entering a new era in which new ICT technologies and collaboration applications are integrated with traditional manufacturing practices and processes, which brings virtual organisations to factories, i.e. Manufacturing 2.0. Virtual factory to...
Coordinated in: United Kingdom
Programme: EXCELLENT SCIENCE - Marie Skłodowska-Curie Actions, Stimulating innovation by means of cross-fertilisation of knowledge
Last update: 1 February 2024

QU4LITY Digital Reality in Zero Defect Manufacturing
ID: 825030
From: 1 January 2019 to: 31 July 2022
QU4LITY will demonstrate, in a realistic, measurable, and replicable way an open, certifiable and highly standardised, SME-friendly and transformative shared data-driven ZDM product and service model for Factory 4.0 through 5 strategic ZDM plug & control lighthouse equipment...
Coordinated in: Spain
Programme: INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies - Information and Communication Technologies (ICT)
Last update: 11 December 2023

PROJECT

XMANAI Explainable Manufacturing Artificial Intelligence
ID: 957362
From: 1 November 2020 to: 30 April 2024
"Despite the indisputable benefits of AI, humans typically have little visibility and knowledge on how AI systems make any decisions or predictions due to the so-called “black-box effect” in which many of the machine learning/deep learning algorithms are not able to be...
Coordinated in: Italy
Programme: INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies - Information and Communication Technologies (ICT)
Last update: 4 December 2023

REPORT SUMMARY

PROJECT

SHAREWORK Safe and effective HumAn-Robot coopEration toWards a better cOmpetiveness on cuRrent automation lacK manufacturing processes.
ID: 820807
From: 1 November 2018 to: 31 October 2022
SHAREWORK‘s main objective is to endow an industrial work environment of the necessary “intelligence” and methods for the effective adoption of Human Robot Collaboration (HRC) with not fences, providing a system capable of understanding the environment and human actions...
Coordinated in: Spain
Programme: INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies - Advanced manufacturing and processing, Technologies for Factories of the Future
Last update: 16 July 2023

TheFSM The Food Safety Market: an SME-powered industrial data platform to boost the competitiveness of European food certification
ID: 871703
From: 1 February 2020 to: 31 January 2023
The Food Safety Market (TheFSM) aims to deliver an industrial data platform that will significantly boost the way that food certification takes place in Europe. It brings together and builds upon existing innovations from innovative ICT SMEs to deliver a uniquely open and...
Coordinated in: Greece
Programme: INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies - Information and Communication Technologies (ICT)
Last update: 19 December 2023

REPORT SUMMARY
PROJECT
PROJECT

SERENA VerSatilE plug-and-play platform enabling remote pREdictive mainteNAnce
ID: 767561
From: 1 October 2017 to: 31 March 2021
The growing complexity of modern engineering systems and manufacturing processes is an obstacle to concept and implement Intelligent Manufacturing Systems (IMS) and keep these systems operating at high levels of reliability. Additionally, the number of sensors and the amount...
Coordinated in: Italy
Programme: INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies - Advanced manufacturing and processing, Technologies for Factories of the Future
Last update: 4 September 2022

REPORT SUMMARY
REPORT SUMMARY
REPORT SUMMARY

vf-OS Virtual Factory Open Operating System
ID: 723710
From: 1 October 2016 to: 31 October 2019
The primary outcomes of vf-OS are an:- Open Operating System (vf-OS) and Software Development Kit (OAK) for Factories of the Future that aims to be the reference system software for collaborative manufacturing and logistics processes including its associated resources and...
Coordinated in: United Kingdom
Programme: INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies - Information and Communication Technologies (ICT)
Last update: 18 August 2022

PROJECT
PROJECT
PROJECT

SHAREWORK Safe and effective HumAn-Robot coopEration toWards a better cOmpetiveness on cuRrent automation lacK manufacturing processes.
ID: 820807
From: 1 November 2018 to: 31 October 2022

SHAREWORK‘s main objective is to endow an industrial work environment of the necessary “intelligence” and methods for the effective adoption of Human Robot Collaboration (HRC) with not fences, providing a system capable of understanding the environment and human actions...
Coordinated in: Spain
Programme: INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies - Advanced manufacturing and processing, Technologies for Factories of the Future
Last update: 16 July 2023

REPORT SUMMARY
REPORT SUMMARY
PROJECT

XMANAI Explainable Manufacturing Artificial Intelligence
ID: 957362
From: 1 November 2020 to: 30 April 2024
"Despite the indisputable benefits of AI, humans typically have little visibility and knowledge on how AI systems make any decisions or predictions due to the so-called “black-box effect” in which many of the machine learning/deep learning algorithms are not able to be...
Coordinated in: Italy
Programme: INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies - Information and Communication Technologies (ICT)
Last update: 4 December 2023

Final Report Summary - PACE-NET PLUS (Pacific Europe Network for Science, Technology and Innovation)
PACE-Net Plus is a project funded by the European Commission to support the institutional bi-regional policy dialogue in STI between the Pacific region and the European Union; strengthen the bi-regional cooperation between research and innovation actors, especially in the...
Project: PACE-NET PLUS (ID: 609490)
Programme: Specific Programme "Capacities": International co-operation
Last update: 13 September 2017

REPORT SUMMARY

Final Report Summary - NANO3BIO (NanoBioEngineering of BioInspired BioPolymers)
Nano3Bio has been a huge challenge, exciting research, and a rewarding experience! We had a large international and interdisciplinary consortium of academic and industrial partners to cover all relevant aspects of the subject, to allow us to successfully and efficiently...
Project: NANO3BIO (ID: 613931)
Programme: Specific Programme "Cooperation": Food, Agriculture and Biotechnology
Last update: 23 March 2018

REPORT SUMMARY

vf-OS Virtual Factory Open Operating System
ID: 723710
From: 1 October 2016 to: 31 October 2019
The primary outcomes of vf-OS are an:- Open Operating System (vf-OS) and Software Development Kit (OAK) for Factories of the Future that aims to be the reference system software for collaborative manufacturing and logistics processes including its associated resources and...
Coordinated in: United Kingdom
Programme: INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies - Information and Communication Technologies (ICT)
Last update: 18 August 2022

REPORT SUMMARY

SERENA VerSatilE plug-and-play platform enabling remote pREdictive mainteNAnce
ID: 767561
From: 1 October 2017 to: 31 March 2021
The growing complexity of modern engineering systems and manufacturing processes is an obstacle to concept and implement Intelligent Manufacturing Systems (IMS) and keep these systems operating at high levels of reliability. Additionally, the number of sensors and the amount...
Coordinated in: Italy

Programme: INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies - Advanced manufacturing and processing, Technologies for Factories of the Future
Last update: 4 September 2022

PrismArch Virtual reality aided design blending cross-disciplinary aspects of architecture in a multi-simulation environment
ID: 952002
From: 1 November 2020 to: 31 January 2023
The recent past of the AEC industry is characterized by digital breakthroughs that have dramatically shaped the design process. The powerful programs that are currently available offer unlimited possibilities, allowing complex and creative designs to be modelled accurately...
Coordinated in: Greece
Programme: INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies - Information and Communication Technologies (ICT)
Last update: 27 December 2023

PROJECT

DREAM-ON Structural damage: robust, real-time, and data-driven adaptive modeling for online control
ID: 101002857
From: 1 June 2021 to: 31 May 2026
Diagnosing structural damage and predicting its evolution has been a perpetual engineering issue. It is nowadays the topic of intensive research works addressing online damage detection and control, and benefiting from experimental and numerical advances made during the last...
Coordinated in: France
Programme: EXCELLENT SCIENCE - European Research Council (ERC)
Last update: 21 April 2022

PROJECT

AIMS5.0 Artificial Intelligence in Manufacturing leading to Sustainability and Industry5.0
ID: 101112089
From: 1 May 2023 to: 30 April 2026
AIMS5.0, a collaborative Innovation Action aims at strengthening European digital sovereignty in comprehensively sustainable production, by adopting, extending and implementing AI-enabled hardware and software components and systems across the whole industrial value chain to...
Coordinated in: Germany
Programme: Digital, Industry and Space, Key Digital Technologies
Last update: 7 December 2023

THOMAS Mobile dual arm robotic workers with embedded cognition for hybrid and dynamically reconfigurable manufacturing systems
ID: 723616
From: 1 October 2016 to: 31 March 2021
The productivity of the serial production model is compromised by the need to perform changes in the production equipment that cannot support multiple operations in dynamic environments. Low cost labour is no longer an option for EU manufacturers due to the fast rise of wages...
Coordinated in: Greece
Programme: INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies - Advanced manufacturing and processing, Technologies for Factories of the Future
Last update: 23 August 2022

PROJECT

SOCRATES SOcial Cognitive Robotics in The European Society
ID: 721619
From: 1 November 2016 to: 31 October 2020
SOCRATES is a PhD training program for 15 young researchers, created to develop the field of Social Robotics with an application focus on Robotics in Eldercare. The research in Social Robotics has a common theme of Interaction Quality, which is a concept for characterization...
Coordinated in: Sweden

Programme: EXCELLENT SCIENCE - Marie Skłodowska-Curie Actions, Fostering new skills by means of excellent initial training of researchers
Last update: 5 April 2023

PROJECT

NOMAD CoE Novel Materials Discovery
ID: 951786
From: 1 October 2020 to: 31 March 2024
Predicting novel materials with specific desirable properties is a major aim of ab initio computational materials science (aiCMS) and an urgent requirement of basic and applied materials science, engineering and industry. Such materials can have immense impact on the...
Coordinated in: Germany
Programme: Development, deployment and operation of ICT-based e-infrastructures, EXCELLENT SCIENCE - Research Infrastructures
Last update: 22 January 2024

PROJECT

REMODEL Robotic tEchnologies for the Manipulation of cOmplex DeformablE Linear objects
ID: 870133
From: 1 November 2019 to: 31 October 2023
REMODEL will enable new production environments, where the manufacturing of complex products composed of multiple wires and cables by means of dual-arm robots is not only possible, but fully integrated with the product design chain. This result will be achieved by exploiting...
Coordinated in: Italy
Programme: INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies - Advanced manufacturing and processing, Technologies for Factories of the Future
Last update: 18 December 2023

PROJECT

SWAG SOFT WEARABLE ASSISTIVE GARMENTS FOR HUMAN EMPOWERMENT
ID: 101120408
From: 1 November 2023 to: 31 October 2027
"Soft robotics has become one of the fastest growing fields over the last decade, and the development of technologies related to the associated modelling, sensing, actuation and control challenges has flourished as part of the field’s impetus. Soft robots have been...
Coordinated in: Greece
Programme: Digital, Industry and Space, Artificial Intelligence and Robotics
Last update: 30 June 2023

PROJECT

TRANSACT Transform safety-critical cyber-physical systems into distributed solutions for end-users and partners
ID: 101007260
From: 1 June 2021 to: 31 May 2024
"Market trends show advanced usage of safety-critical systems with novel services based on smart data analytics. Customers require continuous updates to applications and services and seek lower cost (Bill-of-Material, BoM) and easy to install solutions (maintenance) for...
Coordinated in: Netherlands
Programme: ECSEL, INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies - Information and Communication Technologies (ICT)
Last update: 2 January 2024

PROJECT

PULSATE Fostering the PAN-European infrastructure for empowering SMEs digital competences in laser-based advance and additive manufacturing.
ID: 951998
From: 1 September 2020 to: 31 August 2024
Digitizing European industry is essential for European competitivity in the 21st century, but only 1/5 of EU SMEs is highly digitised. Laser Based Advanced and Additive Manufacturing (LBAAM) technologies are regarded as Key Enablers for Digital Production and offer important...
Coordinated in: Spain

Programme: INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies - Information and Communication Technologies (ICT)
Last update: 24 January 2024

PROJECT

OPEN_NEXT Company-Community Collaboration for Open Source Development of products and services
ID: 869984
From: 1 September 2019 to: 30 November 2022
OPEN!NEXT enables SMEs to engage in company-community collaboration (C3) for means of co-development and market exploitation of Open Source Hardware (OSH) products and related services. OSH is an increasingly viable approach to intellectual property management extending the...
Coordinated in: Germany
Programme: INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies - Advanced manufacturing and processing, Technologies for Factories of the Future
Last update: 23 July 2023

PROJECT

euROBIN European ROBotics and AI Network
ID: 101070596
From: 1 July 2022 to: 30 June 2026
As robots are entering unstructured environments with a large variety of tasks, they will need to quickly acquire new abilities to solve them. Humans do so very effectively through a variety of methods of knowledge transfer – demonstration, verbal explanation, writing, the...
Coordinated in: Germany
Programme: Digital, Industry and Space, Artificial Intelligence and Robotics
Last update: 4 September 2022

PROJECT

Z-Fact0r Zero-defect manufacturing strategies towards on-line production management for European factories
ID: 723906
From: 1 October 2016 to: 31 March 2020
Manufacturing represents approximately 21 % of the EU's GDP and 20 % of its employment, providing more than 30 million jobs in 230 000 enterprises, mostly SMEs. Moreover, each job in industry is considered to be linked to two more in related services. European manufacturing...
Coordinated in: Greece
Programme: INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies - Advanced manufacturing and processing, Technologies for Factories of the Future
Last update: 18 August 2022

PROJECT

L2D2 Laser digital transfer of 2D materials enabled photonics: from the lab 2 the fab
ID: 101058079
From: 1 October 2022 to: 30 September 2025
To unveil the true potential of graphene and 2D materials and address the increasing demand for industrial applications, it is essential to develop upscaling growth technologies which preserve the pristine quality at large wafer size and enable the wafer-scale integration of...
Coordinated in: Greece
Programme: The European Innovation Council (EIC)
Last update: 4 September 2022

PROJECT

EUROBENCH EUropean ROBotic framework for bipedal locomotion bENCHmarking
ID: 779963
From: 1 January 2018 to: 30 June 2022
The EUROBENCH project aims at creating the first benchmarking framework for robotic systems in Europe. The framework will allow companies and researchers to test the performance of robots at any stage of development. The project will primarily focus on bipedal machines, i.e...
Coordinated in: Spain
Programme: INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies - Information and Communication Technologies (ICT)
Last update: 29 April 2023

XR5.0 Human-Centric AI-Enabled Extended Reality Applications for the Industry 5.0 Era
ID: 101135209
From: 1 January 2024 to: 31 December 2026
XR5.0 will build, demonstrate, and validate a novel Person-Centric and AI-based XR paradigm that will be tailored to the requirements and nature of I5.0 applications. In this direction, the project will specify structuring principles and blueprints for using XR in I5.0...
Coordinated in: Italy
Programme: Digital, Industry and Space, Emerging enabling technologies
Last update: 3 November 2023

DEFACTO Battery DEsign and manuFACTuring Optimization through multiphysic modelling
ID: 875247
From: 1 January 2020 to: 31 December 2023
The DEFACTO project rationale is to develop a multiphysic and multiscale modelling integrated tool to better understand the material, cell and manufacturing process behaviour, therefore allowing to accelerate cell development and the R&I process. This approach will allow...
Coordinated in: Spain
Programme: SOCIETAL CHALLENGES - Smart, Green And Integrated Transport
Last update: 22 January 2024

EXCELLERAT The European Centre of Excellence for Engineering Applications
ID: 823691
From: 1 December 2018 to: 31 May 2022
"Engineering applications will be among the first exploiting exascale, not only in academia but also industry. In fact, the industrial engineering field is *the* industrial field with the highest exascale potential, thus EXCELLERAT brings together the necessary European...
Coordinated in: Germany
Programme: Development, deployment and operation of ICT-based e-infrastructures, EXCELLENT SCIENCE - Research Infrastructures
Last update: 12 September 2023

PROJECT
BIM2TWIN BIM2TWIN: Optimal Construction Management & Production Control
ID: 958398
From: 1 November 2020 to: 30 April 2024
BIM2TWIN aims to build a Digital Building Twin (DBT) platform for construction management that implements lean principles to reduce operational waste of all kinds, shortening schedules, reducing costs, enhancing quality and safety and reducing carbon footprint. BIM2TWIN...
Coordinated in: France
Programme: Technologies enabling energy-efficient systems and energy-efficient buildings with a low environmental impact, INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies - Advanced manufacturing and processing
Last update: 28 December 2023

PERKS Eliciting and Exploiting Procedural Knowledge in Industry 5.0
ID: 101120323
From: 1 October 2023 to: 30 September 2026
Procedural Knowledge (PK) is knowing-how to perform some tasks. For industry workers, PK is the knowledge required to carry out a specific job, like correctly executing the safety procedure during maintenance interventions, or configuring an industrial system by following the...
Coordinated in: Italy
Programme: Digital, Industry and Space, Artificial Intelligence and Robotics
Last update: 14 July 2023

Better Factory Grow your manufacturing business
ID: 951813
From: 1 October 2020 to: 30 September 2024

Better Factory will provide methodology for Manufacturing SMEs to collaborate with Artists to develop new and personalized products. At the same time Better Factory will provide technology for SMEs to become fully connected cyber-physical-systems, transforming them into...
Coordinated in: Finland
Programme: INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies - Information and Communication Technologies (ICT)
Last update: 30 January 2024

CoRob-X Cooperative Robots for Extreme Environments
ID: 101004130
From: 1 March 2021 to: 28 February 2023
CoRob-X develops and demonstrates enabling technologies for multi-agent robotic teams. The primary target application is the exploration of planetary surfaces, with a focus on hard-to-reach areas. CoRob-X builds on robotic hardware provided by the project consortium and...
Coordinated in: Germany
Programme: Enabling European competitiveness, non-dependence and innovation of the European space sector, Enabling advances in space technology, INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies – Space
Last update: 27 December 2023

PROFIT Process Plant Reliable Operations Facilitated and Enhanced by Information Technology
ID: 5352
From: 2 January 1991 to: 1 July 1993
The objective of this project is to develop an integrated framework for the plant-wide management of industries, such as chemical and oil, which use complex interlinked processes. The project combines control theory algorithmic techniques and Artificial Intelligence concepts.
Coordinated in: Greece
Programme: European strategic programme (EEC) for research and development in information technologies (ESPRIT), 1987-1992
Last update: 17 June 1994

PROJECT

DIACAT Diamond materials for the photocatalytic conversion of CO2 to fine chemicals and fuels using visible light
ID: 665085
From: 1 July 2015 to: 31 December 2019
In DIACAT we propose the development of a completely new technology for the direct photocatalytic conversion of CO2 into fine chemicals and fuels using visible light. The approach utilises the unique property of man-made diamond, now widely available at low economic cost, to...
Coordinated in: Germany
Programme: EXCELLENT SCIENCE - Future and Emerging Technologies (FET), FET Open
Last update: 27 June 2023

RADIATE Research And Development with Ion Beams – Advancing Technology in Europe
ID: 824096
From: 1 January 2019 to: 30 June 2023
Fifteen partners from public research and four industrial partners, sharing the vision of structuring the ERA in the field of ion technology application and innovation, join forces in the RADIATE project. Largely com-plementary national ion beam facilities will be integrated...
Coordinated in: Germany
Programme: Integrating and opening existing national and regional research infrastructures of European interest, EXCELLENT SCIENCE - Research Infrastructures
Last update: 1 February 2024

SME 5.0 A Strategic Roadmap Towards the Next Level of Intelligent, Sustainable and Human-Centred SMEs
ID: 101086487
From: 1 January 2023 to: 31 December 2026

Over the last ten years many efforts have been made to transfer Industry 4.0 from research to practice. Recently, great progress has been made to introduce also SMEs to the use of Industry 4.0. The next big challenge for SMEs will be to implement the dual (or twin)...
Coordinated in: Italy
Programme: Marie Skłodowska-Curie Actions (MSCA)
Last update: 21 October 2022

PROJECT

SISHOT Single-shot, ultrashort laser pulse characterization based on the dispersion scan technique
ID: 101058075
From: 1 September 2022 to: 31 August 2025
Ultrashort laser pulses are prominent enabling tools in countless advanced applications, ranging from fundamental research to medical and industrial use. However, straightforward characterization of ultrashort laser pulses remains a nontrivial task. The proposed project...
Coordinated in: Sweden
Programme: The European Innovation Council (EIC)
Last update: 28 July 2022

CLARUS Optimizing Production and Logistic Resources in the Time-critical Bio Production Industries in Europe
ID: 101070076
From: 1 September 2022 to: 31 August 2025
The CLARUS project aims to connect the Sustainable Paradigm in the food industry and AI-based applications, with the goal of developing a platform with high communications and processing capabilities, as well as the use of standardized open protocols and data models that will...
Coordinated in: Italy
Programme: Digital, Industry and Space, Artificial Intelligence and Robotics
Last update: 5 August 2022

CIRC4Life A circular economy approach for lifecycles of products and services
ID: 776503
From: 1 May 2018 to: 31 October 2021
This project aims to develop and implement a circular economy approach for sustainable products and services through their value and supply chains. Three new circular economy business models will be developed including (i) co-creation of products and services, (ii) sustainable...
Coordinated in: United Kingdom
Programme: SOCIETAL CHALLENGES - Climate action, Environment, Resource Efficiency and Raw Materials, Enabling the transition towards a green economy and society through eco-innovation
Last update: 5 April 2023

ScalABLE4.0 Scalable automation for flexible production systems
ID: 723658
From: 1 January 2017 to: 30 June 2020
The main objective of the ScalABLE 4.0 project is the development and demonstration of an open scalable production system framework (OSPS) that can be used efficiently and effectively to visualize, virtualize, construct, control, maintain and optimize production lines. The...
Coordinated in: Portugal
Programme: INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies - Information and Communication Technologies (ICT)
Last update: 4 September 2022

PROJECT

MANUELA Additive Manufacturing using Metal Pilot Line
ID: 820774
From: 1 October 2018 to: 31 March 2023
Metal additive manufacturing (AM) allows, by enabling use of advanced design, production of high added value components, at levels that cannot be reached with conventional manufacturing technique. Still, the AM-based manufacturing sequence implies large amounts of critical...
Coordinated in: Sweden

Programme: INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies - Advanced manufacturing and processing, Technologies for Factories of the Future
Last update: 1 February 2024

PROJECT

Electro-Intrusion Simultaneous transformation of ambient heat and undesired vibrations into electricity via nanotriboelectrification during non-wetting liquid intrusion-extrusion into-from nanopores
ID: 101017858
From: 1 January 2021 to: 31 December 2025
Greenhouse gas emissions, pollution and rational energy use are civilization-scale challenges which need to be resolved urgently, in particular by the conversion of abundant waste heat and undesired vibrations into useful electricity. However, the low efficiency of existing...
Coordinated in: Spain
Programme: EXCELLENT SCIENCE - Future and Emerging Technologies (FET), FET Proactive
Last update: 28 December 2023

DIGICOR Decentralised Agile Coordination Across Supply Chains
ID: 723336
From: 1 October 2016 to: 30 September 2019
European manufacturing competes in a global knowledge-driven economy, and thus increasingly seeks competitive advantage through quality, agility and personalisation based on latest advances in IT. Increasing utilisation of IT in mission-critical elements of the production...
Coordinated in: Germany
Programme: INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies - Information and Communication Technologies (ICT)
Last update: 17 August 2022

PAM^2 Precision Additive Metal Manufacturing
ID: 721383
From: 1 December 2016 to: 30 November 2020
Additive Manufacturing (AM) is a fast−growing sector with the ability to evoke a revolution in manufacturing due to its almost unlimited design freedom and its capability to produce personalised parts locally and with efficient material use. AM companies however still face...
Coordinated in: Belgium
Programme: EXCELLENT SCIENCE - Marie Skłodowska-Curie Actions, Fostering new skills by means of excellent initial training of researchers
Last update: 2 August 2021

PROJECT

TRINITY Digital Technologies, Advanced Robotics and increased Cyber-security for Agile Production in Future European Manufacturing Ecosystems
ID: 825196
From: 1 January 2019 to: 30 June 2023
The main objective of TRINITY is to create a network of multidisciplinary and synergistic local digital innovation hubs (DIHs) composed of research centers, companies, and university groups that cover a wide range of topics that can contribute to agile production: advanced...
Coordinated in: Finland
Programme: INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies - Information and Communication Technologies (ICT)
Last update: 11 December 2023

FF4EuroHPC FF4EUROHPC: HPC INNOVATION FOR EUROPEAN SMES
ID: 951745
From: 1 September 2020 to: 31 October 2023
The FF4EuroHPC proposal addresses the need for outreach to, and support of, Europe’s Small and Medium-sized Enterprises (SMEs) in order that they can profit from the innovation advantages offered by advanced High Performance Computing (HPC) technologies and services...

Coordinated in: Germany
Programme: INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies - Information and Communication Technologies (ICT), Next generation computing: Advanced and secure computing systems and technologies, including cloud computing
Last update: 27 December 2023

PROJECT

ANNEX II:
SUCCESSFUL AI-ENABLED PROJECTS ON AUGMENTED MEDICINE AND HEALTHCARE

HosmartAI Hospital Smart development based on AI
ID: 101016834
From: 1 January 2021 to: 31 May 2024
"HosmartAI will create a common open Integration Platform with the necessary tools to facilitate and measure the benefits of integrating digital technologies (robotics and AI) in the healthcare system. A central hub will offer multi-faceted lasting functionalities...
Coordinated in: Belgium
Programme: INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies - Information and Communication Technologies (ICT)
Last update: 28 December 2023

PROJECT

BRAINTEASER BRinging Artificial INTelligencE home for a better cAre of amyotrophic lateral sclerosis and multiple SclERosis
ID: 101017598
From: 1 January 2021 to: 31 December 2024
Amyotrophic Lateral Sclerosis (ALS) and Multiple Sclerosis (MS) are chronic diseases characterized by progressive or alternate impairment of neurological functions (motor, sensory, visual, cognitive). Patients have to manage alternated periods in hospital with care at home...
Coordinated in: Spain
Programme: SOCIETAL CHALLENGES - Health, demographic change and well-being, Individual awareness and empowerment for self-management of health
Last update: 5 February 2024

PROJECT

HosmartAI Hospital Smart development based on AI
ID: 101016834
From: 1 January 2021 to: 31 May 2024
"HosmartAI will create a common open Integration Platform with the necessary tools to facilitate and measure the benefits of integrating digital technologies (robotics and AI) in the healthcare system. A central hub will offer multi-faceted lasting functionalities...
Coordinated in: Belgium
Programme: INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies - Information and Communication Technologies (ICT)
Last update: 28 December 2023

PROJECT DESCRIPTION

PROJECT

BD4QoL Big Data Models and Intelligent tools for Quality of Life monitoring and participatory empowerment of head and neck cancer survivors
ID: 875192
From: 1 January 2020 to: 31 December 2024
Head and neck cancer can take away a patient's "right to feel human," and its impact on physical appearance, physical functioning, psychological status and general quality of life (QoL) can be devastating. Over the past several decades, the number of patients who survive...
Coordinated in: Italy
Programme: SOCIETAL CHALLENGES - Health, demographic change and well-being, Improving halth information and better use of health data, Transferring knowledge to clinical practice and scalable innovation actions

Last update: 19 December 2023

WARIFA Watching the risk factors: Artificial intelligence and the prevention of chronic conditions
ID: 101017385
From: 1 January 2021 to: 31 December 2024
Digital healthcare may prevent poor health. Personalised early risk prediction by artificial intelligence can empower citizens to adopt healthier habits and a better lifestyle. This project aims at defining a general personalised early risk prediction model that will be used...
Coordinated in: Norway
Programme: SOCIETAL CHALLENGES - Health, demographic change and well-being, Individual awareness and empowerment for self-management of health
Last update: 28 December 2023

ONCORELIEF A digital guardian angel enhancing cancer patient's wellbeing and health status improvement following treatment.
ID: 875392
From: 1 January 2020 to: 30 June 2023
The burden of cancer is rising globally and is estimated to have reached 18.1 million new cases and 9.6 million cancer deaths in 2018. Despite the rising cancer incidence, improvements in early detection and therapeutic treatment have improved cancer survival. As a...
Coordinated in: United Kingdom
Programme: SOCIETAL CHALLENGES - Health, demographic change and well-being, Improving halth information and better use of health data, Transferring knowledge to clinical practice and scalable innovation actions
Last update: 29 January 2024

PROJECT

CONNECARE Personalised Connected Care for Complex Chronic Patients
ID: 689802
From: 1 April 2016 to: 31 December 2019
The ambition of the CONNECARE consortium is to co-design, develop, deploy, and evaluate a novel smart, adaptive integrated care system for chronic care management. This will save European healthcare organisations huge sums whilst improving patient outcomes. The consortium...
Coordinated in: Spain
Programme: SOCIETAL CHALLENGES - Health, demographic change and well-being, Health care provision and integrated care
Last update: 10 February 2023

PROJECT

ENVISION Intelligent plug-and-play digital tool for real-time surveillance of COVID-19 patients and smart decision-making in Intensive Care Units
ID: 101015930
From: 1 December 2020 to: 31 July 2023
Within only six months, over 7.4 million people have been diagnosed with SARS-CoV-2. In the most severely hit countries, more than 10% of infected patients have received treatment in Intensive Care Units (ICUs). Insufficient data and limited knowledge on the disease as well as...
Coordinated in: Germany
Programme: SOCIETAL CHALLENGES - Health, demographic change and well-being
Last update: 27 December 2023

PROJECT

PROJECT

HumanE-AI-Net HumanE AI Network
ID: 952026
From: 1 September 2020 to: 31 August 2024
The HumanE AI Net brings together top European research centers, universities and key industrial champions into a network of centers of excellence that goes beyond a narrow definition of AI and combines world leading AI competence with key players in related areas such as...
Coordinated in: Germany

Programme: INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies - Information and Communication Technologies (ICT)
Last update: 24 January 2024

PROJECT

ASCAPE Artificial intelligence Supporting CAncer Patients across Europe
ID: 875351
From: 1 January 2020 to: 30 June 2023
The latest cancer statistics highlight encouraging advances in decreasing cancer-related mortality. However, given that one in two people will be diagnosed with cancer in their lifetime, and due to the growing and ageing population, the absolute number of people living with...
Coordinated in: Greece
Programme: SOCIETAL CHALLENGES - Health, demographic change and well-being, Improving halth information and better use of health data, Transferring knowledge to clinical practice and scalable innovation actions
Last update: 19 September 2023

PROJECT

HBP SGA2 Human Brain Project Specific Grant Agreement 2
ID: 785907
From: 1 April 2018 to: 31 March 2020
The Human Brain Project (HBP) is a major European scientific research initiative to improve our understanding of the brain and the role it plays in making us human, and to exploit the opportunities offered by the resulting knowledge. The size and complexity of the brain make...
Coordinated in: Switzerland
Programme: EXCELLENT SCIENCE - Future and Emerging Technologies (FET), FET Flagships
Last update: 23 November 2023

PROJECT

COUCH Council of Coaches
ID: 769553
From: 1 September 2017 to: 31 August 2020
Despite the proliferation of ICT solutions for personalized healthcare, there is still no easy way to provide older adults with integrated coaching services. Council of Coaches (COUCH) introduces a radically new virtual coaching concept based on multiple autonomous, embodied...
Coordinated in: Netherlands
Programme: SOCIETAL CHALLENGES - Health, demographic change and well-being, Active ageing and self-management of health
Last update: 25 August 2022

PROJECT

CINDERELLA Clinical Validation of an AI-based approach to improve the shared decision-making process and outcomes in Breast Cancer Patients proposed for Locoregional treatment
ID: 101057389
From: 1 June 2022 to: 31 May 2026
Breast cancer is the most commonly diagnosed cancer, with an estimated 2.3 million new cases per year globally. Approximately 90% of these patients will undergo breast surgery with/without radiation (locoregional treatment). Different surgical techniques can be offered to the...
Coordinated in: Portugal
Programme: Health, Tools, Technologies and Digital Solutions for Health and Care, including personalised medicine
Last update: 4 September 2022

PROJECT

BESAFE ARTIFICIAL INTELLIGENCE ENHANCEMENT OF SURGICAL TECHNOLOGY FOR THE REDUCTION OF HUMAN BEHAVIOUR-RELATED SURGICAL ACCIDENTS
ID: 847378
From: 1 May 2019 to: 30 April 2020
BESAFE seeks to support the exploitation of the results from the IBSEN FET project and capture a market opportunity as well as address a poignant societal need, the reduction of intra-operative accidents and surgery costs by means of clinical decision support software.IBSEN...

Coordinated in: Spain
Programme: EXCELLENT SCIENCE - Future and Emerging Technologies (FET), FET Open
Last update: 17 August 2022

PROJECT

TOLIFE Combining Artificial Intelligence and smart sensing TOward better management and improved quality of LIFE in chronic obstructive pulmonary disease
ID: 101057103
From: 1 September 2022 to: 28 February 2027
Chronic obstructive pulmonary disease (COPD) is a highly prevalent chronic condition. While COPD is a lung disease, it is mainly the exacerbations and extrapulmonary comorbidities which affect the quality of life, health care costs, and prognosis. The optimal COPD treatment...
Coordinated in: Italy
Programme: Health, Tools, Technologies and Digital Solutions for Health and Care, including personalised medicine
Last update: 28 July 2022

PROJECT

CHAIMELEON Accelerating the lab to market transition of AI tools for cancer management
ID: 952172
From: 1 September 2020 to: 28 February 2025
CHAIMELEON aims to set up a structured repository for health imaging data to be openly reused in AI experimentation for cancer management. An EU-wide repository will be built as a distributed infrastructure in full compliance with legal and ethics regulations in the involved...
Coordinated in: Spain
Programme: SOCIETAL CHALLENGES - Health, demographic change and well-being, Methods and data
Last update: 5 February 2024

PROJECT DESCRIPTION
RESULTS IN BRIEF

AI tools could offer cancer patients more personalised aftercare
Effectively profiling risks to cancer patients during aftercare, would boost quality of life and survival rates. CLARIFY's artificial intelligence-driven digital tools help clinicians deliver more tailored treatment.
Project: CLARIFY (ID: 875160)
Available languages:
DEENESFRITPL
Last update: 15 December 2023

PROJECT
REPORT SUMMARY

Final Report Summary - NUDGE-IT (The Neurobiology of Decision-Making in Eating - Innovative Tools)
Nudge-it was a multidisciplinary, multinational project funded by the European Union FP7 programme to address the need for a better understanding of the determinants of food choice. The project engaged experts in the neurobiology of motivational behaviour, the neuroscience of...
Project: NUDGE-IT (ID: 607310)
Programme: Specific Programme "Cooperation": Food, Agriculture and Biotechnology
Last update: 2 October 2020

PROJECT

HTx Next Generation Health Technology Assessment to support patient-centred, societally oriented, real-time decision-making on access and reimbursement for health technologies throughout Europe
ID: 825162
From: 1 January 2019 to: 30 June 2024
HTx will create a framework for next generation Health Technology Assessment (HTA) that supports patient-centred, societally oriented, and real-time decision-making for integrated healthcare throughout Europe. HTx will focus on therapeutic areas with high unmet need for which...
Coordinated in: Netherlands
Programme: SOCIETAL CHALLENGES - Health, demographic change and well-being, Health care provision and integrated care
Last update: 2 February 2024

PROJECT

HBP SGA1 Human Brain Project Specific Grant Agreement 1
ID: 720270
From: 1 April 2016 to: 31 March 2018
Understanding the human brain is one of the greatest scientific challenges of our time. Such an understanding can provide profound insights into our humanity, leading to fundamentally new computing technologies, and transforming the diagnosis and treatment of brain disorders...
Coordinated in: Switzerland
Programme: EXCELLENT SCIENCE - Future and Emerging Technologies (FET)
Last update: 28 February 2023

REPORT SUMMARY

Periodic Reporting for period 2 - PERSIST (Patients-centered SurvivorShIp care plan after Cancer treatments based on Big Data and Artificial Intelligence technologies)
Cancer concerns all European citizens. 40% of us are likely to be affected and we all know someone who developed the disease. In 2020, 19.3 million of new cases appeared and there were 9.96 million deaths For a long time, cancer treatment has been the main focus of research...
Project: PERSIST (ID: 875406)
Programme: SOCIETAL CHALLENGES - Health, demographic change and well-being
Last update: 3 June 2022

PROJECT

FrailSafe Sensing and predictive treatment of frailty and associated co-morbidities using advanced personalized patient models and advanced interventions
ID: 690140
From: 1 January 2016 to: 30 April 2019
Ageing population is steeply increasing worldwide. A consequence of age related decline is the clinical condition of frailty. Frailty is a biological syndrome of decreased reserve and resistance to stressors, resulting from cumulative declines across multiple physiologic...
Coordinated in: Greece
Programme: SOCIETAL CHALLENGES - Health, demographic change and well-being, Active ageing and self-management of health
Last update: 8 September 2023

PROJECT

REACH2020 Responsive Engagement of the Elderly promoting Activity and Customized Healthcare
ID: 690425
From: 1 February 2016 to: 31 January 2020
The health expenditure in the EU is expected to rise by 350% by 2050 compared to an economic expansion of only 180% and the provision of Long Term Care (LTC) will pose an increasing challenge to the sustainability of public finances in the EU, due to an ageing population...
Coordinated in: Germany
Programme: SOCIETAL CHALLENGES - Health, demographic change and well-being, Active ageing and self-management of health
Last update: 17 August 2022

REPORT SUMMARY
PROJECT

Periodic Reporting for period 1 - BRAINTEASER (BRinging Artificial INTelligencE home for a better cAre of amyotrophic lateral sclerosis and multiple SclERosis)
BRAINTEASER is a 48 months project that started on January 1st 2021, co-funded by the European Union’s Horizon 2020 research (grant agreement No 101017598) under the domain of the Health, demographic change and well-being. The BRAINTEASER Project driven by 11 partners from 6...
Project: BRAINTEASER (ID: 101017598)
Programme: SOCIETAL CHALLENGES - Health, demographic change and well-being
Last update: 9 May 2022

INTERVENE International consortium for integrative genomics prediction
ID: 101016775
From: 1 January 2021 to: 31 December 2025
The aim of INTERVENE is to develop and test next generation tools for disease prevention, diagnosis, and personalised treatment utilizing the first US-European pool of genomic and health data and integrating longitudinal and disease-relevant -omics data into genetic risk...
Coordinated in: Finland
Programme: SOCIETAL CHALLENGES - Health, demographic change and well-being, Methods and data
Last update: 28 December 2023

AI4HEALTHSEC A Dynamic and Self-Organized Artificial Swarm Intelligence Solution for Security and Privacy Threats in Healthcare ICT Infrastructures
ID: 883273
From: 1 October 2020 to: 31 December 2023
The increasing interconnection of technology in healthcare between devices at the physical and cyber levels has transformed these infrastructures into large Health Care Information Infrastructures. Such HCIIs are considered critical and sensitive infrastructures due to their...
Coordinated in: Italy
Programme: Ensure privacy and freedom, including in the Internet and enhance the societal, legal and ethical understanding of all areas of security, risk and management, Improve cyber security, Secure societies - Protecting freedom and security of Europe and its citizens
Last update: 18 December 2023

PROJECT

FAITH a Federated Artificial Intelligence solution for moniToring mental Health status after cancer treatment
ID: 875358
From: 1 January 2020 to: 30 June 2024
The main aim of FAITH is to apply the latest Artificial Intelligence (AI) and Big Data analytics techniques to better model and predict disease/treatment trajectories of cancer patients, with the goal of improving their quality of life and aftercare. To protect privacy of the...
Coordinated in: Ireland
Programme: SOCIETAL CHALLENGES - Health, demographic change and well-being, Improving halth information and better use of health data, Transferring knowledge to clinical practice and scalable innovation actions
Last update: 5 February 2024

PROJECT

IM-TWIN from Intrinsic Motivations to Transitional Wearable INtelligent companions for autism spectrum disorder
ID: 952095
From: 1 November 2020 to: 31 October 2023
The IM-TWIN project aims to develop some of the outcomes of the FET GOAL-Robots project towards market exploitation. The basic-research FET GOAL-Robots project aimed to study how intrinsic motivations (“curiosity”) drive exploration and learning in children, and how such...
Coordinated in: Italy
Programme: EXCELLENT SCIENCE - Future and Emerging Technologies (FET), FET Proactive
Last update: 26 February 2023

REPORT SUMMARY
PROJECT

ORACLE Optimize risk prediction after myocardial infarction through artificial intelligence and multidimensional evaluation
ID: 101117469
From: 1 April 2024 to: 31 March 2029
Myocardial infarction (MI) is a leading cause of death worldwide. After MI, long-term antithrombotic therapy is crucial to prevent recurrent events, but increases bleeding, that also impacts morbidity and mortality. Giving these competing risks prediction tools to forecast...
Coordinated in: Spain

Programme: European Research Council (ERC)
Last update: 26 December 2023

PROJECT

WellCO Wellbeing and Health Virtual Coach
ID: 769765
From: 1 December 2017 to: 31 January 2021
WellCo delivers a radical new ICT-based solution in the provision of personalised advice, guidance and follow-up of users for the adoption of healthier behaviour choices that help them to maintain or improve their physical cognitive, mental and social well-being for as long as...
Coordinated in: Spain
Programme: SOCIETAL CHALLENGES - Health, demographic change and well-being, Active ageing and self-management of health
Last update: 22 August 2022

RADAR-CNS Remote Assessment of Disease and Relapse in Central Nervous System Disorders
ID: 115902
From: 1 April 2016 to: 31 March 2022
Background: Long term conditions require monitoring of patients, traditionally conducted in the clinic, to monitor treatment effects, adverse events and disease course. This can be inefficient and cumbersome – clinic visits may be too infrequent to identify individuals at...
Coordinated in: United Kingdom
Programme: SOCIETAL CHALLENGES - Health, demographic change and well-being, Innovative Medicines Initiative 2 (IMI2)
Last update: 2 February 2024

PROJECT

HeartMan Personal Decision Support System For Heart Failure Management
ID: 689660
From: 1 January 2016 to: 30 April 2019
1–2% of the developed world suffers from congestive heart failure (CHF), which is the most frequent cause of hospitalization in people aged over 65. CHF management involves medications, monitoring of fluid intake and weight, exercise and lifestyle modifications. Since most...
Coordinated in: Slovenia
Programme: SOCIETAL CHALLENGES - Health, demographic change and well-being, Active ageing and self-management of health
Last update: 15 August 2022

HBM4EU European Human Biomonitoring Initiative
ID: 733032
From: 1 January 2017 to: 30 June 2022
The overarching goal of the European Human Biomonitoring Initiative (HBM4EU) is to generate knowledge to inform the safe management of chemicals and so protect human health. We will use human biomonitoring to understand human exposure to chemicals and resulting health impacts...
Coordinated in: Germany
Programme: SOCIETAL CHALLENGES - Health, demographic change and well-being, Preventing disease
Last update: 8 December 2023

PROJECT

Periodic Reporting for period 1 - WARIFA (Watching the risk factors: Artificial intelligence and the prevention of chronic conditions)
The United Nations has specifically addressed the need for preventing noncommunicable diseases in their "2030 agenda for sustainable development". WHO defines noncommunicable diseases as Chronic Conditions (CCs) caused by a combination of genetic, physiological, environmental...
Project: WARIFA (ID: 101017385)
Programme: SOCIETAL CHALLENGES - Health, demographic change and well-being
Last update: 16 April 2023

PROJECT

Breast cancer: EU funding for new tools and solutions

Breast cancer claims the lives of more European women than any other cancer: one in eight women in the EU will develop breast cancer before the age of 85. Data from the European Cancer Information System (ECIS) indicate more than 400 000 new cases were diagnosed in 2018. By improving the quality of breast cancer services in Europe, the European Commission Initiative on Breast Cancer (ECIBC) aims to help reduce the burden of cancer and decrease the avoidable differences in breast cancer incidence, prevalence, mortality and survival.
Available languages:
DEENESFRITPL
Last update: 18 September 2019

PROJECT

AI4MED Interdisciplinary Centre for Artificial Intelligence in Medicine
ID: 101087535
From: 1 March 2023 to: 29 February 2028
The main aim of this project is to establish a new research center at the Jagiellonian University (JU) in Kraków (Poland). The center will conduct high quality interdisciplinary research connecting artificial intelligence (AI) with healthcare. This group will build on the...
Coordinated in: Poland
Programme: ERA-Chairs, Widening participation and spreading excellence
Last update: 10 March 2023

PROJECT

ARISTOTELES Applying ARtificial Intelligence to Define clinical trajectorieS for personalized predicTiOn and early deTEctiOn of comorbidiTy and muLtimorbidiTy pattErnS
ID: 101080189
From: 1 November 2023 to: 31 October 2028
The ARISTOTELES project aims to build a multinational harmonized data platform to develop and implement novel artificial intelligence (AI) approaches for management of complex diseases, where progression and manifestations of comorbidities are via multiple interacting...
Coordinated in: Italy
Programme: Health, Health throughout the Life Course
Last update: 1 November 2023

PROJECT
REPORT SUMMARY

Periodic Reporting for period 2 - CORESMA (COVID-19-Outbreak Response combining E-health, Serolomics, Modelling, Artificial Intelligence and Implementation Research)
The primary main objective of CORESMA is to generate the most needed clinical and epidemiological data required for defining targeted public health measures at national and global level to become effective during this pandemic.The secondary main objective is to develop and...
Project: CORESMA (ID: 101003480)
Programme: SOCIETAL CHALLENGES - Health, demographic change and well-being
Last update: 27 September 2022

REPORT SUMMARY

Final Report Summary - SMART-HIP (Sensor Based Detection of Implant Loosening in Total Hip Replacements)
Ageing, sedentary behavior, and obesity are predictors of osteoarthritis, a Non Communicable Disease which is the leading cause of disability in the developed world, affecting 9.6% of men and 18% of women aged over 60 years, and among the leading conditions causing work...
Project: SMART-HIP (ID: 606335)
Programme: Specific Programme "Capacities": Research for the benefit of SMEs
Last update: 26 November 2018

PROJECT

FrailSafe Sensing and predictive treatment of frailty and associated co-morbidities using advanced personalized patient models and advanced interventions
ID: 690140
From: 1 January 2016 to: 30 April 2019

Ageing population is steeply increasing worldwide. A consequence of age related decline is the clinical condition of frailty. Frailty is a biological syndrome of decreased reserve and resistance to stressors, resulting from cumulative declines across multiple physiologic...
Coordinated in: Greece
Programme: SOCIETAL CHALLENGES - Health, demographic change and well-being, Active ageing and self-management of health
Last update: 8 September 2023

REPORT SUMMARY

Periodic Reporting for period 2 - PERSIST (Patients-centered SurvivorShIp care plan after Cancer treatments based on Big Data and Artificial Intelligence technologies)
Cancer concerns all European citizens. 40% of us are likely to be affected and we all know someone who developed the disease. In 2020, 19.3 million of new cases appeared and there were 9.96 million deathsFor a long time, cancer treatment has been the main focus of research...
Project: PERSIST (ID: 875406)
Programme: SOCIETAL CHALLENGES - Health, demographic change and well-being
Last update: 3 June 2022

PROJECT

REPORT SUMMARY

Final Report Summary - EU CHIC (European Cultural Heritage Identity Card)
Executive Summary:The primary objective of the “European Cultural Heritage Identity Card” (EU-CHIC) project is to propose a strategy, and systems, for the most efficient methods and tools of harmonising criteria and indicators to track changes and interventions on the...
Project: EU CHIC (ID: 226995)
Programme: Specific Programme "Cooperation": Environment (including Climate Change)
Last update: 1 April 2015

PROJECT

REACH2020 Responsive Engagement of the Elderly promoting Activity and Customized Healthcare
ID: 690425
From: 1 February 2016 to: 31 January 2020
The health expenditure in the EU is expected to rise by 350% by 2050 compared to an economic expansion of only 180% and the provision of Long Term Care (LTC) will pose an increasing challenge to the sustainability of public finances in the EU, due to an ageing population...
Coordinated in: Germany
Programme: SOCIETAL CHALLENGES - Health, demographic change and well-being, Active ageing and self-management of health
Last update: 17 August 2022

REPORT SUMMARY

Final Report Summary - FOODINTEGRITY (Ensuring the Integrity of the European food chain)
FoodIntegrity is a 5 year, interdisciplinary project funded under Framework 7, that aimed to assure the integrity of our food. The project comprised 60 participants from EU Member States, China and Argentina. FoodIntegrity was commissioned in 2014 against the background of...
Project: FOODINTEGRITY (ID: 613688)
Programme: Specific Programme "Cooperation": Food, Agriculture and Biotechnology
Last update: 3 July 2019

PROJECT

EHDEN European Health Data and Evidence Network
ID: 806968
From: 1 November 2018 to: 31 October 2024
Europe is generating huge amounts of patient-level information contained in Electronic Health Record (EHR) systems and other types of health databases. These include structured data in the form of diagnoses, medications, laboratory test results, etc., and unstructured data in...
Coordinated in: Netherlands
Programme: SOCIETAL CHALLENGES - Health, demographic change and well-being, Innovative Medicines Initiative 2 (IMI2)
Last update: 1 February 2024

PROJECT

BigData Heart Big Data 4 Better Hearts - Sofia ref.: 116074
ID: 116074
From: 1 March 2017 to: 28 February 2023
Despite remarkable progress in the management of cardiovascular disease (CVD), major unmet needs remain with regard to mortality, hospitalisations, quality of life (QoL), healthcare expenditures and productivity. Acute coronary syndrome (ACS), atrial fibrillation (AF) and...
Coordinated in: Netherlands
Programme: SOCIETAL CHALLENGES - Health, demographic change and well-being, Innovative Medicines Initiative 2 (IMI2)
Last update: 1 February 2024

PROJECT

AFFECT-EU DIGITAL, RISK-BASED SCREENING FOR ATRIAL FIBRILLATION IN THE EUROPEAN COMMUNITY
ID: 847770
From: 1 January 2020 to: 31 March 2024
Atrial fibrillation (AF) is an increasingly common arrhythmia in the aging European population. Its prevalence will more than double by the year 2050 affecting 5% of EU women and men aged ≥65 years. AF carries a high risk of stroke, heart failure, and dementia, which result...
Coordinated in: Germany
Programme: SOCIETAL CHALLENGES - Health, demographic change and well-being, Preventing disease
Last update: 12 December 2023

PROJECT

AIDA Artificial Intelligence Data Analysis
ID: 776262
From: 1 September 2018 to: 28 February 2022
AIDA brings a transformational innovation to the analysis of heliophysics data in four steps. First, AIDA will develop a new open source software called AIDApp written in Python (a free language) and capable of collecting, combining and correlating data from different space...
Coordinated in: Belgium
Programme: INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies – Space, Enabling exploitation of space data
Last update: 23 December 2022

PROJECT

HBM4EU European Human Biomonitoring Initiative
ID: 733032
From: 1 January 2017 to: 30 June 2022
The overarching goal of the European Human Biomonitoring Initiative (HBM4EU) is to generate knowledge to inform the safe management of chemicals and so protect human health. We will use human biomonitoring to understand human exposure to chemicals and resulting health impacts...
Coordinated in: Germany
Programme: SOCIETAL CHALLENGES - Health, demographic change and well-being, Preventing disease
Last update: 8 December 2023

PROJECT
REPORT SUMMARY

Final Report Summary - HERITAGE PLUS (ERA-NET Plus on Cultural Heritage and Global Change Research)
Europe’s cultural heritage is the world’s most diverse and rich patrimony attracting millions of visitors every year to monuments, historical city centres, archaeological sites and museums. Moreover, heritage is an important component of individual and collective identity...
Project: HERITAGE PLUS (ID: 618104)
Programme: Specific Programme "Cooperation": Environment (including Climate Change)
Last update: 7 June 2019

REPORT SUMMARY

INTERVENE International consortium for integrative genomics prediction
ID: 101016775
From: 1 January 2021 to: 31 December 2025

The aim of INTERVENE is to develop and test next generation tools for disease prevention, diagnosis, and personalised treatment utilizing the first US-European pool of genomic and health data and integrating longitudinal and disease-relevant -omics data into genetic risk...
Coordinated in: Finland
Programme: SOCIETAL CHALLENGES - Health, demographic change and well-being, Methods and data
Last update: 28 December 2023

REPORT SUMMARY

Periodic Reporting for period 1 - BRAINTEASER (BRinging Artificial INTelligencE home for a better cAre of amyotrophic lateral sclerosis and multiple SclERosis)
BRAINTEASER is a 48 months project that started on January 1st 2021, co-funded by the European Union's Horizon 2020 research (grant agreement No 101017598) under the domain of the Health, demographic change and well-being. The BRAINTEASER Project driven by 11 partners from 6...
Project: BRAINTEASER (ID: 101017598)
Programme: SOCIETAL CHALLENGES - Health, demographic change and well-being
Last update: 9 May 2022

PROJECT

Final Report Summary - SODSAT (Remote precision management of turf grass sod production by means of artificial intelligence and satellite imaging)
Sod or Turf Grass as it is more commonly known, is used extensively in sports and landscaping projects. Although natural sod has been replaced with synthetic turf in some cases, turf grass still is still the choice for many sports and landscaping projects. Just like any...
Project: SODSAT (ID: 605729)
Programme: Specific Programme "Capacities": Research for the benefit of SMEs
Last update: 12 August 2016

PROJECT

PROJECT

RADAR-CNS Remote Assessment of Disease and Relapse in Central Nervous System Disorders
ID: 115902
From: 1 April 2016 to: 31 March 2022
Background: Long term conditions require monitoring of patients, traditionally conducted in the clinic, to monitor treatment effects, adverse events and disease course. This can be inefficient and cumbersome – clinic visits may be too infrequent to identify individuals at...
Coordinated in: United Kingdom
Programme: SOCIETAL CHALLENGES - Health, demographic change and well-being, Innovative Medicines Initiative 2 (IMI2)
Last update: 2 February 2024

PROJECT

INTENT Intelligent Instruments: Understanding 21st-Century AI Through Creative Music Technologies
ID: 101001848
From: 1 September 2021 to: 31 August 2026
Artificial Intelligence is becoming increasingly human-like and it is now proficient in a key human activity: musical creativity. But what does this mean? How does creative AI change our notions of art, culture and society? As new machine learning technologies begin to mirror...
Coordinated in: Iceland
Programme: EXCELLENT SCIENCE - European Research Council (ERC)
Last update: 19 August 2022

PROJECT

IM-TWIN from Intrinsic Motivations to Transitional Wearable INtelligent companions for autism spectrum disorder
ID: 952095
From: 1 November 2020 to: 31 October 2023
The IM-TWIN project aims to develop some of the outcomes of the FET GOAL-Robots project towards market exploitation. The basic-research FET GOAL-Robots project aimed to study how intrinsic motivations ("curiosity") drive exploration and learning in children, and how such...
Coordinated in: Italy
Programme: EXCELLENT SCIENCE - Future and Emerging Technologies (FET), FET Proactive

Last update: 26 February 2023

PROJECT
RESULTS PACK

Breast cancer: EU funding for new tools and solutions

Breast cancer claims the lives of more European women than any other cancer: one in eight women in the EU will develop breast cancer before the age of 85. Data from the European Cancer Information System (ECIS) indicate more than 400 000 new cases were diagnosed in 2018. By improving the quality of breast cancer services in Europe, the European Commission Initiative on Breast Cancer (ECIBC) aims to help reduce the burden of cancer and decrease the avoidable differences in breast cancer incidence, prevalence, mortality and survival.
Available languages:
DEENESFRITPL
Last update: 18 September 2019

PROJECT
PROJECT

ORACLE Optimize risk prediction after myocardial infarction through artificial intelligence and multidimensional evaluation
ID: 101117469
From: 1 April 2024 to: 31 March 2029
Myocardial infarction (MI) is a leading cause of death worldwide. After MI, long-term antithrombotic therapy is crucial to prevent recurrent events, but increases bleeding, that also impacts morbidity and mortality. Giving these competing risks prediction tools to forecast...
Coordinated in: Spain
Programme: European Research Council (ERC)
Last update: 26 December 2023

PROJECT

WellCO Wellbeing and Health Virtual Coach
ID: 769765
From: 1 December 2017 to: 31 January 2021
WellCo delivers a radical new ICT-based solution in the provision of personalised advice, guidance and follow-up of users for the adoption of healthier behaviour choices that help them to maintain or improve their physical cognitive, mental and social well-being for as long as...
Coordinated in: Spain
Programme: SOCIETAL CHALLENGES - Health, demographic change and well-being, Active ageing and self-management of health
Last update: 22 August 2022

PROJECT

HeartMan Personal Decision Support System For Heart Failure Management
ID: 689660
From: 1 January 2016 to: 30 April 2019
1–2% of the developed world suffers from congestive heart failure (CHF), which is the most frequent cause of hospitalization in people aged over 65. CHF management involves medications, monitoring of fluid intake and weight, exercise and lifestyle modifications. Since most...
Coordinated in: Slovenia
Programme: SOCIETAL CHALLENGES - Health, demographic change and well-being, Active ageing and self-management of health
Last update: 15 August 2022

PROJECT

iHELP Personalised Health Monitoring and Decision Support Based on Artificial Intelligence and Holistic Health Records
ID: 101017441
From: 1 January 2021 to: 30 June 2024
The specific focus of iHELP is on early identification and mitigation of the risks associated with Pancreatic Cancer based on the application of advance AI-based learning and decision support techniques on the historic (primary) data of Cancer patients gathered from...

Coordinated in: Greece
Programme: SOCIETAL CHALLENGES - Health, demographic change and well-being, Individual awareness and empowerment for self-management of health
Last update: 24 January 2024

REPORT SUMMARY

PROJECT

RADAR-CNS Remote Assessment of Disease and Relapse in Central Nervous System Disorders
ID: 115902
From: 1 April 2016 to: 31 March 2022
Background: Long term conditions require monitoring of patients, traditionally conducted in the clinic, to monitor treatment effects, adverse events and disease course. This can be inefficient and cumbersome – clinic visits may be too infrequent to identify individuals at...
Coordinated in: United Kingdom
Programme: SOCIETAL CHALLENGES - Health, demographic change and well-being, Innovative Medicines Initiative 2 (IMI2)
Last update: 2 February 2024

PROJECT

SVDs-at-target Small vessel diseases in a mechanistic perspective: Targets for Intervention Affected pathways and mechanistic exploitation for prevention of stroke and dementia
ID: 666881
From: 1 January 2016 to: 31 December 2021
Stroke and dementia rank among the most pressing health issues in Europe. Cerebral small vessel diseases (SVDs) have emerged as a central link between these two major co-morbidities. SVDs account for more than 30% of strokes and at least 40% of dementia cases. They encounter...
Coordinated in: Germany
Programme: SOCIETAL CHALLENGES - Health, demographic change and well-being, Understanding health, wellbeing and disease
Last update: 22 January 2023

PROJECT

DIGI-B-CUBE Digital Enterprise Innovations for Bioimaging, Biosensing and Biobanking Industries
ID: 824920
From: 1 May 2019 to: 30 April 2022
DIGI-B-CUBE project aims to unlock the cross-sectoral collaborative potential of SMEs by combining Artificial Intelligence (AI), Cognitive Computing Digital Technologies (CCDT) with the Bioimaging-Biosensing-Biobanking (B-CUBE) and realted industries to deliver market...
Coordinated in: Norway
Programme: INDUSTRIAL LEADERSHIP - Innovation In SMEs, Enhancing the innovation capacity of SMEs
Last update: 29 August 2023

REPORT SUMMARY

PREPARE PERSONALIZED REHABILITATION VIA NOVEL AI PATIENT STRATIFICATION STRATEGIES
ID: 101080288
From: 1 June 2023 to: 31 May 2027
PREPARE aims at advancing rehabilitation care for patients with chronic non-communicable diseases. As rehabilitation is a complex, multifaceted, and highly personal process, we currently lack reliable patient stratification and outcome prediction tools. While big data...
Coordinated in: Greece
Programme: Health, Tools, Technologies and Digital Solutions for Health and Care, including personalised medicine
Last update: 29 August 2023

REPORT SUMMARY

Final Report Summary - ERRIC (Empowering Romanian Research on Intelligent Information Technologies)
The Faculty of Automatic Control and Computers (A&C) at the University "Politehnica" of Bucharest is already well known as both a national and regional centre of excellence in Intelligent Information Technologies. The main goal of the ERRIC project was to...
Project: ERRIC (ID: 264207)

Programme: Specific Programme "Capacities": Research potential of Convergence Regions
Last update: 7 May 2015

REPORT SUMMARY

Periodic Reporting for period 2 - LIVE INCITE (Lifestyle intervention in the perioperative process through digital service)

It is well known that health care outcomes in the perioperative care process correlate with severity of disease, operational procedure and co-morbidity as well as reduced effects of rehabilitation. Only recently, it has been proved that also the lifestyle factors of the...

Project: LIVE INCITE (ID: 727558)
Programme: SOCIETAL CHALLENGES - Health, demographic change and well-being
Last update: 8 April 2022

PROGRAMME

RELIEVE First Closed-loop non-Invasive Seizure Prevention System

ID: 101099481
From: 1 April 2023 to: 31 March 2026

The goal of Project RELIEVE is to build the very first non-invasive effective closed-loop monitoring and intervention system for brain-related disorders. The outcomes can be used to treat or manage various psychiatric and neurological disorders. We do this by pushing the...

Coordinated in: Czechia
Programme: The European Innovation Council (EIC)
Last update: 24 February 2023

RESULTS IN BRIEF

Reducing the risk of surgical error

New technology aims to reduce the risk of surgical error by using a combination of artificial intelligence and intraoperative neuromonitoring systems.

Project: BESAFE (ID: 847378)
Available languages:
DEENESFRITPL
Last update: 5 October 2020

PROJECT

AMPLify Allocation Made PracticaL

ID: 670077
From: 1 June 2016 to: 31 May 2021

Allocation Made PracticaLThe AMPLify project will lay the foundations of a new field, computational behavioural game theory that brings a computational perspective, computational implementation, and behavioural insights to game theory. These foundations will be laid by...

Coordinated in: Germany
Programme: EXCELLENT SCIENCE - European Research Council (ERC)
Last update: 23 July 2023

PROJECT

PROJECT

COVIRNA A diagnostic test to improve surveillance and care of COVID-19 patients

ID: 101016072
From: 1 November 2020 to: 30 April 2023

Coronavirus disease 2019 (COVID-19) caused by infection with SARS coronavirus 2 (SARS-CoV-2) has reached pandemic proportions with more than 7 million people infected and 0.4 million people killed worldwide. Death rates are accentuated by cardiovascular comorbidities and...

Coordinated in: Luxembourg
Programme: SOCIETAL CHALLENGES - Health, demographic change and well-being
Last update: 28 December 2023

PROJECT

TOXI-triage INTEGRATED AND ADAPTIVE RESPONSES TO TOXIC EMERGENCIES FOR RAPID TRIAGE: ENGINEERING THE ROADMAP FROM CASUALTY TO PATIENT TO SURVIVOR.

ID: 653409
From: 1 September 2015 to: 30 September 2019

The seven specific objectives of TOXI-triage address the operational; technological; ethical and societal dimensions of CBRN response and recovery, and importantly the economic base from which sustainable CBRN and multi-use systems are derived.19 partners in 4 Task forces will...
Coordinated in: United Kingdom
Programme: Secure societies - Protecting freedom and security of Europe and its citizens
Last update: 23 August 2022

PROJECT

HIPPOCRATES Health Initiatives in Psoriasis and PsOriatic arthritis ConsoRTium European States
ID: 101007757
From: 1 July 2021 to: 30 June 2026
Psoriatic Arthritis (PsA) is a clinically heterogeneous disease associated with diminished quality of life. Early diagnosis is challenging and prediction of natural history or therapeutic response to treatment is suboptimal: these represent critical, contemporary unmet...
Coordinated in: Ireland
Programme: SOCIETAL CHALLENGES - Health, demographic change and well-being, Innovative Medicines Initiative 2 (IMI2)
Last update: 28 December 2023

PROJECT

EUCAN-Connect A federated FAIR platform enabling large-scale analysis of high-value cohort data connecting Europe and Canada in personalized health
ID: 824989
From: 1 January 2019 to: 31 December 2023
Rapid progress in information and biotechnologies offers the promise of better, personalized health strategies using rich phenotypic, environmental and molecular (omics) profiles of every individual. To capitalize on this great promise, key challenge is to relate these...
Coordinated in: Netherlands
Programme: SOCIETAL CHALLENGES - Health, demographic change and well-being, Methods and data
Last update: 1 February 2024

PROJECT

TeNDER affecTive basEd iNtegrateD carE for betteR Quality of Life
ID: 875325
From: 1 November 2019 to: 30 April 2023
With an increasingly growing population in Europe, cognitive impairments as well as heart diseases are a major social and health issue. 1.2 million people in Europe are affected by Parkinson's disease (PD) while Alzheimer’s disease remains one of the biggest global public...
Coordinated in: Spain
Programme: SOCIETAL CHALLENGES - Health, demographic change and well-being, Active ageing, independent and assisted living, Optimising the efficiency and effectiveness of healthcare provision and reducing inequalities by evidence based decision making and dissemination of best practice, and innovative technologies and approaches
Last update: 18 December 2023

PROJECT DESCRIPTION

Predicting the aesthetic outcome of breast cancer surgery
Project: CINDERELLA (ID: 101057389)
Programme: Health
Available languages:
DEENESFRITPL
Last update: 30 January 2023

REPORT SUMMARY

Final Report Summary - BIOSCENT (BIOactive highly porous and injectable Scaffolds controlling stem cell recruitment, proliferation and differentiation and enabling angiogenesis for Cardiovascular ENgineered Tissues)
Congenital and acquired diseases of the heart, such as heart valve deterioration, large artery dysfunction and coronary artery blockage, are the leading causes of morbidity and mortality in Europe today, being the first cause of death in people above 60 years...
Project: BIOSCENT (ID: 214539)

Programme: Specific Programme "Cooperation": Nanosciences, Nanotechnologies, Materials and new Production Technologies
Last update: 20 January 2015

RESULTS IN BRIEF

The intrauterine link between maternal and child obesity

A better understanding of the link between maternal and offspring obesity could lead to more accurate and earlier identification of the women and infants most at risk, leading to tailored antenatal care.
Project: ObesityDevelop (ID: 669545)
Available languages:
DEENESFRITPL
Last update: 22 February 2022

REPORT SUMMARY

REPORT SUMMARY

Final Report Summary - EURIPIDES (European research initiative to develop imaging probes for early in-vivo diagnosis and evaluation of response to therapeutic substances)
Executive summary: Drug resistance is an important clinical problem. Globally, 50,000,000 people have epilepsy: current treatments are ineffective in 30%. Drug resistance is associated with higher rates of: unemployment, disadvantage, injury, somatic co-morbidity (affecting m...
Project: EURIPIDES (ID: 201380)
Programme: Specific Programme "Cooperation": Health
Last update: 1 July 2013

REPORT SUMMARY

Periodic Reporting for period 2 - BigMedilytics (Big Data for Medical Analytics)
The healthcare sector currently accounts for 10% of the EU's GDP. To improve productivity of the healthcare sector, it is necessary to reduce cost while maintaining or improving the quality of care. The most effective way to achieve this, is to use the knowledge that is...
Project: BigMedilytics (ID: 780495)
Programme: INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies - Information and Communication Technologies (ICT)
Last update: 22 November 2022

REPORT SUMMARY

sustAGE Smart environments for person-centered sustainable work and well-being
WISDOM Well-being improvement through the Integration of healthcare and reSearch Data and models with Out border for chronic iMmune-mediated diseases
ID: 101137154
From: 1 December 2023 to: 30 November 2028
Enabling integration of medical and research data, secure data sharing and leveraging responsible state-of-the-art artificial intelligence (AI)-mediated models opens immense possibilities to mitigate the impact of chronic immune-mediated diseases (CIMDs) affecting 10% of...
Coordinated in: Sweden
Programme: Health, Tools, Technologies and Digital Solutions for Health and Care, including personalised medicine
Last update: 18 January 2024

PROGRAMME

Periodic Reporting for period 1 - BRAINTEASER (BRinging Artificial INTelligencE home for a better cAre of amyotrophic lateral sclerosis and multiple SclERosis)
BRAINTEASER is a 48 months project that started on January 1st 2021, co-funded by the European Union's Horizon 2020 research (grant agreement No 101017598) under the domain of the Health, demographic change and well-being. The BRAINTEASER Project driven by 11 partners from 6...
Project: BRAINTEASER (ID: 101017598)
Programme: SOCIETAL CHALLENGES - Health, demographic change and well-being
Last update: 9 May 2022

REPORT SUMMARY

Periodic Reporting for period 1 - CANCER-RADIOMICS (Deep Learning for Automated Quantification of Radiographic Tumor Phenotypes)
What is the problem being addressed? One important reason for the slow progress in the fight against cancer, is the fact that cancer is a “moving target”. It is constantly evolving and diversifying, changing its phenotype, its genomic composition, and through metastatic...
Project: CANCER-RADIOMICS (ID: 866504)
Programme: EXCELLENT SCIENCE - European Research Council (ERC)
Last update: 29 April 2022

REPORT SUMMARY

AI for safer clinical decision-making in rehabilitation
Project: AISN (ID: 101057655)
Programme: Health
Available languages:
DEENESFRITPL
Last update: 24 April 2023
REPORT SUMMARY
Periodic Reporting for period 3 - FeatureCloud (Privacy preserving federated machine learning and blockchaining for reduced cyber risks in a world of distributed healthcare)
The digital revolution, in particular big data and artificial intelligence (AI), offers new opportunities to transform healthcare. However, it also harbours risks to the safety of sensitive clinical data stored in critical healthcare information and communication...
Project: FeatureCloud (ID: 826078)
Programme: SOCIETAL CHALLENGES - Health, demographic change and well-being
Last update: 28 November 2022

AI-PATH Artificial intelligence expert to boost growth of a high-potential digital diagnostics start-up
ID: 957075
From: 1 October 2020 to: 31 January 2022
Ellogon AI is an innovative start-up established in 2019 as a spin-off from University of Amsterdam, by leading academic experts in artificial intelligence, medical imaging, and computational pathology. The company develops a unique approach to analysis of complex...
Coordinated in: Netherlands
Programme: INDUSTRIAL LEADERSHIP - Innovation In SMEs, Enhancing the innovation capacity of SMEs
Last update: 27 December 2023

Last update Title
PROJECT
PROJECT
COVID-X COVID eXponential Programme
ID: 101016065
From: 1 November 2020 to: 31 October 2022
COVID-X will bridge the collaboration divide between eHealth solution providers -with emphasis on lean startups and small and medium-sized enterprises (SMEs)-, and the healthcare professional system to fight COVID-19. The purpose is to boost an end-to-end agile validation...
Coordinated in: Ireland
Programme: SOCIETAL CHALLENGES - Health, demographic change and well-being
Last update: 13 June 2023

PROJECT
PROJECT
WISDOM Well-being improvement through the Integration of healthcare and reSearch Data and models with Out border for chronic iMmune-mediated diseases
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Enabling integration of medical and research data, secure data sharing and leveraging responsible state-of-the-art artificial intelligence (AI)-mediated models opens immense possibilities to mitigate the impact of chronic immune-mediated diseases (CIMDs) affecting 10% of...
Coordinated in: Sweden

Programme: Health, Tools, Technologies and Digital Solutions for Health and Care, including personalised medicine
Last update: 18 January 2024

PROJECT

PHIRE Photoacoustic imaging and artificial intelligence-based theranostic approach for cancer
ID: 101113193
From: 1 September 2023 to: 31 August 2026
"Health programs crave for diagnostic imaging and eradication of chemoresistant neoplastic lesions smaller than 1 mm of size. PHIRE, based on the outcomes from EDIT (FET-OPEN-RIA, GA#801126), aims at bringing closer to market a novel high-resolution theranostic medical device...
Coordinated in: Italy
Programme: The European Innovation Council (EIC)
Last update: 11 July 2023

PROJECT

PROJECT

BAHCI Bringing a health claim to information: Measuring the impact of health data on the health outcomes of European citizens
ID: 795051
From: 1 August 2018 to: 31 July 2020
European Union Members States (EU-MS) share similar levels of development and access to care. Yet, key population health indicators vary widely across countries. The societal burden of these inequalities is high, and leveraging evidence to achieve better health outcomes is a...
Coordinated in: Belgium
Programme: EXCELLENT SCIENCE - Marie Skłodowska-Curie Actions, Nurturing excellence by means of cross-border and cross-sector mobility
Last update: 17 August 2022

PROJECT

FORGETDIABETES A BIONIC INVISIBLE PANCREAS TO FORGET DIABETES
ID: 951933
From: 1 October 2020 to: 31 March 2025
FORGETDIABETES introduces a radically new approach to Type 1 Diabetes (T1D) treatment, by developing an immuno-optimized, fully-implantable, fully-automated, Bionic Invisible Pancreas (BIP). BIP targets physiological intraperitoneal hormone delivery, enabling an optimal...
Coordinated in: Italy
Programme: EXCELLENT SCIENCE - Future and Emerging Technologies (FET), FET Proactive
Last update: 28 December 2022

PROJECT

4D PICTURE Design-based Data-Driven Decision-support Tools: Producing Improved Cancer Outcomes Through User-Centred Research
ID: 101057332
From: 1 October 2022 to: 30 September 2027
Patients with cancer often have to make complex decisions about treatment, with the options varying in risk profiles and effects on survival and quality of life. Data-driven decision-support tools (DSTs) have the potential to empower patients, support personalized care...
Coordinated in: Netherlands
Programme: Health, Health Care Systems
Last update: 29 July 2022

PROJECT

SLEEP REVOLUTION Revolution of sleep diagnostics and personalized health care based on digital diagnostics and therapeutics with health data integration
ID: 965417
From: 1 March 2021 to: 28 February 2025
Obstructive sleep apnea (OSA) is associated with various negative health consequences including increased risk of heart disease, hypertension and daytime sleepiness causing road accidents. The economic burden of OSA is rising as almost 1 billion people worldwide are estimated...
Coordinated in: Iceland

Programme: SOCIETAL CHALLENGES - Health, demographic change and well-being, Methods and data
Last update: 2 January 2024

PROJECT

ERIN Ethically Responsible INnovations in reproductive medicine
ID: 952516
From: 1 September 2020 to: 31 December 2023
ERIN project was initiated to spread the academic excellence to University of Tartu (UT) in Estonia as representative of the Widening country, by enhancing networking activities with internationally-leading counterparts, Karolinska Institute (Sweden) and Maastricht University...
Coordinated in: Estonia
Programme: Twinning of research institutions
Last update: 27 December 2023

PROJECT

TOXI-triage INTEGRATED AND ADAPTIVE RESPONSES TO TOXIC EMERGENCIES FOR RAPID TRIAGE: ENGINEERING THE ROADMAP FROM CASUALTY TO PATIENT TO SURVIVOR.
ID: 653409
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The seven specific objectives of TOXI-triage address the operational; technological; ethical and societal dimensions of CBRN response and recovery, and importantly the economic base from which sustainable CBRN and multi-use systems are derived.19 partners in 4 Task forces will...
Coordinated in: United Kingdom
Programme: Secure societies - Protecting freedom and security of Europe and its citizens
Last update: 23 August 2022

PROJECT
PROJECT

DIGIPARENT DIGIPARENT - Implementation, personalization and genetics of digitally assisted parent training intervention to improve child mental health services.
ID: 101020767
From: 1 November 2021 to: 31 October 2026
Childhood disruptive behavior problems pose huge challenge to societies given the high lifetime burden and costs associated. Mounting evidence shows that parent training is the most effective psychosocial treatment for these problems. However, most parents in need of such...
Coordinated in: Finland
Programme: EXCELLENT SCIENCE - European Research Council (ERC)
Last update: 25 May 2022

PROJECT

PRE-IMAGE Pre-transplant Renal Ex vivo Imaging and Multi-omics for Advanced Graft Evaluation
ID: 851368
From: 1 November 2020 to: 31 October 2025
There is a considerable shortage of deceased donor kidneys. Hence, more organs of marginal quality need to be considered for transplantation. Transplant centers are increasingly utilizing ex vivo normothermic machine perfusion to better preserve donor kidneys prior to...
Coordinated in: Netherlands
Programme: EXCELLENT SCIENCE - European Research Council (ERC)
Last update: 5 April 2023

PROJECT

InstrAct From instructions to actions: characterizing the spatiotemporal neural signatures of instructions following.
ID: 835767
From: 1 January 2020 to: 31 December 2021
From air traffic control to large surgery teams, some of the most advanced human collaborative achievements largely rely on our ability to successfully give and follow instructions. Given the combination of novelty, speed, complexity and efficiency, significant effort has been...
Coordinated in: Belgium
Programme: EXCELLENT SCIENCE - Marie Skłodowska-Curie Actions, Nurturing excellence by means of cross-border and cross-sector mobility

Last update: 24 July 2023

PROJECT

dAIbetes Federated virtual twins for privacy-preserving personalised outcome prediction of type 2 diabetes treatment

ID: 101136305

From: 1 January 2024 to: 31 December 2028

Virtual twins may be used as prognostic tools in precision medicine for personalised disease management. However, their training is a data hungry endeavour requiring big data to be integrated across diverse sources, which in turn is hampered by privacy legislation such as the...

Coordinated in: Germany

Programme: Health, Tools, Technologies and Digital Solutions for Health and Care, including personalised medicine

Last update: 8 January 2024

PROJECT

eCAP eCAP - Ehealth CAPsule for digestive disease diagnostics and therapy

ID: 101057525

From: 1 May 2022 to: 30 April 2026

eCAP aims to deliver a novel medical device which combines a smart capsule with an e-health platform for better diagnostics, patient powered disease management and hence, improved outcomes for patients with gastrointestinal (GI) diseases. Our project will create a modular...

Coordinated in: France

Programme: Health, Tools, Technologies and Digital Solutions for Health and Care, including personalised medicine

Last update: 29 July 2022

PROJECT

PrECISE PERSONALIZED ENGINE FOR CANCER INTEGRATIVE STUDY AND EVALUATION

ID: 668858

From: 1 January 2016 to: 31 December 2018

Despite of their great promise, high-throughput technologies in cancer research have often failed to translate to major therapeutic advances in the clinic. One challenge has been tumour heterogeneity, where multiple competing subclones coexist within a single tumour. Genomic...

Coordinated in: Austria

Programme: SOCIETAL CHALLENGES - Health, demographic change and well-being, Understanding health, wellbeing and disease

Last update: 15 August 2022

PROJECT

PROJECT

MES-CoBraD Multidisciplinary Expert System for the Assessment & Management of Complex Brain Disorders

ID: 965422

From: 1 April 2021 to: 30 September 2024

The Multidisciplinary Expert System for the Assessment & Management of Complex Brain Disorders (MES-CoBraD) is an interdisciplinary project combining Real-World Data (RWD) from multiple clinical and consumer sources through comprehensive, cost-efficient, and fast protocols...

Coordinated in: Greece

Programme: SOCIETAL CHALLENGES - Health, demographic change and well-being, Methods and data

Last update: 2 January 2024

PROJECT

Homi-lung Long-term alterations of host-microbiome interactions and cardiovascular and respiratory diseases progression after pneumonia

ID: 101137148

From: 1 January 2024 to: 31 December 2028

Challenges. The incidence of cardiovascular diseases (CVD) increases after infections, but causal mechanisms are not understood yet. Pneumonia, which can be acquired in the community (such as flu and COVID-19) or during hospitalization, is a leading cause of infectious...

Coordinated in: France

Programme: Health, Non-Communicable and Rare Diseases, Infectious Diseases, including poverty-related and neglected diseases
Last update: 17 January 2024

PROJECT

STOP STop Obesity Platform
ID: 823978
From: 1 March 2019 to: 28 February 2023
The STOP project will bring together an interdisciplinary and intersectoral group of subject matter experts from industry and academia under one umbrella, to address the health societal challenge of obesity with the specific objectives of mitigating the enormous and growing...
Coordinated in: Germany
Programme: EXCELLENT SCIENCE - Marie Skłodowska-Curie Actions, Stimulating innovation by means of cross-fertilisation of knowledge
Last update: 6 February 2024

PROJECT

PANCAIM Pancreatic cancer AI for genomics and personalized Medicine
ID: 101016851
From: 1 January 2021 to: 31 December 2024
The central PANCAIM concept is to successfully exploit available genomic and clinical data to improve personalized medicine of pancreatic cancer. PANCAIM's concept is unique as it integrates the whole spectrum of genomics with radiomics and pathomics, the three future...
Coordinated in: Netherlands
Programme: SOCIETAL CHALLENGES - Health, demographic change and well-being, Methods and data
Last update: 28 December 2023

PROJECT

PROJECT

TAXINOMISIS A multidisciplinary approach for the stratification of patients with carotid artery disease
ID: 755320
From: 1 January 2018 to: 31 December 2023
Carotid artery disease, the primary trigger of ischaemic cerebrovascular events including stroke, causes major morbidity, mortality and healthcare costs worldwide. Still, treatment is based on criteria established in the 90s that do not take into account the molecular...
Coordinated in: Greece
Programme: SOCIETAL CHALLENGES - Health, demographic change and well-being, Understanding health, wellbeing and disease
Last update: 1 February 2024

PROJECT

CARE-KNEEOA In Silico Clinically-Viable Assistive Tools for Prediction and Rehabilitation of Knee Osteoarthritis
ID: 101108335
From: 1 September 2024 to: 31 August 2027
Knee osteoarthritis (KOA) is a leading cause of disability worldwide, with ~14% prevalence in Europeans aged over 40. KOA prevalence continues to rise, thus far, with no cure or proven prevention protocols. Nonetheless, an aberrant knee mechanobiological environment is known...
Coordinated in: Finland
Programme: Marie Skłodowska-Curie Actions (MSCA)
Last update: 8 December 2023

PROJECT

INDIGO Innovative Training & Decision Support for Emergency operations
ID: 242341
From: 1 May 2010 to: 30 April 2013
The INDIGO project aims to research, develop and validate an innovative system integrating the latest advances in Virtual Reality, Simulation and Artificial Intelligence in order to homogenise and enhance both the operational preparedness and the management of an actual compl...
Coordinated in: France
Programme: Specific Programme "Cooperation": Security

Last update: 16 July 2019

PROJECT

RE-SAMPLE RE-SAMPLE
ID: 965315
From: 1 March 2021 to: 28 February 2025
Multi-morbid complex chronic conditions (CCCs) are highly prevalent in patients with Chronic Obstructive Pulmonary Disease (COPD). As they have common risk factors and overlapping symptoms, this easily leads to delay of appropriate treatment. Timely and preventive care is...
Coordinated in: Netherlands
Programme: SOCIETAL CHALLENGES - Health, demographic change and well-being, Methods and data
Last update: 27 December 2023

PROJECT

IMPACT Cardiogenomics meets Artificial Intelligence: a step forward in arrhythmogenic cardiomyopathy diagnosis and treatment
ID: 101115536
From: 1 October 2023 to: 30 September 2026
Arrhythmogenic cardiomyopathy (ACM) is a genetic disease characterized by progressive cardiomyocyte loss and fibrofatty replacement, which in turn lead to the occurrence of ventricular arrhythmias and sudden cardiac death (SCD), particularly in the young and athletes. At...
Coordinated in: Italy
Programme: The European Innovation Council (EIC)
Last update: 28 June 2023

PROJECT

SynaNet Neurologic and Psychiatric Disorders: from synapses to networks
ID: 692340
From: 1 January 2016 to: 31 December 2018
Neurologic and Psychiatric Disorders: from synapses to networks (SynaNet) aims to promote collaborative multidisciplinary and translational research by enhancing effective knowledge transfer, exchange of best research practices, and the mobility of early stage researchers...
Coordinated in: Portugal
Programme: Twinning of research institutions
Last update: 11 September 2023

PROJECT

REALMENT Using real-world big data from eHealth, biobanks and national registries, integrated with clinical trial data to improve outcome of severe mental disorders
ID: 964874
From: 1 June 2021 to: 31 May 2025
Mental disorders represent one of the largest burdens for the European Health Care system, due to large number of patients and a lack of efficient treatment options. Today, drug treatment of mental disorders is characterized by severe adverse effects and suboptimal response in...
Coordinated in: Norway
Programme: SOCIETAL CHALLENGES - Health, demographic change and well-being, Methods and data
Last update: 27 December 2023

PROJECT

BornToGetThere Implementation of early detection and early intervention service delivery in infants at risk for cerebral palsy to promote infants' psychomotor development and maternal health
ID: 848201
From: 1 January 2020 to: 31 December 2024
Despite advances in the medical management of high-risk pregnancies and deliveries, cerebral palsy (CP) remains the most common physical disability in childhood in high and low-to-middle income (LMIC). In addition, caregivers of children with CP are at higher risk of...
Coordinated in: Italy
Programme: SOCIETAL CHALLENGES - Health, demographic change and well-being, Health care provision and integrated care
Last update: 12 December 2023

PROJECT

PROJECT

i-PROGNOSIS Intelligent Parkinson eaRly detectiOn Guiding NOvel Supportive InterventionS

ID: 690494

From: 1 February 2016 to: 31 January 2020

Transition from healthy status to Parkinson's Disease (PD) is vaguely tractable, since symptoms can be so subtle in the early stages that they go unnoticed. Lack of biomarkers and/or findings on routine MRI and CT scans, PD is left undiagnosed for years, gradually affecting...

Coordinated in: Greece

Programme: SOCIETAL CHALLENGES - Health, demographic change and well-being, Active ageing and self-management of health

Last update: 7 September 2023

PROJECT

RADAR-AD Remote Assessment of Disease and Relapse – Alzheimer's Disease

ID: 806999

From: 1 January 2019 to: 30 June 2023

There is an urgent need for novel approaches assessing functional decline in early AD. The main goal of the RADAR-AD project is to develop a digital platform to detect subtle functional deficits in early Alzheimer's disease (AD) individuals by integrating a meaningful...

Coordinated in: United Kingdom

Programme: SOCIETAL CHALLENGES - Health, demographic change and well-being, Innovative Medicines Initiative 2 (IMI2)

Last update: 28 December 2023

PROJECT

CONTROL-MYOPIA Myopia control in the real world: treatments, target, timing, and terminus

ID: 101098324

From: 1 October 2023 to: 30 September 2028

Background: Myopia, or near-sightedness, is increasing dramatically all over the world, mostly due to higher levels of education and changing lifestyles of young generations. The expectation is that half of the world's citizens will be myopic by 2050. Myopia-related...

Coordinated in: Netherlands

Programme: European Research Council (ERC)

Last update: 4 October 2023

PROJECT

IM-TWIN from Intrinsic Motivations to Transitional Wearable INtelligent companions for autism spectrum disorder

ID: 952095

From: 1 November 2020 to: 31 October 2023

The IM-TWIN project aims to develop some of the outcomes of the FET GOAL-Robots project towards market exploitation. The basic-research FET GOAL-Robots project aimed to study how intrinsic motivations ("curiosity") drive exploration and learning in children, and how such...

Coordinated in: Italy

Programme: EXCELLENT SCIENCE - Future and Emerging Technologies (FET), FET Proactive

Last update: 26 February 2023

PROJECT

ProACT Integrated Technology Ecosystem for ProACTive Patient Centred Care

ID: 689996

From: 1 January 2016 to: 31 August 2019

ProACT targets Europe's 50 million multimorbid patients to proactively self-manage and offset the EU's annual €700billion cost of chronic disease management. ProACT aims at providing and evaluating an open application programming interface to integrate a variety of new...

Coordinated in: Ireland

Programme: SOCIETAL CHALLENGES - Health, demographic change and well-being, Health care provision and integrated care

Last update: 17 August 2022

PROJECT

PROJECT

PD_manager mhealth platform for Parkinson’s disease management
ID: 643706
From: 1 January 2015 to: 31 March 2018
PD_manager aims to build and evaluate an innovative, mhealth, patient centric ecosystem for Parkinson’s disease (PD) management. The analysis of experts’ diagnostic behaviour and the decomposition of tasks undertaken by the various actors during the disease management will...
Coordinated in: Slovenia
Programme: SOCIETAL CHALLENGES - Health, demographic change and well-being, Active ageing and self-management of health
Last update: 17 August 2022

PROJECT

CORE-MD Coordinating Research and Evidence for Medical Devices
ID: 965246
From: 1 April 2021 to: 31 March 2024
CORE–MD will translate expert scientific and clinical evidence on study designs for evaluating high-risk medical devices into advice for EU regulators, to achieve an appropriate balance between innovation, safety, and effectiveness. A unique collaboration between medical...
Coordinated in: France
Programme: SOCIETAL CHALLENGES - Health, demographic change and well-being, Methods and data
Last update: 28 December 2023

PROJECT

SEURO Scaling EUROpean citizen driven transferable and transformative digital integrated health and social care
ID: 945449
From: 3 May 2021 to: 2 May 2024
SEURO targets Europe’s 50 million multimorbid patients to proactively self-manage and offset the EU’s annual €700 billion cost of chronic disease management. SEURO aims to evaluate key factors to prepare organisations, localities and regions across the EU to scale...
Coordinated in: Ireland
Programme: SOCIETAL CHALLENGES - Health, demographic change and well-being, Methods and data
Last update: 27 December 2023

PROJECT

BETTER Better rEal-world healTh-daTa distributEd analytics Research platform
ID: 101136262
From: 1 December 2023 to: 31 May 2027
In recent years, data-driven medicine has gained increasing importance in terms of diagnosis, treatment, and research due to the exponential growth of healthcare data. The linkage of cross-border health data from various sources, including genomics, and analysis via innovative...
Coordinated in: Italy
Programme: Health, Tools, Technologies and Digital Solutions for Health and Care, including personalised medicine
Last update: 14 November 2023

PROJECT

STAMINA Demonstration of intelligent decision support for pandemic crisis prediction and management within and across European borders
ID: 883441
From: 1 September 2020 to: 28 February 2023
STAMINA develops an intelligent decision support toolset for pandemic prediction and management and demonstrates its use by practitioners at national and regional levels within and across EU borders. The STAMINA toolset enables national planners and first responders to...
Coordinated in: Greece
Programme: Secure societies - Protecting freedom and security of Europe and its citizens, Increase Europe's resilience to crises and disasters
Last update: 19 December 2023

PROJECT

MLFPM2018 Machine Learning Frontiers in Precision Medicine

ID: 813533
From: 1 January 2019 to: 31 March 2024
Healthcare is entering the digital era: More and more patient data, from the molecular level of genome sequences to the level of image phenotypes and health history, are available in digital form. Exploring this big health data promises to reveal new insights into disease...
Coordinated in: Switzerland
Programme: EXCELLENT SCIENCE - Marie Skłodowska-Curie Actions, Fostering new skills by means of excellent initial training of researchers
Last update: 13 June 2023

PROJECT

BD2Decide Big Data and models for personalized Head and Neck Cancer Decision support
ID: 689715
From: 1 January 2016 to: 30 September 2019
"Cancers of the Head and Neck Region (HNC) are the 6th more deadly cancers worldwide: in Europe ~150.000 new cases are detected and ~70.000 patients die every year. The main reasons for high mortality are the fact that the majority of cases are diagnosed in advanced Stage and...
Coordinated in: Italy
Programme: SOCIETAL CHALLENGES - Health, demographic change and well-being, Methods and data
Last update: 15 August 2022

PROJECT

AI CUrES AI to predict Cancer metastasis using Ultra-Echo-Sono imaging
ID: 101081529
From: 1 November 2022 to: 30 April 2024
Cancer metastasis is the leading cause of death within tumor disease and is currently an unmet clinical need. This dramatic clinical evidence requires immediate action in terms of early diagnosis and then pre-emptive therapies, not only for the primary tumor, but especially at...
Coordinated in: Italy
Programme: European Research Council (ERC)
Last update: 16 September 2022

PROJECT

SARAS Smart Autonomous Robotic Assistant Surgeon
ID: 779813
From: 1 January 2018 to: 31 December 2021
Currently during a laparoscopic operation, several units of medical personnel are requested to stay in the operating room for supporting the main surgeon teleoperating the surgical robot. In particular one assistant is always present for taking care of simple surgical...
Coordinated in: Italy
Programme: INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies - Information and Communication Technologies (ICT)
Last update: 25 November 2022

PROJECT
PROJECT

LifeChamps A Collective Intelligence Platform to Support Cancer Champions
ID: 875329
From: 1 December 2019 to: 30 November 2023
The steady increase in life expectancy, mean age and cancer survivorship across the developed countries together with evidence from cancer and geriatrics care research bring forward the urgent need to deal with the “age issue” as a key component of global cancer care...
Coordinated in: Greece
Programme: SOCIETAL CHALLENGES - Health, demographic change and well-being, Improving halth information and better use of health data, Transferring knowledge to clinical practice and scalable innovation actions
Last update: 18 December 2023

PROJECT
PROJECT
PROJECT

SGABU Increasing scientific, technological and innovation capacity of Serbia as a Widening country in the domain of multiscale modelling and medical informatics in biomedical engineering
ID: 952603
From: 1 October 2020 to: 31 December 2023
University of Kragujevac (UKG), Serbia and specifically the group of Prof. Nenad Filipovic is a research group active in the field of multiscale modeling and medical informatics in biomedical engineering. The group has published numerous studies in scientific journals and has...
Coordinated in: Serbia
Programme: Twinning of research institutions
Last update: 28 December 2023

PROJECT

WideHealth Widening Research on Pervasive and eHealth - WideHealth
ID: 952279
From: 1 January 2021 to: 30 June 2023
The WideHealth Project (Widening Research on Pervasive eHealth) will enable research exchanges and training activities on the topic of Pervasive and eHealth. The overarching goal of the project is to enable a new generation of researchers in the Widening Countries to develop...
Coordinated in: North Macedonia
Programme: Twinning of research institutions
Last update: 27 December 2023

PROJECT
PROJECT

NOCTURNO Non-Conventional Wave Propagation for Future Sensing and Actuating Technologies
ID: 777714
From: 1 January 2018 to: 30 June 2023
New sensing devices and technologies are the key in addressing numerous challenges that agriculture is facing today. Namely, to provide more food for the ever-growing population, a number of biophysical parameters of plants, soil and food products need to be monitored and...
Coordinated in: Serbia
Programme: EXCELLENT SCIENCE - Marie Skłodowska-Curie Actions, Stimulating innovation by means of cross-fertilisation of knowledge
Last update: 28 December 2023

PROJECT
PROJECT

NeuroDeRisk Neurotoxicity De-Risking in Preclinical Drug Discovery
ID: 821528
From: 1 March 2019 to: 30 September 2022
The adverse effects of pharmaceuticals on the central or peripheral nervous systems are poorly predicted by the current in vitro and in vivo preclinical studies performed during Research and Development (R&D) process. Therefore, increasing the predictivity of the preclinical...
Coordinated in: Austria
Programme: SOCIETAL CHALLENGES - Health, demographic change and well-being, Innovative Medicines Initiative 2 (IMI2)
Last update: 11 December 2023

PROJECT
PROJECT

PIC Personalised In-Silico Cardiology
ID: 764738
From: 1 September 2017 to: 28 February 2022
Improving healthcare systems mandates a shift towards personalised and preventive management of disease. Specifically, the management of cardiovascular diseases has a huge impact on European society in terms of mortality, morbidity and healthcare costs, being responsible for...
Coordinated in: United Kingdom
Programme: EXCELLENT SCIENCE - Marie Skłodowska-Curie Actions, Fostering new skills by means of excellent initial training of researchers
Last update: 28 February 2023

PROJECT

PROJECT

Newlife New remote non-invasive monitoring solutions for ensuring the health of mothers and babies before and after birth

ID: 101095792

From: 1 January 2023 to: 31 December 2025

There is increasing focus on the well being of mothers and babies, both before and after delivery and early detection ofpathologies to prevent mother and perinatal morbidity and mortality. The overall well being of mothers also has longer termimpact: women who remain healthy...

Coordinated in: Netherlands

Programme: Digital, Industry and Space, Key Digital Technologies

Last update: 24 May 2023

PROJECT

NADIR New directions for deep learning in cancer research through concept explainability and virtual experimentation.

ID: 101114631

From: 1 January 2024 to: 31 December 2028

Deep learning (DL) is rapidly transforming cancer research and oncology. DL can extract subtle visual features from preclinical and clinical image data. In my junior research group, I have developed end-to-end DL methods to predict molecular biomarkers and clinical outcomes...

Coordinated in: Germany

Programme: European Research Council (ERC)

Last update: 26 December 2023

PROJECT

PROJECT

LEGENDARE Leveraging genomic discoveries and skeletal phenotyping to improve osteoporosis patient care

ID: 101021500

From: 1 November 2021 to: 31 October 2026

Osteoporosis is a silent, systemic skeletal disease leading to fragility fracture. While the deleterious consequences for the individual, their families and society are well established, the causes of the disease remain elusive. Despite exhaustive clinical, epidemiological and...

Coordinated in: Netherlands

Programme: EXCELLENT SCIENCE - European Research Council (ERC)

Last update: 22 September 2022

PROJECT

END-VOC ENDING COVID 19 VARIANTS OF CONCERN THROUGH COHORT STUDIES: END-VOC

ID: 101046314

From: 1 May 2022 to: 30 April 2025

The END-VOC consortium will support the European and global response to the COVID-19 pandemic and Variants of Concern (VOC) through well characterised cohorts and linked with existing European and international initiatives. END-VOC consists of 19 partners in Europe (UK, Spain...

Coordinated in: United Kingdom

Programme: Health, Infectious Diseases, including poverty-related and neglected diseases

Last update: 4 September 2022

PROJECT

AI-POD Trustworthy AI Tools for the Prediction of Obesity Related Vascular Diseases

ID: 101080302

From: 1 May 2023 to: 30 April 2027

Weight problems and obesity are increasing at a rapid rate already concerning more than 436mio people in European countries. Obese persons have a 50% higher risk of cardio-vascular disease (CVD) mortality and treatment costs result in a total economic burden of over 210...

Coordinated in: Germany

Programme: Health, Health throughout the Life Course

Last update: 29 June 2023

PROJECT

MISTRAL a toolkit for dynaMic health Impact analysiS to predicT disability-Related costs in the Aging population based on three case studies of steeL-industry exposed areas in europe
ID: 101095119
From: 1 January 2023 to: 31 December 2026
The environment is one of the most crucial determinants of health. The Global Burden of Disease report estimates an emerging impact in terms of disability and reducing the quality of life worldwide, particularly for the aging populations. One of the root causes of this decline...
Coordinated in: Italy
Programme: Health, Environmental and Social Health Determinants
Last update: 9 December 2022

PROJECT

STRATUM 3D Decision Support Tool for Brain Tumor Surgery
ID: 101137416
From: 1 December 2023 to: 30 November 2028
Integrated digital diagnostics can support complex surgeries in many anatomies where brain tumour surgery is one of the most complex cases. Neurosurgeons face several challenges during brain tumour surgeries, such as critical tissue and brain tumour margins differentiation or...
Coordinated in: Spain
Programme: Health, Tools, Technologies and Digital Solutions for Health and Care, including personalised medicine
Last update: 8 January 2024

PROJECT

TeleRehaB DSS TeleRehabilitation of Balance clinical and economic Decision Support System
ID: 101057747
From: 1 December 2022 to: 30 November 2025
TeleRehaB DSS targets the promotion of AI adoption in everyday clinical practice for balance rehabilitation training. An AI-based decision support system (DSS) will be developed expanding upon the existing Augmented Reality (AR) rehabilitation training platform, with its...
Coordinated in: Greece
Programme: Health, Tools, Technologies and Digital Solutions for Health and Care, including personalised medicine
Last update: 16 November 2022

PROJECT

ALAMEDA Bridging the Early Diagnosis and Treatment Gap of Brain Diseases via Smart, Connected, Proactive and Evidence-based Technological Interventions
ID: 101017558
From: 1 January 2021 to: 31 December 2023
Direct costs of brain disorders make up for 60% of the total costs – which EBC estimated at 800 bln€/year in Europe. At European level, this health budget far exceeds that of cardiovascular diseases, brain diseases and diabetes together. ALAMEDA will research, develop and...
Coordinated in: Greece
Programme: SOCIETAL CHALLENGES - Health, demographic change and well-being, Individual awareness and empowerment for self-management of health
Last update: 28 December 2023

PROJECT

TRUSTING A TRUSTworthy speech-based AI monitorING system for the prediction of relapse in individuals with schizophrenia
ID: 101080251
From: 1 July 2023 to: 31 December 2028
Schizophrenia affects a staggering 21 million people worldwide, with 80% of these citizens suffering from a relapsing disease, putting their health and safety at enormous risk. Timely detection of these psychotic relapses would require very frequent contact with clinicians...
Coordinated in: Netherlands
Programme: Health, Health throughout the Life Course
Last update: 29 June 2023

PROJECT

REPO4EU Precision drug REPurpOsing For EUrope and the world
ID: 101057619
From: 1 September 2022 to: 31 August 2029
Here we, a group of long-standing collaborators in innovative drug repurposing, propose to build REPO4EU, a comprehensive European/global platform for validated precision drug repurposing open to stakeholders for information, multimedia training, matchmaking and cooperation...
Coordinated in: Netherlands
Programme: Health, Tools, Technologies and Digital Solutions for Health and Care, including personalised medicine
Last update: 4 September 2022

PROJECT

GaitREHub Intelligent Wearable System for Enhanced Personalized Gait Rehabilitation
ID: 101086348
From: 1 January 2023 to: 31 December 2026
One common consequence of specific medical conditions such as stroke or other brain injuries, and certain operations, is the need for post event rehabilitation. In many cases, the inability to walk properly requires professionally monitored gait rehabilitation. Gait...
Coordinated in: Serbia
Programme: Marie Skłodowska-Curie Actions (MSCA)
Last update: 10 October 2022

PROJECT

NextGen NEXT GENERATION TOOLS FOR GENOME-CENTRIC MULTIMODAL DATA INTEGRATION IN PERSONALISED CARDIOVASCULAR MEDICINE
ID: 101136962
From: 1 January 2024 to: 31 December 2027
Healthcare is the fasted growing EU27 expenditure. Personalised medicine, comprising tailored approaches for prevention, diagnosis, monitoring and treatment is essential to reduce the burden of disease and improve the quality of life. Integration of multiple data types...
Coordinated in: Netherlands
Programme: Health, Tools, Technologies and Digital Solutions for Health and Care, including personalised medicine
Last update: 8 January 2024

PROJECT

PRE-ACT PRE-ACT: Prediction of Radiotherapy side Effects using explainable AI for patient Communication and Treatment modification
ID: 101057746
From: 1 October 2022 to: 30 September 2027
Radiotherapy is a widely used cancer treatment, however some patients suffer side effects. In breast cancer, side effects can include breast atrophy, arm lymphedema, and heart damage. Some factors that increase risk for side effects are known, but current approaches do not...
Coordinated in: Greece
Programme: Health, Tools, Technologies and Digital Solutions for Health and Care, including personalised medicine
Last update: 4 September 2022

PROJECT

HERMES Hybrid Enhanced Regenerative Medicine Systems
ID: 824164
From: 1 January 2019 to: 31 December 2024
Brain disorders are the most invalidating condition, exceeding HIV, cancer and heart ischemia, with significant impact on society and public health. Regenerative medicine is a promising branch of health science that aims at restoring brain function by rebuilding brain tissue...
Coordinated in: Italy
Programme: EXCELLENT SCIENCE - Future and Emerging Technologies (FET), FET Proactive
Last update: 1 February 2024

PROJECT

FEMaLe Finding Endometriosis using Machine Learning
ID: 101017562
From: 1 January 2021 to: 31 December 2024
The framework 'P4 Medicine' (predictive, preventative, personalized, participatory) was developed to detect and prevent disease through close monitoring, deep statistical analysis, biomarker testing, and patient health coaching to best use the limited healthcare resources and...
Coordinated in: Denmark
Programme: SOCIETAL CHALLENGES - Health, demographic change and well-being, Individual awareness and empowerment for self-management of health
Last update: 30 January 2024

PROJECT

ENT1DEP ENTEROVIRUS-LINKED TYPE 1 DIABETES EXPOSED -MECHANISMS AND PREVENTION
ID: 101137457
From: 1 January 2024 to: 31 December 2027
ENT1DEP aims to define causal links between infections and NCDs by focusing on enterovirus (EV) infections and type 1 diabetes (T1D), a robust association without proof of causality. Causality is addressed by a multidisciplinary, multi-layer approach, using in-vitro and...
Coordinated in: Finland
Programme: Health, Non-Communicable and Rare Diseases, Infectious Diseases, including poverty-related and neglected diseases
Last update: 8 January 2024

PROJECT

TROPHY ulTRafast hOlograPHic FTIR microscopY
ID: 101047137
From: 1 September 2022 to: 28 February 2026
Many human pathologies such as cancer are due to complex biochemical alterations that start at a sub-cellular level and lead to progressive changes that result in a heterogeneous tumor composition. The polyclonality of tumor cells hampers the diagnosis and the therapy giving...
Coordinated in: Italy
Programme: The Pathfinder for Advanced Research, The European Innovation Council (EIC)
Last update: 28 July 2022

PROJECT

PAL Personal Assistant for healthy Lifestyle (PAL)
ID: 643783
From: 1 March 2015 to: 28 February 2019
Type 1 Diabetes Mellitus (T1DM) portraits a high need and challenge for self-management by young patients: a complex illness with a high and increasing prevalence, a regimen that needs adaptation to patient’s condition and activities, and serious risks for complications and...
Coordinated in: Netherlands
Programme: SOCIETAL CHALLENGES - Health, demographic change and well-being, Active ageing and self-management of health
Last update: 15 August 2022

PROJECT

AIDD Advanced machine learning for Innovative Drug Discovery
ID: 956832
From: 1 January 2021 to: 31 March 2025
"The dramatic increase in using of Artificial Intelligence (AI) and machine learning methods in different fields of science becomes an essential asset in the development of the chemical industry, including pharmaceutical, agro biotech, and other chemical companies. However...
Coordinated in: Germany
Programme: EXCELLENT SCIENCE - Marie Skłodowska-Curie Actions, Fostering new skills by means of excellent initial training of researchers
Last update: 2 January 2024

PROJECT

PROJECT

PROJECT

PROJECT

AIDPATH Artificial Intelligence-driven, Decentralized Production for Advanced Therapies in the Hospital
ID: 101016909
From: 1 January 2021 to: 31 December 2024
AIDPATH (Artificial Intelligence-driven, Decentralized Production for Advanced Thera-pies in the Hospital) is a high-energy EU consortium, dedicated to enable and to augment the next-generation of personalized medicine at EU hospitals through the use of AI tech-nology. The...
Coordinated in: Germany
Programme: INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies - Information and Communication Technologies (ICT)
Last update: 27 December 2023

PROJECT
PROJECT

SensCare AI-based wearable sensors for continuous monitoring of diabetes and cardiovascular diseases
ID: 101113995
From: 1 July 2023 to: 31 March 2024
Cardiovascular diseases (CVDs) are the leading cause of death in Europe, with a total of 3.9 million deaths yearly, accounting for 45% of all deaths. Diabetes is another widely spread disease affecting 60 million people in the EU (10% of the total population). Diabetes is the...
Coordinated in: Türkiye
Programme: European innovation ecosystems
Last update: 28 June 2023

PROJECT
PROJECT

DigitalHealthEurope DigitalHealthEurope: Support to a Digital Health and Care Innovation initiative in the context of Digital Single Market strategy
ID: 826353
From: 1 January 2019 to: 30 September 2021
DigitalHealthEurope will provide comprehensive, centralised support to the digital transformation of health and care (DTHC) priorities of the Digital Single Market. The partners bring a broad range of collective knowledge and expertise, originating from the longstanding...
Coordinated in: Germany
Programme: Improving scientific tools and methods to support policy making and regulatory needs, SOCIETAL CHALLENGES - Health, demographic change and well-being, Active ageing, independent and assisted living, Improving halth information and better use of health data, Individual awareness and empowerment for self-management of health
Last update: 25 April 2022

PROJECT

MONALISA A SIOPEN pragmatic clinical trial to MOnitor NeuroblastomA relapse with LIquid biopsy Sensitive Analysis
ID: 101137028
From: 1 January 2024 to: 31 December 2028
High-risk neuroblastoma accounts for 15% of cancer related-deaths in children. Half of the >1500 patients yearly diagnosed with neuroblastoma in the EU have high-risk disease, which will relapse or progress in half these cases after first-line treatment. Relapsed neuroblastoma...
Coordinated in: Belgium
Programme: Health
Last update: 8 January 2024

PROJECT
PROJECT

AffecTech Personal Technologies for Affective Health
ID: 722022
From: 1 January 2017 to: 31 March 2021
Personalized health is a European priority and one of the strategic research areas for Horizon 2020. This project advances the state-of-the-art of personal health technologies for affective disorders, estimated to be the highest ranking cause of disease by 2020. It marks a...
Coordinated in: United Kingdom

Programme: EXCELLENT SCIENCE - Marie Skłodowska-Curie Actions, Fostering new skills by means of excellent initial training of researchers
Last update: 19 October 2022

PROJECT

PHOOTONICS A Cost-Effective Photonics-based Device for Early Prediction, Monitoring and Management of Diabetic Foot Ulcers
ID: 871908
From: 1 November 2019 to: 30 June 2024
Early prediction and management of Diabetic Foot Ulcers (DFUs) is an important health factor of Europe. Recent clinical trials have concluded that NIR sensing captures oxy(deoxy)haemoglobin (HbO2, Hb) and peripheral/ tissue oxygen saturations (StO2, SpO2), thermal Infrared-IR...
Coordinated in: Lithuania
Programme: INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies - Information and Communication Technologies (ICT)
Last update: 5 February 2024

PROJECT

AMECRYS Revolutionising Downstream Processing of Monoclonal Antibodies by Continuous Template-Assisted Membrane Crystallization
ID: 712965
From: 1 October 2016 to: 31 March 2021
Separation and purification of biopharmaceuticals is today one of the most time and cost intense Downstream Processing (DSP) operations in the manufacture of commercial products. Separation and purification of proteins is usually achieved chromatographically, with all of its...
Coordinated in: Italy
Programme: EXCELLENT SCIENCE - Future and Emerging Technologies (FET), FET Open
Last update: 23 August 2022

PROJECT

RAMCIP Robotic Assistant for MCI patients at home
ID: 643433
From: 1 January 2015 to: 30 June 2018
RAMCIP will research and develop a novel domestic service robot, with the aim to proactively and discreetly assist older persons, MCI and AD patients in their every day life. Instead of simply being an obedient servant, the RAMCIP robot will have high-level cognitive...
Coordinated in: Greece
Programme: SOCIETAL CHALLENGES - Health, demographic change and well-being, Active ageing and self-management of health
Last update: 5 April 2023

PROJECT

SMART BEAR Smart Big Data Platform to Offer Evidence-based Personalised Support for Healthy and Independent Living at Home
ID: 857172
From: 1 September 2019 to: 31 August 2024
It is a fact that the European population growth is slowing down, while the population ageing accelerates. Rapid increases in the elderly population are predicted for the coming decades due to the ageing of post-war baby births. Within Europe’s ageing population, Hearing...
Coordinated in: Italy
Programme: SOCIETAL CHALLENGES - Health, demographic change and well-being, Active ageing, independent and assisted living, Future Internet: Software, hardware, Infrastructures, technologies and services
Last update: 12 December 2023

PROJECT

HEIR A SECURE HEALTHCARE ENVIRONMENT FOR INFORMATICS RESILIENCE
ID: 883275
From: 1 September 2020 to: 31 August 2023

The health sector is steadily becoming the de facto target for cyberattacks. Based on the most recent ENISA report at the end of 2018, cybersecurity incidents have shown that the healthcare sector is one of the most vulnerable. Focusing specifically on Electronic Medical...
Coordinated in: France
Programme: Ensure privacy and freedom, including in the Internet and enhance the societal, legal and ethical understanding of all areas of security, risk and management, Improve cyber security, Secure societies - Protecting freedom and security of Europe and its citizens
Last update: 2 January 2024

PROJECT

ENDOMIX Understanding how endocrine disruptors and chemical mixtures of concern target the immune system to trigger or perpetuate disease
ID: 101136566
From: 1 January 2024 to: 31 December 2027
The ENDOMIX project addresses the urgent need to understand the true impact of endocrine disrupting chemicals (EDCs) on human health in order to inform regulators and advise citizens. ENDOMIX will tackle this challenge by revealing associations and causality between EDCs and...
Coordinated in: Germany
Programme: Health, Health throughout the Life Course, Environmental and Social Health Determinants
Last update: 17 January 2024

PROJECT

MINIGRAPH Minimally Invasive Neuromodulation Implant and implantation procedure based on ground-breaking GRAPHene technology for treating brain disorders
ID: 101070865
From: 1 October 2022 to: 30 September 2025
Neurostimulation therapies hold the promise to treat brain diseases refractory to pharmacological treatment. However, these therapies are not fully adopted due to important technological and clinical challenges, such as highly invasive implantation, multiple side effects due...
Coordinated in: Spain
Programme: The European Innovation Council (EIC)
Last update: 23 August 2022

PROJECT

PICASO A Personalised Integrated Care Approach for Service Organisations and Care Models for Patients with Multi-Morbidity and Chronic Conditions
ID: 689209
From: 1 February 2016 to: 30 June 2019
The vision of the PICASO project is that it will become a Europe-wide Continuum of Care service platform that:will improve cooperation and exchange of knowledge between professional caregivers in health, rehabilitation and social care domains and actively include patients and...
Coordinated in: Germany
Programme: SOCIETAL CHALLENGES - Health, demographic change and well-being, Health care provision and integrated care
Last update: 15 August 2022

PROJECT

ebeam4therapy Very High Energy Electrons Beam for Radiotherapy
ID: 101056951
From: 1 August 2022 to: 31 July 2025
Despite advanced treatment planning and delivery, conventional oncologic radiotherapy (RT) is limited by acute toxicity and long-term side effects caused by radiation delivery to healthy tissues, which often restricts the ability to deliver a sufficient dose of radiation to...
Coordinated in: Israel
Programme: The European Innovation Council (EIC)
Last update: 28 July 2022

PROJECT

PROJECT

PROJECT

PREDICT A new era in personalised medicine: Radiomics as decision support tool for diagnostics and theranostics in oncology

ID: 766276

From: 1 October 2017 to: 31 March 2022

The high degree of tumour (genomic and phenotypic) heterogeneity influences patient's response to therapy and hampers wide deployment of personalised medicine for cancer treatment. Thus, there is an imperative need for new technologies that can accurately detect tumour...

Coordinated in: Netherlands

Programme: EXCELLENT SCIENCE - Marie Skłodowska-Curie Actions, Fostering new skills by means of excellent initial training of researchers

Last update: 10 March 2023

PROJECT

Sano Centre for New Methods in Computational Diagnostics and Personalised Therapy

ID: 857533

From: 1 August 2019 to: 31 July 2026

This proposal describes the creation in Kraków, Poland, of a centre for Computational Medicine. The Centre will be a major driver for European advancement in this rapidly growing sector, developing sophisticated engineering methods for the prevention, diagnosis and treatment...

Coordinated in: Poland

Programme: Teaming of excellent research institutions and low performing RDI regions

Last update: 15 January 2024

PROJECT

VALIDATE V A L I D A T E - Validation of a Trustworthy AI-based Clinical Decision Support System for Improving Patient Outcome in Acute Stroke Treatment

ID: 101057263

From: 1 May 2022 to: 30 April 2026

Based on previously developed models and an existing prototype of a clinical decision support system (patent pending), we set out in this project to further develop, test, and validate this clinical decision support for the treatment stratification of acute stroke patients to...

Coordinated in: Germany

Programme: Health, Tools, Technologies and Digital Solutions for Health and Care, including personalised medicine

Last update: 2 August 2022

PROJECT

PROJECT

GrowMeUp GrowMeUp

ID: 643647

From: 1 February 2015 to: 31 January 2018

GrowMeUp's main aim is to increase the years of independent and active living, and the quality of life of older persons (age of 65+) with light physical or mental health problems who live alone at home and can find pleasure and relief in getting support or stimulation to...

Coordinated in: Portugal

Programme: SOCIETAL CHALLENGES - Health, demographic change and well-being, Active ageing and self-management of health

Last update: 7 December 2023

PROJECT

iBILD iBILD: Imaging Biomarker for Intelligent Lung Cancer Detection

ID: 719496

From: 1 April 2016 to: 30 September 2016

Lung cancer is one of the most common cancers with the highest mortality rate both in Europe and Worldwide. In 2012, 449,000 new cases were diagnosed with 388,000 deaths recorded in Europe alone. The reason for the 86% mortality rate is that most lung cancers are detected only...

Coordinated in: United Kingdom

Programme: SOCIETAL CHALLENGES - Health, demographic change and well-being, Treating and managing disease

Last update: 11 August 2022

PROJECT

TissueMaps Integrating spatial and genetic information via automated image analysis and interactive visualization of tissue data

ID: 682810

From: 1 April 2016 to: 31 March 2022

Digital imaging of tissue samples and genetic analysis by next generation sequencing are two rapidly emerging fields in pathology. The exponential growth in digital imaging in pathology is catalyzed by more advanced imaging hardware, comparable to the complete shift from...

Coordinated in: Sweden

Programme: EXCELLENT SCIENCE - European Research Council (ERC)

Last update: 22 September 2022

PROJECT

PROJECT

4-IN THE LUNG RUN 4-IN THE LUNG RUN: towards INdividually tailored INvitations, screening INtervals, and INtegrated co-morbidity reducing strategies in lung cancer screening

ID: 848294

From: 1 January 2020 to: 31 December 2024

With 338,000 EU-deaths annually, lung cancer is a devastating problem. CT screening has the potential to prevent ten-thousands of lung cancer deaths annually. The positive results of the Dutch-Belgian screening trial (NELSON), with relatively low referral rates, and the NLST...

Coordinated in: Netherlands

Programme: SOCIETAL CHALLENGES - Health, demographic change and well-being, Preventing disease

Last update: 15 January 2024

PROJECT

PROJECT

LEOPARD Liver Electronic Offering Platform with Artificial intelligence-based Devices

ID: 101080964

From: 1 November 2023 to: 31 October 2028

Liver transplantation (LT) is a life-saving procedure for decompensated cirrhosis (DC) and hepato-cellular carcinoma (HCC). Its efficacy is hampered by the risk of death/drop-out on the Wait List (WL). This risk is driven by organ shortage and is mitigated by organ offering...

Coordinated in: France

Programme: Health, Tools, Technologies and Digital Solutions for Health and Care, including personalised medicine

Last update: 1 November 2023

PROJECT

TransQST Translational quantitative systems toxicology to improve the understanding of the safety of medicines - Sofia: 116030

ID: 116030

From: 1 January 2017 to: 31 August 2022

TransQST will develop a Quantitative Systems Toxicology (QST) approach, employing pre-existing data where possible, in order to yield new mechanistic insight into drug-induced toxicity. A central tenet of our programme will be to ensure the human physiological and...

Coordinated in: United Kingdom

Programme: SOCIETAL CHALLENGES - Health, demographic change and well-being, Innovative Medicines Initiative 2 (IMI2)

Last update: 7 December 2023

PROJECT

FBI Multimodal, Functional Bio-Photonic Imaging

ID: 721766

From: 1 October 2016 to: 31 March 2021

FBI fosters education of ESRs on an emerging, multimodal imaging platform and its translation into clinical and biological applications. In FBI, 15 ESRs are trained at world-leading European academic institutions and companies, thus forming strong interdisciplinary relations...

Coordinated in: Denmark

Programme: EXCELLENT SCIENCE - Marie Skłodowska-Curie Actions, Fostering new skills by means of excellent initial training of researchers
Last update: 23 August 2022

PROJECT

DEFINITIVE Diagnostic HER2DX-guided treatment for patients with early-stage HER2-positive breast cancer
ID: 101136953
From: 1 December 2023 to: 30 November 2028
HER2+ breast cancer affects around 390.000 women annually worldwide (i.e. 3 patients every 4 minutes). Over the last decade, polychemotherapy and HER2-targeted therapies have improved patient´s survival; however, the reality is that most patients are cured with less intense...
Coordinated in: Spain
Programme: Health
Last update: 8 January 2024

PROJECT

PROJECT

MARVEL Evolving reversible iMmunocapture by membrane sensing peptides: towARds scalable extracellular VEsicLes isolation
ID: 951768
From: 1 November 2020 to: 30 April 2023
Extracellular vesicles (EV) are submicron membrane vesicles released by most cells with a fundamental role in cell-to-cell communication. Much interest is flourishing towards their exploitation in regenerative medicine and diagnostics. However, the fulfilment of the EV promise...
Coordinated in: Italy
Programme: EXCELLENT SCIENCE - Future and Emerging Technologies (FET), FET Proactive
Last update: 27 December 2023

PROJECT

EOSC4Cancer A European-wide foundation to accelerate Data-driven Cancer Research
ID: 101058427
From: 1 September 2022 to: 28 February 2025
Cancer complex nature requires integration of advanced research data across national boundaries to enable progress. Indeed, the Horizon Europe mission board for cancer has identified access to data, knowledge and digital services - accessible across the European Research Area...
Coordinated in: Spain
Programme: Research infrastructures, Consolidating and Developing the Landscape of European Research Infrastructures
Last update: 10 March 2023

PROJECT

PROJECT

INNO4COV-19 Boosting Innovation for COVID-19 Diagnostic, Prevention and Surveillance.
ID: 101016203
From: 1 October 2020 to: 30 November 2022
The novel corona virus causing COVID-19 overwhelmed Europe and the world in just a few weeks' time. Small and Medium-sized Entrerprises (SMEs are put at very high risk by the slowdown or shutdown of economic life in their countries – exactly those companies who ensure the...
Coordinated in: Portugal
Programme: SOCIETAL CHALLENGES - Health, demographic change and well-being
Last update: 28 December 2023

PROJECT

COMFORT COMputational Models FOR patienT stratification in urologic cancers – Creating robust and trustworthy multimodal AI for health care
ID: 101079894
From: 1 April 2023 to: 31 March 2027
In the EU, treating patients with prostate (PCa) and kidney cancer (KC) costs more than €6.6 billion annually. Yet, PCa and KC are often managed inadequately, which is associated with high costs and negative consequences such as hospitalisation, psychosocial stress and...
Coordinated in: Germany

Programme: Health, Tools, Technologies and Digital Solutions for Health and Care, including personalised medicine
Last update: 29 June 2023

PROJECT

EPHOR Exposome project for health and occupational research
ID: 874703
From: 1 January 2020 to: 30 June 2025
Exposures at the workplace contribute to many non-communicable diseases (NCDs) with a similar magnitude as urban air pollution or obesity. Given the associated societal and economic (2-6% GDP) pressure, ensuring a healthy work environment is a strategic goal for the European...
Coordinated in: Netherlands
Programme: SOCIETAL CHALLENGES - Health, demographic change and well-being, Preventing disease
Last update: 29 December 2023

PROJECT

ELGN-GI A first-in-class therapy for intestinal malabsorption in premature newborns
ID: 190151578
From: 1 November 2022 to: 31 October 2024
Around 10% babies are born preterm, and premature birth is the 1st cause of new-born deaths. Preterm infants are born with an underdeveloped gastrointestinal (GI) tract, causing intestinal malabsorption. At the first weeks of life, adequate nutrition is critical for brain and...
Coordinated in: Israel
Programme: The European Innovation Council (EIC)
Last update: 29 June 2023

PROJECT

RESOLVE Residual disease assessment in hematologic malignancies to improve patient-relevant outcomes across Europe (RESOLVE)
ID: 101136502
From: 1 April 2024 to: 31 March 2029
"MeMeasurable residual disease (MRD) detected by multiparameter flow cytometry (MFC) has strong prognostic value in patients with the most frequent acute and chronic leukemias, acute myeloid (AML) and chronic lymphocytic leukemia (CLL), but it has not yet been confirmed as a...
Coordinated in: Germany
Programme: Health
Last update: 8 January 2024

PROJECT

LONGITOOLS Dynamic longitudinal exposome trajectories in cardiovascular and metabolic non-communicable diseases
ID: 874739
From: 1 January 2020 to: 30 June 2025
Environmental factors, including air and noise pollution, and the built environment, are typically associated with cardiovascular and metabolic non-communicable diseases (NCDs), e.g. obesity, type 2 diabetes, heart diseases and atherosclerosis. The extent to which these...
Coordinated in: Finland
Programme: SOCIETAL CHALLENGES - Health, demographic change and well-being, Preventing disease
Last update: 19 December 2023

PROJECT

DL-ElastoMark A deep learning-derived, shear wave elastography biomarker for cancer therapy prediction
ID: 101065325
From: 1 September 2023 to: 31 August 2025
The efficacy of standard cancer therapies varies, and while some patients respond to a particular treatment, other patients do not gain any benefit. In response, an era of individualized cancer treatments is emerging which are based on the identification of biomarkers that...
Coordinated in: Cyprus
Programme: Marie Skłodowska-Curie Actions (MSCA)

Last update: 12 September 2022

PROJECT

PandeVITA Pandemic Virus Trace Application for the Effective Knowledge Transfer Between Science and Society Inside the Quadruple Helix Collaboration
ID: 101006316
From: 1 January 2021 to: 31 August 2023
The concept of PandeVITA enables knowledge transfer between society and science inside of the quadruple helix on the European level. With help of the PandeVITA app, the consortium will create and execute an innovative evaluation concept based on different feedback categories...
Coordinated in: Türkiye
Programme: SCIENCE WITH AND FOR SOCIETY
Last update: 28 December 2023

PROJECT

ONCODIR ONCODIR – Evidence-based Participatory Decision Making for Cancer Prevention through implementation research
ID: 101104777
From: 1 June 2023 to: 30 November 2026
Colorectal cancer (CRC) is one of the most common cancer types and its increased occurrence may be attributable to adverse health behaviors, especially in lower socioeconomic status populations. Stemming from the specific risk factors identified with CRC, ONCODIR integrates...
Coordinated in: Greece
Programme: Health
Last update: 24 July 2023

PROJECT

ehcoBUTLER ehcoBUTLER. A global ecosystem for the independent and healty living of elder people with mild cognitive impairments.
ID: 643566
From: 1 January 2015 to: 31 March 2022
The ehcoBUTLER Idea:Nowadays, it is a fact that Europe is ageing. A common characteristic of elders is the frequent occurrence of either physical or mild cognitive impairments. This situation brings new challenges in how to improve the independence and quality of life of...
Coordinated in: Spain
Programme: SOCIETAL CHALLENGES - Health, demographic change and well-being, Health care provision and integrated care
Last update: 23 December 2022

PROJECT

eStandards eHealth Standards and Profiles in Action for Europe and Beyond
ID: 643889
From: 1 May 2015 to: 31 July 2017
The eStandards CSA is proposed by HL7, CEN TC251, & IHE, leading Standards Organizations (SDOs), and is supported by the eHealth Network, ISO TC215, GS1, IHTSDO, IEEE11073, and IMIA to advance eHealth interoperability and global alignment of standards with seven objectives: 1...
Coordinated in: Belgium
Programme: SOCIETAL CHALLENGES - Health, demographic change and well-being, Methods and data
Last update: 4 September 2022

PROJECT

EASY-Diabetes Individualised and Equitable Care of Type 2 Diabetes
ID: 877170
From: 1 November 2019 to: 29 February 2020
EASY – Diabetes is a digital health solution that helps patients with Type 2 diabetes and health care providers analyse dataand make better decisions about therapies by accessing a carefully curated global database based on clinical data andmedical evidence collected over...
Coordinated in: Sweden
Programme: PRIORITY 'Societal challenges, INDUSTRIAL LEADERSHIP - Innovation In SMEs, INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies

Last update: 16 August 2022

PROJECT

ENORASI Virtual Environments for the Training of Visually Impaired
ID: IST-2000-25231
From: 1 January 2001 to: 31 December 2003
The ENORASI project aims at developing a highly interactive and extensible virtual reality system that will allow visually impaired people, especially those blind from birth, to study and interact with various virtual objects. ENORASI will not only introduce techniques for the...
Coordinated in: Greece
Programme: Programme for research, technological development and demonstration on a "User-friendly information society, 1998-2002"
Last update: 13 June 2005

PROJECT

CORESMA COVID-19-Outbreak Response combining E-health, Serolomics, Modelling, Artificial Intelligence and Implementation Research
ID: 101003480
From: 1 April 2020 to: 31 December 2023
Among the biggest challenges in the COVID-19 outbreak are the lack of triangulation of clinical, epidemiologic and immunological information for evidence- based response strategies. Our overriding ambition is to overcome this deficit through field studies and implementation...
Coordinated in: Germany
Programme: SOCIETAL CHALLENGES - Health, demographic change and well-being, Treating and managing disease
Last update: 27 December 2023

PROJECT

GEYEDANCE AI guidance for robot-assisted eye surgery
ID: 101070443
From: 1 September 2022 to: 31 August 2025
"Retina indications are the leading cause of visual impairment in industrialized countries and posing a big unmet socio-economic challenge. Performing surgical actions directly at the retina - one of the most delicate and sensitive areas of the human body - with ultra-thin...
Coordinated in: Austria
Programme: Digital, Industry and Space, Artificial Intelligence and Robotics
Last update: 23 August 2022

PROJECT

Fox-IT Fitting-to-Outcome eXpert for semi-automated cochlear implant fine-tuning
ID: 735134
From: 1 August 2016 to: 30 November 2016
For many deaf patients cochlear implantation has become the standard state-of-the-art care. To achieve optimal hearing performance, cochlear implants need to be adjusted to the individual needs of the user. To date, this has to be done manually by an experienced audiologist...
Coordinated in: Belgium
Programme: SOCIETAL CHALLENGES - Health, demographic change and well-being, Active ageing and self-management of health, INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies - Information and Communication Technologies (ICT), Mainstreaming SME support, especially through a dedicated instrument, Health care provision and integrated care
Last update: 12 August 2022

PROJECT

BrainConquest Boosting Brain-Computer Communication with high Quality User Training
ID: 714567
From: 1 July 2017 to: 31 December 2022
Brain-Computer Interfaces (BCIs) are communication systems that enable users to send commands to computers through brain signals only, by measuring and processing these signals. Making computer control possible without any physical activity, BCIs have promised to revolutionize...
Coordinated in: France

Programme: EXCELLENT SCIENCE - European Research Council (ERC)
Last update: 6 February 2024

PROJECT

CY-BIOBANK Biobanking and the Cyprus Human Genome Project
ID: 857122
From: 1 October 2019 to: 30 September 2026
The genetic investigation of diseases and eHealth are a priority of the Smart Specialization Strategy of Cyprus. The strategy can best be served by creating a Centre of Excellence (CoE) with two pillars: a) A contemporary Biobank research infrastructure that incorporates...
Coordinated in: Cyprus
Programme: Teaming of excellent research institutions and low performing RDI regions
Last update: 15 January 2024

PROJECT

GLOMICAVE Global Omic Data Integration on Animal, Vegetal and Environment Sectors
ID: 952908
From: 1 November 2020 to: 30 April 2024
Massive increases in analytical throughput together with reductions in costs have enabled multi-omics studies to be routinely performed at a scale not previously imagined. Two main barriers hamper our ability to reveal the mechanism behind a specific genotype-phenotype link:...
Coordinated in: Spain
Programme: INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies – Biotechnology
Last update: 28 December 2023

PROJECT

ARCHIMEDES dAta-dRiven integrated approaches to CHemIcal safety assessMEnt and Drug dEvelopment
ID: 101043848
From: 1 September 2022 to: 31 August 2027
Traditional in vivo tesTraditional in vivo tests are hampering the development of new, safe and effective chemicals and drugs. If on one hand we need to ensure that dangerous chemicals do not emerge, on the other, we also need to promote rapid and sustainable innovation to...
Coordinated in: Finland
Programme: European Research Council (ERC)
Last update: 5 April 2023

PROJECT

bAIes Integrative, AI-aided Inference of Protein Structure and Dynamics
ID: 101086685
From: 1 August 2023 to: 31 July 2028
The life sciences community is living in exciting times. During the past year, Artificial Intelligence (AI), and in particular AlphaFold2, has contributed to advancing our understanding of protein behaviour by enabling structure prediction with accuracy comparable to many...
Coordinated in: France
Programme: European Research Council (ERC)
Last update: 13 July 2023

PROJECT

OMICSENS integrated nano-photonic OMICs bio-SENSor for lung cancer
ID: 101129734
From: 1 January 2024 to: 31 December 2026
OMICSENS aims to develop a radically new omics measurement platform that would be initially applied to improve non-small cell lung cancer (NSCLC) prognosis by ensuring a timely and accurate detection of Tyrosine Kinase Inhibitor (TKI) resistance associated to Epidermal Growth...
Coordinated in: Italy
Programme: The European Innovation Council (EIC)
Last update: 14 November 2023

PROJECT

PROJECT

PROJECT

BSPA Bone Surgery Preparation AIde
ID: 837120
From: 1 December 2018 to: 31 May 2019
Healthplus.ai has developed a Proof-of-Concept version (TRL level 3) of an Artificial Intelligence (AI) tool to be offered as a Software as a Service (SaaS) solution and able to automatically and very precisely annotate, segment and 3D visualize unique bone and fracture...
Coordinated in: Netherlands
Programme: PRIORITY 'Societal challenges, INDUSTRIAL LEADERSHIP - Innovation In SMEs, INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies
Last update: 15 August 2022

PROJECT

PhyNeTouch Multiphysics modelling and neural networks synergy to enhance the outcome of robotic catheter ablation for the treatment of atrial fibrillation
ID: 101024463
From: 1 January 2022 to: 31 December 2023
Atrial fibrillation is the most common cardiac arrhythmia affecting more than 7.6 million people in Europe, while future projections estimate a worldwide increase by over 60%. Catheter ablation has evolved over the last decades to an important therapeutic modality for patients...
Coordinated in: United Kingdom
Programme: EXCELLENT SCIENCE - Marie Skłodowska-Curie Actions, Nurturing excellence by means of cross-border and cross-sector mobility
Last update: 28 December 2023

PROJECT
PROJECT

iBack Individualized treatment planning in chronic back pain patients by advanced imaging and multi-parametric biomechanical models
ID: 637164
From: 1 June 2015 to: 30 November 2020
Chronic back pain is a major burden and source of disability worldwide. It is primarily attributed to biomechanical factors. In elderly patients, osteoporosis complicates the biomechanical scenario. Surgery is often required to treat instability-related pain and to restore the...
Coordinated in: Germany
Programme: EXCELLENT SCIENCE - European Research Council (ERC)
Last update: 22 August 2022

PROJECT

UNITE4TB ACADEMIA AND INDUSTRY UNITED INNOVATION AND TREATMENT FOR TUBERCULOSIS
ID: 101007873
From: 1 June 2021 to: 31 May 2028
Current anti-tuberculosis (TB) drug regimens face serious limitations at times of increasing antimicrobial drug resistance. Fortunately, for the first time for centuries, several novel anti-TB compounds are available for clinical evaluation. As the traditional approach to...
Coordinated in: Netherlands
Programme: SOCIETAL CHALLENGES - Health, demographic change and well-being, Innovative Medicines Initiative 2 (IMI2)
Last update: 19 January 2024

PROJECT

EnhancerDesign AI-driven enhancer design for gene therapy
ID: 963884
From: 1 January 2021 to: 30 June 2022
Gene therapy promises to become a durable clinical option for a whole range of diseases, including monogenic hereditary diseases, cancer and neurodegenerative disorders. However, the development of new gene therapy-based treatments strongly depends on regulatory drivers that...
Coordinated in: Belgium
Programme: EXCELLENT SCIENCE - European Research Council (ERC)

Last update: 2 December 2022

PROJECT

ECSTATIC Electrostructural Tomography – Towards Multiparametric Imaging of Cardiac Electrical Disorders
ID: 715093
From: 1 February 2017 to: 31 July 2022
Cardiac electrical diseases are directly responsible for sudden cardiac death, heart failure and stroke. They result from a complex interplay between myocardial electrical activation and structural heterogeneity. Current diagnostic strategy based on separate...
Coordinated in: France
Programme: EXCELLENT SCIENCE - European Research Council (ERC)
Last update: 25 November 2022

PROJECT

MICROBIS Metabolites Inducers of Cross-tolerance to Biotic Stress
ID: 101028809
From: 15 September 2021 to: 14 September 2023
Ensuring food security and accessibility represents a global challenge since world population grows exponentially while crop quality and productivity is restricted by limitations on arable areas and increasing incidence of stress conditions due to climate change. Plant...
Coordinated in: Spain
Programme: EXCELLENT SCIENCE - Marie Skłodowska-Curie Actions, Nurturing excellence by means of cross-border and cross-sector mobility
Last update: 24 August 2022

PROJECT

UNITI Unification of treatments and Interventions for Tinnitus patients
ID: 848261
From: 1 January 2020 to: 30 September 2023
Tinnitus is the perception of a phantom sound and the patient’s reaction to it. Tinnitus remains a scientific and clinical enigma of iTinnitus is the perception of a phantom sound and the patient’s reaction to it. Although much progress has been made, tinnitus remains a...
Coordinated in: Germany
Programme: SOCIETAL CHALLENGES - Health, demographic change and well-being, Understanding health, wellbeing and disease
Last update: 5 February 2024

PROJECT

PROJECT

V-HAB Optimizing Vision reHABilition with virtual-reality games in paediatric amblyopia
ID: 890641
From: 1 March 2021 to: 10 August 2024
To reach for a bottle (motor), we need to be able to identify its properties (attention) and know where in space it is located (3-dimensional (3D) vision). This cascade is however impaired in some developmental disorders of vision, like Paediatric Amblyopia (PA) or lazy eye...
Coordinated in: Switzerland
Programme: EXCELLENT SCIENCE - Marie Skłodowska-Curie Actions, Nurturing excellence by means of cross-border and cross-sector mobility
Last update: 19 December 2023

PROJECT

DeepHealth Deep-Learning and HPC to Boost Biomedical Applications for Health
ID: 825111
From: 1 January 2019 to: 30 June 2022
Health scientific discovery and innovation are expected to quickly move forward under the so called “fourth paradigm of science”, which relies on unifying the traditionally separated and heterogeneous high-performance computing and big data analytics environments. Under...
Coordinated in: Spain
Programme: INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies - Information and Communication Technologies (ICT)
Last update: 11 December 2023

PROJECT

PRIME A Personalised Living Cell Synthetic Computing Circuit for Sensing and Treating Neurodegenerative Disorders

ID: 964712

From: 1 February 2021 to: 31 January 2025

There remain urgent and unmet needs for the treatment of neurological diseases. Epilepsy is a serious, chronic brain disease characterized by recurrent seizures. Closed-loop, implanted devices offer ways to reduce seizures in drug-resistant patients but their efficacy is poor...

Coordinated in: Ireland

Programme: EXCELLENT SCIENCE - Future and Emerging Technologies (FET), FET Open

Last update: 3 March 2023

PROJECT

ERA4TB EUROPEAN REGIMEN ACCELERATOR FOR TUBERCULOSIS

ID: 853989

From: 1 January 2020 to: 31 December 2025

The European Regimen Accelerator for Tuberculosis (ERA4TB) has the explicit goal of developing a new combination therapy to treat all forms of TB starting from ~20 leads and drug candidates provided by EFPIA. Since details of these are as yet unavailable, we will implement an...

Coordinated in: Spain

Programme: SOCIETAL CHALLENGES - Health, demographic change and well-being, Innovative Medicines Initiative 2 (IMI2)

Last update: 24 January 2024

PROJECT

Visual Proteomics Biomarker discovery by AI-guided, image based single-cell isolation proteomics

ID: 846795

From: 1 April 2019 to: 31 March 2021

Early detection of severe malignancies such as cancer is the most effective way to increase patient survival, but early diagnosis and prediction of treatment outcome critically depend on disease-specific biomarkers. However, molecular and cellular disease heterogeneity provide...

Coordinated in: Denmark

Programme: EXCELLENT SCIENCE - Marie Skłodowska-Curie Actions, Nurturing excellence by means of cross-border and cross-sector mobility

Last update: 22 August 2022

PROJE

MITO The function and biomarker potential of mitochondrial microRNAs in hypertension

ID: 893435

From: 3 August 2020 to: 2 August 2022

Hypertension is an extreme public health problem affecting nearly one third of the World’s adult population. Most cardiovascular diseases are provoked by hypertension resulting in an estimated 9.4 million deaths every year. Surprisingly, the diagnosis of hypertension has...

Coordinated in: Luxembourg

Programme: EXCELLENT SCIENCE - Marie Skłodowska-Curie Actions, Nurturing excellence by means of cross-border and cross-sector mobility

Last update: 23 December 2022

PROJECT

IB4SD-TRISTAN Imaging Biomarkers (IBs) for Safer Drugs: Validation of Translational Imaging Methods in Drug Safety Assessment - Sofia ref.: 116106

ID: 116106

From: 1 January 2017 to: 31 December 2024

1.Our consortium has broad, deep experience of drug development and imaging biomarker (IB) validation. We are internationally recognized experts in transporter biology, animal models of lung injury, toxicology, DCEMRI, compartmental modeling, 1H&129Xe lung MR, and labeling of...

Coordinated in: Belgium

Programme: SOCIETAL CHALLENGES - Health, demographic change and well-being, Innovative Medicines Initiative 2 (IMI2)

Last update: 1 February 2024

PROJECT

ThrombUS ThrombUS+: Wearable Continuous Point-of-Care Monitoring, Risk Estimation and Prevention for Deep Vein Thrombosis

ID: 101137227

From: 1 January 2024 to: 30 June 2027

Deep vein thrombosis (DVT) is the formation of a blood clot within the deep veins, most commonly those of the lower limbs, causing obstruction of blood flow. In 50% of people with DVT, the clot eventually breaks off and travels to the lung to cause pulmonary embolism. Clinical...

Coordinated in: Greece

Programme: Health, Tools, Technologies and Digital Solutions for Health and Care, including personalised medicine

Last update: 8 January 2024

PROJECT

MULTIR MULti-Tumour based prediction and manipulation of Immune Response

ID: 101136926

From: 1 January 2024 to: 31 December 2027

Only few patients respond to tumor treatment as desired. Treatment heavily relies on host tumor interactions, including exploiting the host immune response against the tumor. The underlying mechanisms of host tumor interaction are largely unknown, guidance on specific...

Coordinated in: France

Programme: Health

Last update: 8 January 2024

PROJECT

TIQUE InnovaTIve care services, enhanced with technology, to deliver QUick rEsponses for individuals with advanced heart failure and complex care needs through integrated care

ID: 965356

From: 1 March 2021 to: 28 February 2026

Heart failure (HF) is the leading cause of hospitalisation in people over the age of 65 and carries a high cost to healthcare systems. It also exerts a significant economic toll on patients, their families and society in general; more the 15 million people are living with HF...

Coordinated in: Spain

Programme: SOCIETAL CHALLENGES - Health, demographic change and well-being, Health care provision and integrated care

Last update: 24 November 2023

PROJECT

LIGATE LIgand Generator and portable drug discovery platform AT Exascale

ID: 956137

From: 1 January 2021 to: 30 April 2024

Today digital revolution is having a dramatic impact on the pharmaceutical industry and the entire healthcare system. The implementation of machine learning, extreme scale computer simulations, and big data analytics in the drug design and development process offer an...

Coordinated in: Italy

Programme: INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies - Information and Communication Technologies (ICT), Next generation computing: Advanced and secure computing systems and technologies, including cloud computing

Last update: 27 December 2023

PROJECT

OPADE Optimise and predict antidepressant efficacy for patient with major depressive disorders using multi-omics analysis and AI-predictive tool

ID: 101095436

From: 1 December 2022 to: 31 May 2027

280M of people worldwide suffers from major depressive disorders (MDD). Although a well-populated therapeutic landscape of anti-depre280M of people worldwide suffers from major depressive disorders (MDD). Although a well-populated therapeutic landscape of anti-depressants, the...

Coordinated in: Italy

Programme: Health, Tools, Technologies and Digital Solutions for Health and Care, including personalised medicine
Last update: 4 May 2023

PROJECT

BRAV3 Computational biomechanics and bioengineering 3D printing to develop a personalized regenerative biological ventricular assist device to provide lasting functional support to damaged hearts
ID: 874827
From: 1 January 2020 to: 31 December 2024
Ischemic heart disease is the main cause of death in the EU, straining patients and economies. Regenerative Medicine has failed at delivering a definitive solution, and even the breakthrough of cell reprogramming, biomaterials or 3D printing, have not been able to find a...
Coordinated in: Spain
Programme: SOCIETAL CHALLENGES - Health, demographic change and well-being, Treating and managing disease
Last update: 5 February 2024

PROJECT

TransPharm Transforming into a sustainable European pharmaceutical sector
ID: 101057816
From: 1 June 2022 to: 31 May 2026
TransPharm two-track approach focusses on the one hand on the compounds itself by identifying greener and more sustainable-by-design Active Pharmaceutical Ingredients (APIs) and on the other hand reducing the environmental impact and resilience of the manufacturing process by...
Coordinated in: Belgium
Programme: Health, Tools, Technologies and Digital Solutions for Health and Care, including personalised medicine
Last update: 29 July 2022

PROJECT

DRAGON The RapiD and SecuRe AI enhAnced DiaGnosis, Precision Medicine and Patient EmpOwerment Centered Decision Support System for Coronavirus PaNdemics
ID: 101005122
From: 1 October 2020 to: 31 March 2024
In this project, a multinational consortium of high-tech SMEs, academic research institutes, biotech and pharma partners, affiliated patient-centred organisations and professional societies will achieve a multi-faceted diagnostic and prognostic platform and a precision...
Coordinated in: Netherlands
Programme: SOCIETAL CHALLENGES - Health, demographic change and well-being, Innovative Medicines Initiative 2 (IMI2)
Last update: 19 January 2024

PROJECT

PreventIT Early risk detection and prevention in ageing people by self-administered ICT-supported assessment and a behavioural change intervention delivered by use of smartphones and smartwatches
ID: 689238
From: 1 January 2016 to: 31 March 2019
Lifestyle, disease and biology put older people at risk of functional decline, leading to falls, cognitive impairment, frailty, and negative consequences for quality of life. PreventIT will develop and test an ICT based mHealth System (iPAS) for the consumer market that 1)...
Coordinated in: Norway
Programme: SOCIETAL CHALLENGES - Health, demographic change and well-being, Active ageing and self-management of health
Last update: 16 August 2022

PROJECT

LITMUS Liver Investigation: Testing Marker Utility in Steatohepatitis
ID: 777377
From: 1 November 2017 to: 29 February 2024

Strongly associated with the epidemics of obesity and type 2 diabetes that are testing healthcare systems worldwide, Non-Alcoholic Fatty Liver Disease (NAFLD) is an increasingly common cause of advanced liver disease that is characterized by substantial inter-patient...
Coordinated in: United Kingdom
Programme: SOCIETAL CHALLENGES - Health, demographic change and well-being, Innovative Medicines Initiative 2 (IMI2)
Last update: 1 February 2024

PROJECT

COMMUTE COMORBIDITY MECHANISMS UTILIZED IN HEALTHCARE
ID: 101136957
From: 1 December 2023 to: 30 November 2027
The COVID pandemic can be seen as an experiment done with the entirety of humankind (as almost everybody has been or will get infected with SARS-CoV-2). It will therefore have the best coverage over the widest variation possible and is therefore ideally suited to study the...
Coordinated in: Germany
Programme: Health, Non-Communicable and Rare Diseases, Infectious Diseases, including poverty-related and neglected diseases
Last update: 8 January 2024

PROJECT

SynAir-G Disrupting Noxious Synergies of Indoor Air Pollutants and their Impact in Childhood Health and Wellbeing, using Advanced Intelligent Multisensing and Green Interventions
ID: 101057271
From: 1 September 2022 to: 31 August 2026
While the number and types of indoor air pollutants is rising, much is suspected but little is known about the impact of their potentially synergistic interactions, upon human health. Highly susceptible populations include children, allergy and asthma sufferers, and a low...
Coordinated in: Greece
Programme: Health, Environmental and Social Health Determinants
Last update: 23 August 2022

PROJECT

STRATEGY-CKD System omics to unravel the gut-kidney axis in Chronic Kidney Disease.
ID: 860329
From: 1 February 2020 to: 31 July 2024
System omics to unravel the gut-kidney axis in Chronic Kidney Disease:There is a great need for multi-disciplinary and methodologically well trained scientists in order to unravel complex diseases. Chronic kidney disease (CKD), which is more prevalent in women, and its high...
Coordinated in: Belgium
Programme: EXCELLENT SCIENCE - Marie Skłodowska-Curie Actions, Fostering new skills by means of excellent initial training of researchers
Last update: 15 January 2024

PROJECT

Commodity12 COntinuous Multi-parametric and Multi-layered analysis Of DIabetes TYpe 1 & 2
ID: 287841
From: 1 October 2011 to: 30 June 2015
In COMMODITY12 we will build a multi-layered multi-parametric infrastructure for continuous monitoring of diabetes type 1 and 2. The COMMODITY12 system will exploit multi-parametric data to provide healthcare workers and patients, with clinical indicators for the treatment of...
Coordinated in: Germany
Programme: Specific Programme "Cooperation": Information and communication technologies
Last update: 1 August 2019

PROJECT

IntraopRealtimeTumor A Real-time imaging and classification system for low-grade glioma detection during brain surgery
ID: 101066138
From: 1 October 2022 to: 31 March 2024

Brain tumors remain one of the most incurable illnesses we know; patients have poor prognosis and less than a decade of life expectancy. The oncologist’s toolkit is rather limited as chemotherapy agents have limited access to the brain due to the blood brain barrier...

Coordinated in: Israel

Programme: European Research Council (ERC)

Last update: 17 August 2022

PROJECT

ANNEX III:
SUCCESSFUL AI-ENABLED PROJECTS ON SUSTAINABLE ENVIRONMENT AND ENERGY

RESET Restarting the Economy in Support of Environment, through Technology
ID: 101017857
From: 1 January 2021 to: 30 June 2024
Time is running out to achieve a more sustainable development. Post COVID-19 economic stimuli need to deploy a green new deal (GND) that ReSETs economic systems to create secure and meaningful employment whilst protecting nature for people, for climate change and flood...
Coordinated in: United Kingdom
Programme: EXCELLENT SCIENCE - Future and Emerging Technologies (FET), FET Proactive
Last update: 28 December 2023

REPORT SUMMARY

Final Report Summary - UNDERSAFE (Wireless intelligent system for environmental evaluation, safety monitoring and guidance for recreational and Ecotourism underground activities)
Undersafe is a system which will provide constant, round-the-clock monitoring of environmental and other conditions in underground sites open for recreational and tourist purposes. The UnderSafe system is based on wireless technologies. The objective is to...
Project: UNDERSAFE (ID: 286176)
Programme: Specific Programme "Capacities": Research for the benefit of SMEs
Last update: 13 November 2014

Periodic Reporting for period 1 - SAFERS (Structured Approaches for Forest fire Emergencies in Resilient Societies)
Forest fires are exacerbated by extreme weather conditions, which are increasing both in frequency and in magnitude due to climate change. Globally, massive fires have swept through forests and other landscapes in an alarming rate, resulting in the loss of human lives...
Project: SAFERS (ID: 869353)
Programme: Developing comprehensive and sustained global environmental observation and information systems
Last update: 22 September 2022

Final Report Summary - KLEAN (Knowledge-based EFB for green flight trajectory decision aid)
The objective of the KLEAN (Knowledge-based EFB for green flight trajectory decision aid) project has been the development of a custom knowledge-based EFB (Electronic Flight Bag) with SW packages implementing Advanced Weather Radar Post-processor (AWRP) and...
Project: KLEAN (ID: 306927)
Programme: Specific Programme "Cooperation": Joint Technology Initiatives
Last update: 29 December 2015

CROWD4SDG Citizen Science for Monitoring Climate Impacts and Achieving Climate Resilience
ID: 872944
From: 1 May 2020 to: 30 April 2023
The 17 Sustainable Development Goals (SDGs), launched by the UN in 2015, are underpinned by 169 concrete targets and 232 measurable indicators. Some of these indicators have no established measurement methodology. For others, many countries do not have the data collection...
Coordinated in: Switzerland
Programme: Integrate society in science and innovation issues, policies and activities in order to integrate citizens' interests and values and to increase the quality, relevance, social acceptability and sustainability of research and innovation outcomes in various fields of activity from social innovation to areas such as biotechnology and nanotechnology
Last update: 18 December 2023

REPORT SUMMARY

Final Report Summary - SMARTOPENDATA (Linked Open Data for environment protection in Smart Regions)
The SmartOpenData project has completed the creation of a Linked Open Data -LOD- infrastructure extended throughout Europe. This research infrastructure has five different pilots as one of its most visible outcomes. Nevertheless, those tools and applications...
Project: SMARTOPENDATA (ID: 603824)
Programme: Specific Programme "Cooperation": Environment (including Climate Change)
Last update: 2 June 2016

PROJECT

Final ReportSummary - BOVINOSE (Pheromone-based sensor system for detecting estrus in dairy cows)
In order to control the calving interval, and therefore to optimise milk production and maximise offspring in dairy cattle, artificial insemination (AI) is widely used. Currently, the conception rate of AI varies from 30 % to 70 %, and a successful insemination depends mainly ...
Project: BOVINOSE (ID: 232460)
Programme: Specific Programme "Capacities": Research for the benefit of SMEs
Last update: 17 June 2013

PROJECT

Periodic Reporting for period 3 - IntelliAQ (Artificial Intelligence for Air Quality)
Status 31 May 2021Artificial Intelligence (AI) is experiencing a wave of enthusiasm, since ground-breaking results have been published on cognitive problems such as image and speech recognition, automated language translation, robotics, and strategic games. This has become...
Project: IntelliAQ (ID: 787576)
Programme: EXCELLENT SCIENCE - European Research Council (ERC)
Last update: 30 June 2023

GECKO building GrEener and more sustainable soCieties by filling the Knowledge gap in social science and engineering to enable responsible artificial intelligence co-creatiOn
ID: 955422
From: 1 January 2021 to: 31 December 2024
GECKO will focus on accountable, responsible, and transparent artificial intelligence (ART AI) to address urgent environmental needs and support the European Green Deal and AI ecosystem, ensuring that all citizens benefit from the sustainable green transition. The EC AI...
Coordinated in: Germany
Programme: EXCELLENT SCIENCE - Marie Skłodowska-Curie Actions, Fostering new skills by means of excellent initial training of researchers
Last update: 29 January 2024

PROJECT

ANTARES Centre of Excellence for Advanced Technologies in Sustainable Agriculture and Food Security
ID: 739570
From: 1 March 2017 to: 28 February 2025
Agriculture is facing enormous challenges today. Not only does it have to provide enough safe and healthy food for the ever-increasing Earth’s population, it is also expected to offer alternatives to fossil fuels and to protect the non-renewable resources such as soil, water...
Coordinated in: Serbia
Programme: Teaming of excellent research institutions and low performing RDI regions
Last update: 30 June 2023

NARSIS New Approach to Reactor Safety ImprovementS
ID: 755439
From: 1 September 2017 to: 28 February 2022
Probabilistic Safety Assessment (PSA) procedures allow to better understand and estimate the likelihood of the most causes prone to initiate nuclear accidents and to identify the most critical elements of the systems. However, despite of the remarkable reliability of current...
Coordinated in: France
Programme: Euratom, Support safe operation of nuclear systems
Last update: 6 February 2024

ACHIEF Innovative high performance Alloys and Coatings for HIghly EFficient intensive energy processes

ID: 958374
From: 1 October 2020 to: 31 March 2024
The ACHIEF project will develop novel efficient materials-based solutions enabling to meet extreme and fluctuating conditions currently employed in Energy Intensive Industries (EII) through the utilization of an Artificial Intelligent combined Modelling approach for the design...
Coordinated in: France
Programme: Sustainable, resource-efficient and low-carbon technologies in energy-intensive process industries, INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies - Advanced manufacturing and processing
Last update: 5 February 2024

TWAIN Integrated, Value-based and Multi-objective wind farm control powered by Artificial Intelligence
ID: 101122194
From: 1 November 2023 to: 31 October 2027
For reliable and affordable design and operation of wind power plants that also consider system-level stability and security as well as the surrounding natural and social environment, coordinated wind farm control (WFC) and asset management solutions play an important role...
Coordinated in: Denmark
Programme: Energy Supply, Climate, Energy and Mobility
Last update: 8 September 2023

Smart_FDP Smart Digital Solution for Field Development Planning Optimization
ID: 101111369
From: 1 September 2023 to: 31 August 2025
To meet the world's energy demands specifically with “easy oil” reservoirs depleting, it is important to optimize production and field development planning (FDP). This will be even more pronounced in the years to come if pore space is to be used to store CO2 or hydrogen in...
Coordinated in: Norway
Programme: Marie Skłodowska-Curie Actions (MSCA)
Last update: 25 July 2023

PROJECT

NEXOGENESIS Facilitating the next generation of effective and intelligent water-related policies utilising artificial intelligence and reinforcement learning to assess the water-energy-food-ecosystem (WEFE) nexus
ID: 101003881
From: 1 September 2021 to: 31 August 2025
Water, energy, food, and ecosystems (WEFE) are interconnected, comprising a coherent system (nexus) dominated by complexity and modulated by climatic and socio-economic drivers. Resource constraints, and their interconnectedness could hamper economic development, including...
Coordinated in: Netherlands
Programme: SOCIETAL CHALLENGES - Climate action, Environment, Resource Efficiency and Raw Materials, Fighting and adapting to climate change, Protection of the environment, sustainable management of natural resources, water, biodiversity and ecosystems
Last update: 30 January 2024

PROJECT

AHEAD TowArd sustainable foresigHt capabilitiEs for increAseD Civil Security
ID: 101121338
From: 1 September 2023 to: 28 February 2026
With the rise of potentially disruptive technologies such as artificial intelligence and virtual reality, a particular challenge has emerged for LEAs and other civil security practitioners. Tasked with fostering safe societies and protecting European citizens from new forms...
Coordinated in: France
Programme: Disaster-Resilient Societies, Protection and Security, Civil Security for Society
Last update: 22 September 2023

PROJECT

FEROX Fostering and Enabling AI, Data and Robotics Technologies for Supporting Human Workers in Harvesting Wild Food
ID: 101070440
From: 1 September 2022 to: 31 August 2025

Wild berries and mushrooms are considered to be a national treasure of Nordic countries. These food products require zero resources to cultivate as they grow naturally in the forests. It is estimated that less than 10% of the total annual wild berry crop is harvested from the...
Coordinated in: Italy
Programme: Digital, Industry and Space, Artificial Intelligence and Robotics
Last update: 23 August 2022

SMART5GRID Smart5Grid - Demonstration of 5G solutions for SMART energy GRIDs of the future
ID: 101016912
From: 1 January 2021 to: 30 April 2024
5G is envisioned to be the first global technology standard that will address the variety of future use cases of the energy sector, by ensuring that both the radio and core network performance requirements can be met in terms of end-to-end latency, reliability and...
Coordinated in: Italy
Programme: INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies - Information and Communication Technologies (ICT)
Last update: 5 February 2024

PROJECT

BioDT Biodiversity Digital Twin for Advanced Modelling, Simulation and Prediction Capabilities
ID: 101057437
From: 1 June 2022 to: 31 May 2025
With our planet facing an increasing reduction in biodiversity, it is of the utmost importance to understand the way climate, humans, pollution and other factors affect biodiversity. This need is urgent since biodiversity loss directly impacts our ability as humans to live...
Coordinated in: Finland
Programme: Research infrastructures, The innovation potential of European Research Infrastructures and activities for Innovation and Training
Last update: 4 May 2023

PROJECT

HiDALGO HPC and Big Data Technologies for Global Systems
ID: 824115
From: 1 December 2018 to: 28 February 2022
Developing evidence and understanding concerning Global Challenges and their underlying parameters is rapidly becoming a vital challenge for modern societies. Various examples, such as health care, the transition of green technologies or the evolution of the global climate up...
Coordinated in: Spain
Programme: Development, deployment and operation of ICT-based e-infrastructures, EXCELLENT SCIENCE - Research Infrastructures
Last update: 7 September 2023

BIM-SPEED Harmonised Building Information Speedway for Energy-Efficient Renovation
ID: 820553
From: 1 November 2018 to: 31 October 2022
‘BIM for renovation of existing residential building stock’ has been proven viable in innovative pilot projects by the members of BIM-SPEED consortium, among others in H2020 Smart Cities. The mission of BIM-SPEED is to take ‘BIM for renovation’ to a deep renovation...
Coordinated in: Germany
Programme: Technologies enabling energy-efficient systems and energy-efficient buildings with a low environmental impact, INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies - Advanced manufacturing and processing
Last update: 30 November 2023

PROJECT

NEANIAS Novel EOSC services for Emerging Atmosphere, Underwater and Space Challenges
ID: 863448
From: 1 November 2019 to: 31 October 2022
NEANIAS is an ambitious project that comprehensively addresses the ‘Prototyping New Innovative Services’ challenge set out in the recent ‘Roadmap for EOSC’ foreseen actions. NEANIAS will drive the co-design, delivery, and integration into EOSC of innovative thematic...

Coordinated in: Greece
Programme: Development, deployment and operation of ICT-based e-infrastructures, EXCELLENT SCIENCE - Research Infrastructures
Last update: 18 January 2024

PROJECT

INTCATCH Development and application of Novel, Integrated Tools for monitoring and managing Catchments
ID: 689341
From: 1 June 2016 to: 31 January 2020
INTCATCH will instigate a paradigm shift in the monitoring and management of surface water quality that is fit for global waters in the period 2020-2050. INTCATCH will do this by developing efficient, user-friendly water monitoring strategies and systems based on innovative...
Coordinated in: United Kingdom
Programme: SOCIETAL CHALLENGES - Climate action, Environment, Resource Efficiency and Raw Materials, Enabling the transition towards a green economy and society through eco-innovation
Last update: 17 August 2022

PROJECT

RELIANCE REsearch LIfecycle mAnagemeNt for Earth Science Communities and CopErnicus users in EOSC
ID: 101017501
From: 1 January 2021 to: 30 June 2023
RELIANCE will extend the EOSC service offering with a set of industry-strong, innovative, interconnected services for the open, efficient, and cross-disciplinary management of the research lifecycle. In accordance with FAIR and Open Science principles, it will adopt a holistic...
Coordinated in: Poland
Programme: Development, deployment and operation of ICT-based e-infrastructures, EXCELLENT SCIENCE - Research Infrastructures
Last update: 30 January 2024

PROJECT

sustAGE Smart environments for person-centered sustainable work and well-being
ID: 826506
From: 1 January 2019 to: 30 June 2022
"sustAGE aims to develop a person-centered solution for promoting the concept of ""sustainable work"" for EU industries. The project provides a paradigm shift in human machine interaction, building upon seven strategic technology trends, IoT, Machine learning, micro-moments...
Coordinated in: Greece
Programme: SOCIETAL CHALLENGES - Health, demographic change and well-being, Active ageing, independent and assisted living, Individual awareness and empowerment for self-management of health
Last update: 28 December 2022

Water-Futures Smart Water Futures: designing the next generation of urban drinking water systems
ID: 951424
From: 1 August 2021 to: 31 July 2027
The world population living in urban settlements is expected to increase to 70% of 9.7 billion by 2050. Historically, as cities grew, new water infrastructures followed as needed. However, these developments had less to do with real planning than with reacting to crisis...
Coordinated in: Cyprus
Programme: EXCELLENT SCIENCE - European Research Council (ERC)
Last update: 30 January 2024

PROJECT

SHIP2FAIR Solar Heat for Industrial Process towards Food and Agro Industries Commitment in Renewables
ID: 792276
From: 1 April 2018 to: 30 June 2023
SHIP2FAIR aims to foster the integration of solar heat in industrial processes (SHIP) from the agro–food sector, by developing and demonstrating a set of tools and methods for the development of industrial solar heat projects during its whole life-cycle.Thus, the project...
Coordinated in: Spain
Programme: SOCIETAL CHALLENGES - Secure, clean and efficient energy, Low-cost, low-carbon energy supply

Last update: 1 February 2024

BioMedaqu Aquaculture meets Biomedicine: Innovation in Skeletal Health research.
ID: 766347
From: 1 August 2018 to: 31 January 2023
Skeletal anomalies in farmed fish are a continuous problem for global aquaculture, affecting fish welfare, performance, and product quality. Aquaculture research has made considerable progress in reducing the incidence of deformities, but new species, intensified production...
Coordinated in: Belgium
Programme: EXCELLENT SCIENCE - Marie Skłodowska-Curie Actions, Fostering new skills by means of excellent initial training of researchers
Last update: 1 February 2024

PROJECT

CHARTER Drivers and Feedbacks of Changes in Arctic Terrestrial Biodiversity
ID: 869471
From: 1 August 2020 to: 31 January 2025
CHARTER aims to advance state-of-the-art (SOTA) knowledge on Arctic biodiversity change and social-ecological systems (SES) on four critical fronts: i) Feedbacks: To understand transitions in vegetation cover, energy balance and cryospheric change at centennial, decadal, and...
Coordinated in: Finland
Programme: SOCIETAL CHALLENGES - Climate action, Environment, Resource Efficiency and Raw Materials, Fighting and adapting to climate change
Last update: 19 January 2024

DRAGON Data Driven Precision Agriculture Services and Skill Acquisition
ID: 810775
From: 1 October 2018 to: 31 January 2022
"Precision Agriculture (PA) is an evolving farming management strategy using digital technologies & techniques to monitor and optimise agricultural production processes. PA methods, harnessing data streams from satellites, mobile phones, Internet of Things (IoT) and...
Coordinated in: Serbia
Programme: Twinning of research institutions
Last update: 11 October 2022

Tech4Biowaste A dynamic database of relevant technologies of bio-waste utilisation
ID: 101023200
From: 1 April 2021 to: 31 March 2023
"Bio-waste is a key waste stream in Europe with a high potential for contributing to a more circular economy. The Tech4Biowaste project will pave the way for deployment of bio-waste technologies and technology configurations by setting-up a database providing a comprehensive...
Coordinated in: Netherlands
Programme: INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies – Biotechnology, SOCIETAL CHALLENGES - Food security, sustainable agriculture and forestry, marine, maritime and inland water research, and the bioeconomy, Bio-based Industries Joint Technology Initiative (BBI-JTI)
Last update: 14 November 2023

FLEXGRID A novel smart grid architecture that facilitates high RES penetration through innovative markets towards efficient interaction between advanced electricity grid management and intelligent stakeholders
ID: 863876
From: 1 October 2019 to: 30 September 2022
Future smart grids require the effective interaction between energy markets and electricity grid management systems in order to introduce new services and mitigate risks introduced by high RES penetration. FLEXGRID envisages the orchestration and integration of: i) advanced...
Coordinated in: Greece
Programme: SOCIETAL CHALLENGES - Secure, clean and efficient energy, A single, smart European electricity grid
Last update: 7 May 2023

EXCITE2 Enhanced X(cross)-disciplinary Community-driven Imaging Technologies for Earth and Environmental material research

ID: 101131765

From: 1 April 2024 to: 31 March 2028

The EXCITE² Network is revolutionizing Earth and environmental material science research by consolidating a critical mass of 18 research facilities in 12 European and associated partner countries into a unified infrastructure and providing transnational access to advanced...

Coordinated in: Netherlands

Programme: Research infrastructures, Opening, Integrating and Interconnecting Research Infrastructures

Last update: 3 November 2023

PROJECT

DT-GEO A Digital Twin for GEOphysical extremes

ID: 101058129

From: 1 September 2022 to: 31 August 2025

With present computational capabilities and data volumes entering the Exascale Era, digital twins of the Earth system will be able to mimic the different system components (atmosphere, ocean, land, lithosphere) with unrivaled precision, providing analyses, forecasts, and what...

Coordinated in: Spain

Programme: Research infrastructures, The innovation potential of European Research Infrastructures and activities for Innovation and Training

Last update: 14 September 2022

PROJECT

LEWIS Landslide early-warning integrated system

ID: EVG1-CT-2001-00055

From: 1 March 2002 to: 31 August 2005

The LEWIS project develops a new integrated Earth Observation (EO) approach for producing landslide-warning maps. It first uses the analysis of historical multi-source satellite data for the detection of surface feature changes related to causative and triggering mechanisms th...

Coordinated in: Italy

Programme: Programme for research, technological development and demonstration on "Energy, environment and sustainable development, 1998-2002"

Last update: 9 December 2005

PLASCAT Plasma-assisted catalysis for the removal of volatile organic compounds from waste gas stream

ID: 7801

From: 1 October 2005 to: 30 September 2007

The purpose of this project is to investigate the effectiveness of the novel hybrid technology of plasma-assisted catalysis as a means for environmental clean-up of polluted, waste gaseous emissions and to gain a fundamental understanding of the synergistic effects that result...

Coordinated in: United Kingdom

Programme: Human resources and Mobility in the specific programme for research, technological development and demonstration "Structuring the European Research Area" under the Sixth Framework Programme 2002-2006

Last update: 10 March 2023

NanoSolveIT Innovative Nanoinformatics models and tools: towards a Solid, verified and Integrated Approach to Predictive (eco)Toxicology (NanoSolveIT)

ID: 814572

From: 1 January 2019 to: 31 August 2023

NanoSolveIT will introduce a ground-breaking in silico Integrated Approach to Testing and Assessment (IATA) for the environmental health and safety of Nanomaterials (NM), implemented as a decision support system packaged as a standalone open software and a Cloud platform...

Coordinated in: Cyprus

Programme: INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies - Advanced materials, INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies – Nanotechnologies

Last update: 14 November 2023

REXUS MANAGING RESILIENT NEXUS SYSTEMS THROUGH PARTICIPATORY SYSTEMS DYNAMICS MODELLING

ID: 101003632
From: 1 May 2021 to: 30 April 2024
REXUS ambitious goal is to bring transformative change in the way our societies approach the Water Food Energy Climate Nexus. The project argues that this is possible only through the activation of inclusive nexus partnerships, the Learning & Action Alliances (LAAs). The...
Coordinated in: Spain
Programme: SOCIETAL CHALLENGES - Climate action, Environment, Resource Efficiency and Raw Materials, Fighting and adapting to climate change, Protection of the environment, sustainable management of natural resources, water, biodiversity and ecosystems
Last update: 27 December 2023

PROJECT

RISE Real-time Earthquake Risk Reduction for a Resilient Europe
ID: 821115
From: 1 September 2019 to: 31 May 2023
The key concept and vision of RISE is to promote a paradigm shift in how earthquake risk is perceived and managed. We believe that by taking advantage of advances in scientific understanding, and dramatically changing technological capabilities, earthquake hazard and risk will...
Coordinated in: Switzerland
Programme: Provide knowledge and tools for effective decision making and public engagement, SOCIETAL CHALLENGES - Climate action, Environment, Resource Efficiency and Raw Materials
Last update: 1 February 2024

INSHIP Integrating National Research Agendas on Solar Heat for Industrial Processes
ID: 731287
From: 1 January 2017 to: 31 December 2020
Despite process heat is recognized as the application with highest potential among solar heating and cooling applications, Solar Heat for Industrial Processes (SHIP) still presents a modest share of about 0.3% of total installed solar thermal capacity. As of today's...
Coordinated in: Germany
Programme: SOCIETAL CHALLENGES - Secure, clean and efficient energy, New knowledge and technologies, Low-cost, low-carbon energy supply, Alternative fuels and mobile energy sources, A single, smart European electricity grid
Last update: 23 August 2022

MANGO MANGO: exploring Manycore Architectures for Next-GeneratiOn HPC systems
ID: 671668
From: 1 October 2015 to: 31 March 2019
MANGO targets to achieve extreme resource efficiency in future QoS-sensitive HPC through ambitious cross-boundary architecture exploration for performance/power/predictability (PPP) based on the definition of new-generation high-performance, power-efficient, heterogeneous...
Coordinated in: Spain
Programme: EXCELLENT SCIENCE - Future and Emerging Technologies (FET), FET Proactive
Last update: 7 September 2023

SCORPION Cost effective robots for smart precision spraying
ID: 101004085
From: 1 January 2021 to: 31 December 2023
Spraying in agriculture represents a societal challenge due to its negative impact in human and animal health and in environment. Increasing spraying efficiency towards the objective of "right time, right amount, right place", involves reduction of losses and...
Coordinated in: Portugal
Programme: INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies – Space, Enabling exploitation of space data
Last update: 15 January 2024

PROJECT

STORM Self-organising Thermal Operational Resource Management
ID: 649743

From: 1 March 2015 to: 31 March 2019
In STORM a generic district heating and cooling (DHC) network controller will be development and demonstration, with the ambition to increase the use of waste heat and renewable energy sources in the DHC network.The general applicability will be guaranteed by the following...
Coordinated in: Belgium
Programme: SOCIETAL CHALLENGES - Secure, clean and efficient energy, Reducing energy consumption and carbon foorpint by smart and sustainable use
Last update: 15 August 2022

YADES Improved Resilience and Sustainable Reconstruction of Cultural Heritage Areas to cope with Climate Change and Other Hazards based on Innovative Algorithms and Modelling Tools
ID: 872931
From: 1 April 2020 to: 31 March 2025
YADES aims to efficiently train a network of fellows on the field of the resilience of Cultural Heritage (CH) areas and historic cities against Climate Change (CC) and other types of hazards. Towards this direction, YADES aims to introduce a research framework for downscaling...
Coordinated in: Greece
Programme: EXCELLENT SCIENCE - Marie Skłodowska-Curie Actions, Stimulating innovation by means of cross-fertilisation of knowledge
Last update: 5 February 2024

TURNkey Towards more Earthquake-resilient Urban Societies through a Multi-sensor-based Information System enabling Earthquake Forecasting, Early Warning and Rapid Response actions
ID: 821046
From: 1 June 2019 to: 31 May 2022
TURNkey aims to make significant advances in the fields of Operational Earthquake Forecasting (OEF), Earthquake Early Warning (EEW) and the Rapid Response to Earthquakes (RRE), particularly when applying these systems in practice in Europe. The project will develop a flexible...
Coordinated in: Norway
Programme: Provide knowledge and tools for effective decision making and public engagement, SOCIETAL CHALLENGES - Climate action, Environment, Resource Efficiency and Raw Materials
Last update: 9 December 2022

PROJECT

SABER CULTURAL SAfeguarding Biodiversity and Ecosystem seRvices by integrating CULTURAL values in freshwater management: learning from Māori
ID: 748625
From: 1 January 2018 to: 31 December 2020
Freshwater ecosystems are essential to people´s economic, cultural and social wellbeing, yet are still one of the most seriously threatened ecosystems on the planet. This conflict is reflected in political regulations that ask to halt the loss of, restore and safeguard...
Coordinated in: Spain
Programme: EXCELLENT SCIENCE - Marie Skłodowska-Curie Actions, Nurturing excellence by means of cross-border and cross-sector mobility
Last update: 28 August 2022

PROJECT

CoEvolFramework Unified Framework for the Analysis of Co-evolutionary Systems
ID: 657027
From: 1 February 2016 to: 31 January 2018
Today's challenges are marked by more frequent and wide-spread episodes of social, economic, political and environmental crisis. Co-evolutionary systems offer a natural perspective and powerful tools to help us understand conditions that affect populations of agents whose...
Coordinated in: United Kingdom
Programme: EXCELLENT SCIENCE - Marie Skłodowska-Curie Actions, Nurturing excellence by means of cross-border and cross-sector mobility
Last update: 8 August 2022

PROJECT

DCNextEve LV DC microgrids for evolved energy communities
ID: 708844
From: 1 July 2016 to: 15 October 2018
Microgrids are an important concept in the emerging power industry field. They are widely recognized as an innovative eco-system when it comes to a flexible and reliable option for the integration of distributed energy renewable resources (DER). The research on direct current...
Coordinated in: Romania
Programme: EXCELLENT SCIENCE - Marie Skłodowska-Curie Actions, Nurturing excellence by means of cross-border and cross-sector mobility
Last update: 9 August 2022

PROJECT

SAFE4ALL Safeguarding African Foodsheds and Ecosystems for all Actors across Local, regional and international Levels to manage migration
ID: 101137814
From: 1 January 2024 to: 31 December 2027
Agriculture is the foundation of the livelihoods of billions of people worldwide, including African rural and urban households, farming communities, and cities. However, weather and climate risks have increased, creating a need for better access to climate and weather...
Coordinated in: Netherlands
Programme: Climate, Energy and Mobility, Climate Science and Solutions
Last update: 11 December 2023

Advancing satellite data integration for improved earth observation outcomes
Project: CALLISTO (ID: 101004152)
Programme: INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies – Space
Available languages:
DEENESFRITPL
Last update: 10 May 2021

Final Report Summary - FOODINTEGRITY (Ensuring the Integrity of the European food chain)
FoodIntegrity is a 5 year, interdisciplinary project funded under Framework 7, that aimed to assure the integrity of our food. The project comprised 60 participants from EU Member States, China and Argentina. FoodIntegrity was commissioned in 2014 against the background of...
Project: FOODINTEGRITY (ID: 613688)
Programme: Specific Programme "Cooperation": Food, Agriculture and Biotechnology
Last update: 3 July 2019

PROJECT

CROWD4SDG Citizen Science for Monitoring Climate Impacts and Achieving Climate Resilience
ID: 872944
From: 1 May 2020 to: 30 April 2023
The 17 Sustainable Development Goals (SDGs), launched by the UN in 2015, are underpinned by 169 concrete targets and 232 measurable indicators. Some of these indicators have no established measurement methodology. For others, many countries do not have the data collection...
Coordinated in: Switzerland
Programme: Integrate society in science and innovation issues, policies and activities in order to integrate citizens' interests and values and to increase the quality, relevance, social acceptability and sustainability of research and innovation outcomes in various fields of activity from social innovation to areas such as biotechnology and nanotechnology
Last update: 18 December 2023

Final Report Summary - SODSAT (Remote precision management of turf grass sod production by means of artificial intelligence and satellite imaging)
Sod or Turf Grass as it is more commonly known, is used extensively in sports and landscaping projects. Although natural sod has been replaced with synthetic turf in some cases, turf grass still is still the choice for many sports and landscaping projects. Just like any...
Project: SODSAT (ID: 605729)
Programme: Specific Programme "Capacities": Research for the benefit of SMEs
Last update: 12 August 2016

PROJECT

ADAPT Adaptive Decision support for Agents negotiation in electricity market and smart grid Power Transactions
ID: 703689
From: 1 January 2017 to: 31 December 2018
ADAPT explores the theme of decision support for agents negotiations in the complementary environments of electricity markets and smart grids. The EU priority of increasing the penetration of renewable energy sources in the power system has led to the wide acceptance of the...
Coordinated in: Spain
Programme: EXCELLENT SCIENCE - Marie Skłodowska-Curie Actions, Nurturing excellence by means of cross-border and cross-sector mobility
Last update: 11 August 2022

Final Report Summary - CROPS (Intelligent sensing and manipulation for sustainable production and harvesting of high value crops, clever robots for crops)
The following results were obtained in the CROPS project. For the robotic middleware ROS was chosen as software framework. The supervisory control system as well as the high-level software architecture have been developed and tested.The design and...
Project: CROPS (ID: 246252)
Programme: Specific Programme "Cooperation": Nanosciences, Nanotechnologies, Materials and new Production Technologies
Last update: 29 December 2015

Periodic Reporting for period 1 - EnergySequence (Building data scientist to help us dive deep into the very large amount structured time series data pertaining to building energy use)
Nearly 40% of final energy consumption and 36% of greenhouse gas emissions are produced by buildings. The actual process of improving building energy efficiency is time-consuming and cost intensive. Energy experts spend a lot of time walking around buildings, collecting...
Project: EnergySequence (ID: 739834)
Programme: INDUSTRIAL LEADERSHIP - Innovation In SMEs
Last update: 26 February 2021

REPORT SUMMARY

SYNTHESYS PLUS Synthesis of systematic resources
ID: 823827
From: 1 February 2019 to: 31 July 2023
European natural history collections are a critical infrastructure for meeting the most important challenge humans face over the next 30 years – mapping a sustainable future for ourselves and the natural systems on which we depend – and for answering fundamental scientific...
Coordinated in: United Kingdom
Programme: Integrating and opening existing national and regional research infrastructures of European interest, EXCELLENT SCIENCE - Research Infrastructures
Last update: 1 February 2024

ACTION Participatory science toolkit against pollution
ID: 824603
From: 1 February 2019 to: 31 January 2022
ACTION will transform the way we do citizen science (CS) today: from a mostly scientist-led process to a more participatory, inclusive, citizen-led one, which acknowledges the diversity of the CS landscape and of the challenges CS teams have to meet as their project evolves...
Coordinated in: United Kingdom
Programme: Integrate society in science and innovation issues, policies and activities in order to integrate citizens' interests and values and to increase the quality, relevance, social acceptability and sustainability of research and innovation outcomes in various fields of activity from social innovation to areas such as biotechnology and nanotechnology
Last update: 7 October 2022

HEROES Hybrid Eco Responsible Optimized European Solution
ID: 956874

From: 1 March 2021 to: 28 February 2023
Bridging the gap between HPC and IA/ML user communities and HPC Resources is key to unleash Europe's innovation potential. A lot of effort is done to build the European technologies able to deliver centralised, petascale/exascale HPC & ML. It is equally important to make...
Coordinated in: France
Programme: INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies - Information and Communication Technologies (ICT), Next generation computing: Advanced and secure computing systems and technologies, including cloud computing
Last update: 16 September 2022

PROJECT

ReTraCE Realising the Transition to the Circular Economy: Models, Methods and Applications
ID: 814247
From: 1 November 2018 to: 30 April 2023
This network brings together an exceptionally strong team of world-leading experts from a wide set of beneficiaries and partners in order to achieve breakthroughs in understanding how the transition towards a Circular Economy (CE) can be realised in a successful way in the...
Coordinated in: United Kingdom
Programme: EXCELLENT SCIENCE - Marie Skłodowska-Curie Actions, Fostering new skills by means of excellent initial training of researchers
Last update: 30 November 2023

PROJECT

ARAGORN Adaptive Reconfigurable Access and Generic interfaces for Optimisation in Radio Networks
ID: 216856
From: 1 January 2008 to: 30 August 2010
The primary aim of the ARAGORN project is to research and develop a Cognitive Resource Manager (CRM) that aims to ensure that efficient use is made of both node-local and shared resources in a collaborative wireless system. These include, for example, local energy consumption...
Coordinated in: Germany
Programme: Specific Programme "Cooperation": Information and communication technologies
Last update: 16 July 2019

PROVIDE Paris Agreement Overshooting – Reversibility, Climate Impacts and Adaptation Needs
ID: 101003687
From: 1 September 2021 to: 31 August 2024
Overshooting the Paris Agreement temperature thresholds is a distinct possibility. The impacts of such overshoot scenarios would materialise globally, but be particularly consequential for vulnerable regions and systems for which thresholds of abrupt and possibly irreversible...
Coordinated in: Germany
Programme: SOCIETAL CHALLENGES - Climate action, Environment, Resource Efficiency and Raw Materials, Fighting and adapting to climate change
Last update: 24 January 2024

PROJECT

SecureGas Securing The European Gas Network
ID: 833017
From: 1 June 2019 to: 30 November 2021
SecureGas focuses on the 140.000Km of the European Gas network covering the entire value chain from Production to Distribution to the users, providing methodologies, tools and guidelines to secure existing and incoming installations and make them resilient to cyber-physical...
Coordinated in: Italy
Programme: Improve cyber security, Secure societies - Protecting freedom and security of Europe and its citizens, Protect and improve the resilience of critical infrastructures, supply chains and tranport modes
Last update: 29 July 2022

IPM Decisions Stepping-up IPM decision support for crop protection
ID: 817617

From: 1 June 2019 to: 31 May 2024
The ‘IPM Decisions’ project proposed here will accelerate impact from farm Decision Support Systems (DSS) for IPM, as advocated in the Sustainable Use Directive. The impact of DSS in crop protection has been constrained by regional and sectoral fragmentation of actors...
Coordinated in: United Kingdom
Programme: Increasing production efficiency and coping with climate change, while ensuring sustainability and resilience, SOCIETAL CHALLENGES - Food security, sustainable agriculture and forestry, marine, maritime and inland water research, and the bioeconomy
Last update: 19 December 2023

PROJECT

TEMA Trusted Extremely Precise Mapping and Prediction for Emergency Management
ID: 101093003
From: 1 December 2022 to: 30 November 2026
TEMA will greatly improve Natural Disaster Management (NDM, e.g., for wildfires, floods) by automating precise semantic 3D mapping and disaster evolution prediction to achieve NDM goals in near-real-time. It will analyze and fuse many heterogeneous extreme data sources: smart...
Coordinated in: Greece
Programme: Digital, Industry and Space, Advanced Computing and Big Data
Last update: 10 March 2023

ADMIRAL Advanced multimodal marketplace for low emission and energy transportation
ID: 101104163
From: 1 May 2023 to: 30 April 2026
Freight transportation is responsible for large share of total GHG emissions in Europe. So far, majority of companies have concentrated on their primary emissions and those caused by their energy use, while indirect emissions from e.g. logistics services have received limited...
Coordinated in: Finland
Programme: Clean, Safe and Accessible Transport and Mobility, Climate, Energy and Mobility, Smart Mobility
Last update: 13 July 2023

PROJECT

Morse Model-based optimisation for efficient use of resources and energy
ID: 768652
From: 1 October 2017 to: 28 February 2022
The process industry is continuously looking for new ways to improve resource efficiency due to high dependence on resources (energy, raw materials and utilities). In large scale production even small changes in using raw materials and in energy can significantly improve...
Coordinated in: Finland
Programme: Sustainable, resource-efficient and low-carbon technologies in energy-intensive process industries, INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies - Advanced manufacturing and processing
Last update: 9 November 2022

PROJECT

NATALIE Accelerating and mainstreaming transformative NATure-bAsed solutions to enhance resiLIEence to climate change for diverse bio-geographical European regions
ID: 101112859
From: 1 September 2023 to: 31 August 2028
NATALIE addresses the risks posed by climate change and its impacts and proposes to advance the concepts of “ecosystem-based adaptation” in Europe combined with climate resilient development pathways, as the means for impact driven Nature-Based Solutions (NBS), to...
Coordinated in: France
Programme: Culture, creativity and inclusive society, Digital, Industry and Space, Civil Security for Society, Climate, Energy and Mobility, Food, Bioeconomy Natural Resources, Agriculture and Environment
Last update: 5 June 2023

SALSA Small farms, small food businesses and sustainable food security

ID: 677363
From: 1 April 2016 to: 31 July 2020
SALSA will assess the role of small farms and small food businesses in delivering a sustainable and secure supply of affordable, nutritious and culturally adequate food. SALSA will identify the mechanisms which, at different scales, can strengthen the role of small farms in...
Coordinated in: Portugal
Programme: SOCIETAL CHALLENGES - Food security, sustainable agriculture and forestry, marine, maritime and inland water research, and the bioeconomy
Last update: 22 August 2022

DiverSea INTEGRATED OBSERVATION, MONITORING AND PREDICTION ARCHITECTURE FOR FUNCTIONAL BIODIVERSITY OF COASTAL SEAS
ID: 101082004
From: 1 September 2023 to: 31 August 2027
DiverSea develops novel marine observation and monitoring technology by combining: 1a) The new DNA-based identification approach “DNA-marks”: This approach will harnesses low coverage/cost genomic data to document genetic diversity and discriminate beyond species, to the...
Coordinated in: Norway
Programme: Seas, Oceans and Inland Waters, Food, Bioeconomy Natural Resources, Agriculture and Environment
Last update: 28 August 2023

PROJECT

BigDataGrapes Big Data to Enable Global Disruption of the Grapevine-powered Industries
ID: 780751
From: 1 January 2018 to: 31 December 2020
Big data is becoming a hype that is going to completely redefine industries within very traditional sectors like agriculture, food and beauty. The emergence of niche big data companies like Enolytics (“bringing big data insights to the wine industry”) is threatening to...
Coordinated in: Greece
Programme: INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies - Information and Communication Technologies (ICT)
Last update: 10 March 2023

SCARBOn SCARBO next step - Space CARBon Observatory's solution to improve monitoring of GHG emissions and help establishing reliable data for emission trends forecasts
ID: 101135301
From: 1 January 2024 to: 30 June 2026
SCARBOn (Space CARbon Observatory Next step) is the continuation of the Horizon 2020 SCARBO project. This multidisciplinary project is carried out by a gender-diverse team, through a consortium including the space industry, SMEs and scientific institutes. It is led from...
Coordinated in: France
Programme: Space, including Earth Observation, Digital, Industry and Space
Last update: 8 January 2024

PROJE

RoBUTCHER A Robust, Flexible and Scalable Cognitive Robotics Platform
ID: 871631
From: 1 January 2020 to: 30 June 2023
Uptake of advanced robotics and automation in the Agri-Food sector, specifically in meat processing, has been stifled due to the perceived high cost as well as the lack of flexibility, robustness and scalability to suit different volumes, smaller in particular. This conflicts...
Coordinated in: Norway
Programme: INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies - Information and Communication Technologies (ICT)
Last update: 14 September 2023

PROJECT

SMARTLAGOON Innovative modelling approaches for predicting Socio-environMentAl evolution in highly anthRopized coasTal LAGOONs
ID: 101017861
From: 1 January 2021 to: 31 December 2024
Coastal lagoons are ecosystems with great environmental and socioeconomic value. However, these natural systems are especially vulnerable to climatic and anthropogenic pressures, such as intensive agriculture and extensive urbanization as a consequence of the tourist...
Coordinated in: Spain
Programme: EXCELLENT SCIENCE - Future and Emerging Technologies (FET), FET Proactive
Last update: 14 November 2023

ELIAS European Lighthouse of AI for Sustainability
ID: 101120237
From: 1 September 2023 to: 31 August 2027
We live in a crucial historical moment, with tremendous challenges ahead, from climate change to the energy crisis. ELIAS emerges from the belief that AI will be a key discipline to help us tackle these challenges. At the same time, the development of AI entails deep ethical...
Coordinated in: Italy
Programme: Digital, Industry and Space, Artificial Intelligence and Robotics
Last update: 18 September 2023

FindingPheno Unified computational solutions to disentangle biological interactions in multi-omics data
ID: 952914
From: 1 March 2021 to: 28 February 2025
Animal and plant microbiome functions can be modulated, and thereby optimized, for sustainable food production. However, the outcome, i.e., the microbial response, can vary greatly depending on (e.g.)Animal and plant microbiome functions can be modulated, and thereby...
Coordinated in: Denmark
Programme: INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies – Biotechnology
Last update: 24 November 2023

ELECTRO-POM From discovery to scale up of cluster based electrolytes for Ultra-high energy storage flow batteries
ID: 790458
From: 1 March 2018 to: 31 August 2019
Large scale energy storage demands are set to increase dramatically during the next years due to the expansion of renewables. One of the most promising large-scale electrical storage technologies are Redox Flow Battery (RFB) systems, which can convert electrical energy to...
Coordinated in: United Kingdom
Programme: EXCELLENT SCIENCE - European Research Council (ERC)
Last update: 15 August 2022

SNUG Innovative methodology based in circular economy and artificial intelligence to foster the transition to Sustainable and very high eNergy performance bUildinGs at a cost optimal level
ID: 101123150
From: 1 November 2023 to: 30 April 2027
Buildings are responsible for over 40% of the energy consumption and CO2 emissions in EU. Accordingly, The CE has stablished ambitious building standard aiming to transform all existing buildings into ZEBs by 2050 to reach a fully decarbonised building stock.SNUG aims to...
Coordinated in: Spain
Programme: Climate, Energy and Mobility, Buildings and Industrial Facilities in Energy Transition
Last update: 7 November 2023

PROJECT

LiNaBioFluid Laser-induced Nanostructures as Biomimetic Model of Fluid Transport in the Integument of Animals
ID: 665337

From: 1 July 2015 to: 30 June 2018
The integument of an animal body has various functions, which are often achieved by specific micro- and/or nano-hierarchical structures. Examples are the very low water friction and air retention of water spiders or the swim fern of salvinia and the outstanding adhesion...
Coordinated in: Greece
Programme: EXCELLENT SCIENCE - Future and Emerging Technologies (FET), FET Open
Last update: 25 October 2023

E-MUSE Complex microbial ecosystems multiscale modelling: mechanistic and data driven approaches integration.
ID: 956126
From: 1 January 2021 to: 30 June 2025
European dairy industry is an important agri-food sector; it represents more than 300,000 jobs and 10 billion € positive trade balance. Five out of the ten top global dairy companies are European and more than 80% of European companies are SMEs. More than 300 cheeses and...
Coordinated in: France
Programme: EXCELLENT SCIENCE - Marie Skłodowska-Curie Actions, Fostering new skills by means of excellent initial training of researchers
Last update: 28 December 2023

MARCLAIMED Integrated Decision Support Tool for Reliable and Affordable Application of Manage Aquifer Recharge with Alternative Water Resources in River Basin and Drought Management Plans
ID: 101136799
From: 1 February 2024 to: 31 January 2027
MARCLAIMED will be a breakthrough addressing in an efficient, sustainable, and trustworthy way the water scarcity and water stress mitigation. MARCLAIMED will support decision makers to integrate Managed Aquifer Recharge (MAR) with Alternative Water Resources (AWR) in River...
Coordinated in: Spain
Programme: Food, Bioeconomy Natural Resources, Agriculture and Environment
Last update: 17 January 2024

BoSS Bauhaus of the Seas Sails
ID: 101079995
From: 1 January 2023 to: 31 December 2025
"The vision of the BoSS project is to demonstrate and archive solutions for climate neutrality with a particular focus on coastal cities as an interface to healthy seas, ocean and water bodies envisioning a new triangle of sustainability, inclusion, and design focused on the...
Coordinated in: Portugal
Programme: Culture, creativity and inclusive society, Health, Digital, Industry and Space, Civil Security for Society, Climate, Energy and Mobility, Food, Bioeconomy Natural Resources, Agriculture and Environment
Last update: 16 December 2022

ENTROPY DESIGN OF AN INNOVATIVE ENERGY-AWARE IT ECOSYSTEM FOR MOTIVATING BEHAVIOURAL CHANGES TOWARDS THE ADOPTION OF ENERGY EFFICIENT LIFESTYLES
ID: 649849
From: 1 September 2015 to: 30 November 2018
Taking into account the fact that buildings constitute the largest end-use energy consuming sector, the design and development of solutions targeted at reducing their energy consumption based on the adoption of energy efficient techniques and the active engagement of...
Coordinated in: Spain
Programme: SOCIETAL CHALLENGES - Secure, clean and efficient energy, Reducing energy consumption and carbon foorpint by smart and sustainable use
Last update: 19 August 2022

ANEMOS Development of a next generation wind resource forecasting system for the large-scale integration of onshore and offshore wind farms (ANEMOS)
ID: ENK5-CT-2002-00665

From: 1 October 2002 to: 30 September 2006
Objectives and problems to be solved :Accurate forecasting of the wind resource up to two days ahead is recognised as a major contribution for reliable large-scale wind power integration. Especially, in a liberalised electricity market, prediction tools enhance the position of...
Coordinated in: France
Programme: Programme for research, technological development and demonstration on "Energy, environment and sustainable development, 1998-2002"
Last update: 10 March 2023

ANNEX IV:
SUCCESSFUL AI-ENABLED PROJECTS ON ICT, MOBILITY AND SECURITY

ECHO European network of Cybersecurity centres and competence Hub for innovation and Operations
ID: 830943
From: 1 February 2019 to: 28 February 2023
ECHO delivers an organized and coordinated approach to improve proactive cyber defence of the European Union, through effective and efficient multi-sector collaboration. The Partners will execute on a 48-month work plan to develop, model and demonstrate a network of cyber...
Coordinated in: Belgium
Programme: INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies - Information and Communication Technologies (ICT)
Last update: 30 January 2024

FAR-EDGE Factory Automation Edge Computing Operating System Reference Implementation
ID: 723094
From: 1 October 2016 to: 31 October 2019
Despite the proclaimed benefits (i.e. scalability, reliability, cost-effectiveness) of Future Internet (FI) technologies (i.e. edge & cloud computing, IoT/CPS) for factory automation, their adoption from manufacturers remains low for various reasons, including technology...
Coordinated in: Italy
Programme: INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies - Information and Communication Technologies (ICT)
Last update: 14 September 2023

PROJECT

Periodic Reporting for period 1 - CALLISTO (Copernicus Artificial Intelligence Services and data fusion with other distributed data sources and processing at the edge to support DIAS and HPC infrastructures)
Europe’s sustainable economic growth and societal wellbeing can benefit from the exploitation of Earth Observation (EO) data, which is however hindered by the difficulties in accessing, using and interpreting it. The generation of effective information relies on the fusion...
Project: CALLISTO (ID: 101004152)
Programme: INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies – Space
Last update: 9 May 2022

REPORT SUMMARY

AIDA Artificial Intelligence Data Analysis
ID: 776262
From: 1 September 2018 to: 28 February 2022
AIDA brings a transformational innovation to the analysis of heliophysics data in four steps. First, AIDA will develop a new open source software called AIDApp written in Python (a free language) and capable of collecting, combining and correlating data from different space...
Coordinated in: Belgium
Programme: INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies – Space, Enabling exploitation of space data
Last update: 23 December 2022

Final Report Summary - SAMURAI (Suspicious and Abnormal Behaviour Monitoring Using a Network of Cameras & Sensors for Situation Awareness Enhancement)
SAMURAI has developed and integrated an innovative intelligent surveillance system for robust monitoring of both inside and surrounding areas of a critical public infrastructure site (an airport terminal). SAMURAI has four significant novelties that make it...

Project: SAMURAI (ID: 217899)
Programme: Specific Programme "Cooperation": Security
Last update: 23 April 2015

• REPORT SUMMARY

RISE-6G Reconfigurable Intelligent Sustainable Environments for 6G Wireless Networks
ID: 101017011
From: 1 January 2021 to: 31 December 2023
Visions and plans on forthcoming B5G/6G networks aim to provide flexible connect-compute technologies to support future innovative services and uses cases. Considering the 2030 horizon, B5G/6G networks need to create the basis for human-centred smart societies and vertical...
Coordinated in: France
Programme: INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies - Information and Communication Technologies (ICT)
Last update: 5 February 2024

• REPORT SUMMARY

Periodic Reporting for period 2 - AIDA (Artificial Intelligence Data Analysis)
AIDA uses some of the most advanced data analysis techniques to analyse the data available from space missions and from space simulations. AIDA identifies three major trends in our field of research and in the wider society. First, there has been a tremendous accumulation of...
Project: AIDA (ID: 776262)
Programme: INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies – Space
Last update: 14 April 2023

INFORE Interactive Extreme-Scale Analytics and Forecasting
ID: 825070
From: 1 January 2019 to: 31 March 2022
At an increasing rate, industrial and scientific institutions need to deal with massive data flows streaming in from a multitude of sources. For instance, maritime surveillance applications combine high-velocity data streams, including vessel position signals emitted from...
Coordinated in: Greece
Programme: INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies - Information and Communication Technologies (ICT)
Last update: 28 December 2022

• REPORT SUMMARY

Final Report Summary - SMARTOPENDATA (Linked Open Data for environment protection in Smart Regions)
The SmartOpenData project has completed the creation of a Linked Open Data -LOD- infrastructure extended throughout Europe. This research infrastructure has five different pilots as one of its most visible outcomes. Nevertheless, those tools and applications...
Project: SMARTOPENDATA (ID: 603824)
Programme: Specific Programme "Cooperation": Environment (including Climate Change)
Last update: 2 June 2016

• PROJECT

IntelComp A Competitive Intelligence Cloud/HPC Platform for AI-based STI Policy Making
ID: 101004870
From: 1 January 2021 to: 31 December 2023
IntelComp sets out to build an innovative Cloud Platform that will offer Artificial Intelligence based services to public administrators and policy makers across Europe for data- and evidence-driven policy design and implementation in the field of Science, Technology and...
Coordinated in: Spain
Programme: Explore new forms of innovation, with special emphasis on social innovation and creativity and understanding how all forms of innovation are developed, succeed or fail, SOCIETAL CHALLENGES - Europe In A Changing World - Inclusive, Innovative And Reflective Societies
Last update: 22 January 2024

• RESULTS PACK

COPKIT Technology, training and knowledge for Early-Warning / Early-Action led policing in fighting Organised Crime and Terrorism
ID: 786687
From: 1 June 2018 to: 30 September 2021
"The COPKIT project addresses the problem of analysing, preventing, investigating and mitigating the use of new information and communication technologies by organised crime and terrorist groups. This question is a key challenge for policy-makers and LEAs due to the complexity...
Coordinated in: Spain
Programme: Ensure privacy and freedom, including in the Internet and enhance the societal, legal and ethical understanding of all areas of security, risk and management, Secure societies - Protecting freedom and security of Europe and its citizens, Fight crime, illegal trafficking and terrorism, including understanding and tackling terrorist ideas and beliefs
Last update: 20 October 2023

PROJECT

Periodic Reporting for period 2 - NeCOL (NeCOL: An Innovative Methodology for Building Better Deep Learning Tools for Real Word Applications)
Over the last years, the vast increase of digital data and the access to powerful computation resources have stimulated the fourth industrial revolution through the application of Artificial Intelligence (AI), specifically the application of deep neural networks (DNN), a.k.a...
Project: NeCOL (ID: 799078)
Programme: EXCELLENT SCIENCE - Marie Skłodowska-Curie Actions
Last update: 11 January 2022

PROJECT

MATILDA A HOLISTIC, INNOVATIVE FRAMEWORK FOR THE DESIGN, DEVELOPMENT AND ORCHESTRATION OF 5G-READY APPLICATIONS AND NETWORK SERVICES OVER SLICED PROGRAMMABLE INFRASTRUCTURE
ID: 761898
From: 1 June 2017 to: 31 July 2020
The vision of MATILDA is to design and implement a holistic 5G end-to-end services operational framework tackling the lifecycle of design, development and orchestration of 5G-ready applications and 5G network services over programmable infrastructure, following a unified...
Coordinated in: Italy
Programme: INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies - Information and Communication Technologies (ICT)
Last update: 18 August 2022

PROJECT

Explanation in Online Help and Offline Training Based on Continuous Simulation
ID: BRPR950049
From: 1 January 1996 to: 31 December 1998
The main outcomes of the research activities of the EXTRAS project are the generic knowledge framework, and an extensive amount of the software produced which has allowed further steps in developing explanation systems. Explanation systems that are quite difficult, if not imp...
Coordinated in: United Kingdom
Programme: Specific research and technological development programme in the field of industrial and materials technologies, 1994-1998
Last update: 21 October 1999

PROJECT

VISORSURF VisorSurf - A Hardware Platform for Software-driven Functional Metasurfaces
ID: 736876
From: 1 January 2017 to: 31 December 2020
Metasurfaces, thin film planar, artificial structures, have recently enabled the realization of novel electromagnetic (EM) and optical components with engineered functionalities. These include total EM radiation absorption, filtering and steering of light and sound, as well as...
Coordinated in: Greece
Programme: EXCELLENT SCIENCE - Future and Emerging Technologies (FET), FET Open
Last update: 23 August 2022

NonSequeToR Non-sequence models for tokenization replacement
ID: 740516
From: 1 October 2017 to: 30 September 2023
Natural language processing (NLP) is concerned withcomputer-based processing of natural language, withapplications such as human-machine interfaces andinformation access. The capabilities of NLP are currentlyseverely limited compared to humans. NLP has high errorrates for...
Coordinated in: Germany
Programme: EXCELLENT SCIENCE - European Research Council (ERC)
Last update: 23 August 2022

REPORT SUMMARY

Periodic Reporting for period 2 - AI4DI (Artificial Intelligence for Digitizing Industry)
The industrial revolution we are witnessing is driven by increasing complexity, automation, more intelligence and continuous focus on optimization. Today, Artificial intelligence (AI) accelerates this transformation by remodelling industries with new processes and...
Project: AI4DI (ID: 826060)
Programme: ECSEL
Last update: 10 December 2021

INSPIRE-5Gplus INtelligent Security and PervasIve tRust for 5G and Beyond
ID: 871808
From: 1 November 2019 to: 31 October 2022
The goal of INSPIRE-5Gplus is to advance security of 5G and Beyond networks via two main approaches: (1) by leveraging/extending existing assets such as Trusted Execution Environments (TEEs), Remote Attestation/Path Proof/RCA (Root Cause Analysis), and end-to-end liability...
Coordinated in: Germany
Programme: INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies - Information and Communication Technologies (ICT)
Last update: 19 December 2023

&&&&&PROJECT

AutoFair Human-Compatible Artificial Intelligence with Guarantees
ID: 101070568
From: 1 October 2022 to: 30 September 2025
In this proposal, we address the matter of transparency and explainability of AI using approaches inspired by control theory. Notably, we consider a comprehensive and flexible certification of properties of AI pipelines, certain closed-loops and more complicated...
Coordinated in: Czechia
Programme: Digital, Industry and Space, Artificial Intelligence and Robotics
Last update: 4 September 2022

REPORT SUMMARY

Periodic Reporting for period 1 - CALLISTO (Copernicus Artificial Intelligence Services and data fusion with other distributed data sources and processing at the edge to support DIAS and HPC infrastructures)
Europe’s sustainable economic growth and societal wellbeing can benefit from the exploitation of Earth Observation (EO) data, which is however hindered by the difficulties in accessing, using and interpreting it. The generation of effective information relies on the fusion...
Project: CALLISTO (ID: 101004152)
Programme: INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies – Space
Last update: 9 May 2022

REPORT SUMMARY

Periodic Reporting for period 1 - NL4XAI (Interactive Natural Language Technology for Explainable Artificial Intelligence)
The aim of this four-year European project is to use natural language to generate explanations for decisions made by an Artificial Intelligence (AI) system, which are understandable to non-expert users.According to Polanyi's paradox, humans know more than they can explain...
Project: NL4XAI (ID: 860621)

Programme: EXCELLENT SCIENCE - Marie Skłodowska-Curie Actions
Last update: 2 March 2022

Drones4Safety Inspection Drones for Ensuring Safety in Transport Infrastructures
ID: 861111
From: 1 June 2020 to: 31 May 2023
The Drones4Safety project aims to increase the safety of the European civil transport system by building a cooperative, autonomous, and continuously operating drone system that will be offered to railway and bridge operators to inspect their transportation infrastructure...
Coordinated in: Denmark
Programme: SOCIETAL CHALLENGES - Smart, Green And Integrated Transport
Last update: 15 January 2024

STEP2DYNA Spatial-temporal information processing for collision detection in dynamic environments
ID: 691154
From: 1 July 2016 to: 31 December 2021
In the real world, collision happens at every second - often results in serious accidents and fatalities. For example, there are more than 3560 people died from vehicle collision per day worldwide. On the other sector, autonomous unmanned aerial vehicles (UAVs) have...
Coordinated in: United Kingdom
Programme: EXCELLENT SCIENCE - Marie Skłodowska-Curie Actions, Stimulating innovation by means of cross-fertilisation of knowledge
Last update: 8 December 2023

ADAPT Adaptive Decision support for Agents negotiation in electricity market and smart grid Power Transactions
ID: 703689
From: 1 January 2017 to: 31 December 2018
ADAPT explores the theme of decision support for agents negotiations in the complementary environments of electricity markets and smart grids. The EU priority of increasing the penetration of renewable energy sources in the power system has led to the wide acceptance of the...
Coordinated in: Spain
Programme: EXCELLENT SCIENCE - Marie Skłodowska-Curie Actions, Nurturing excellence by means of cross-border and cross-sector mobility
Last update: 11 August 2022
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iTalk2Learn Talk, Tutor, Explore, Learn: Intelligent Tutoring and Exploration for Robust Learning
ID: 318051
From: 1 November 2012 to: 31 October 2015
In the aftermath of the PISA studies, which identified weaknesses of students in many European countries, especially in mathematics, the education of children in the elementary school grades has received a lot of attention. Yet, most learning systems that have been developed ...
Coordinated in: Germany
Programme: Specific Programme "Cooperation": Information and communication technologies
Last update: 22 April 2017

PROJECT

INFORE Interactive Extreme-Scale Analytics and Forecasting
ID: 825070
From: 1 January 2019 to: 31 March 2022
At an increasing rate, industrial and scientific institutions need to deal with massive data flows streaming in from a multitude of sources. For instance, maritime surveillance applications combine high-velocity data streams, including vessel position signals emitted from...
Coordinated in: Greece
Programme: INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies - Information and Communication Technologies (ICT)
Last update: 28 December 2022

NL4XAI Interactive Natural Language Technology for Explainable Artificial Intelligence
ID: 860621
From: 1 October 2019 to: 30 September 2024
According to Polanyi's paradox, humans know more than they can explain, mainly due to the huge amount of implicit knowledge they unconsciously acquire trough culture, heritage, etc. The same applies for Artificial Intelligence (AI) systems mainly learnt automatically from...
Coordinated in: Spain
Programme: EXCELLENT SCIENCE - Marie Skłodowska-Curie Actions, Fostering new skills by means of excellent initial training of researchers
Last update: 15 January 2024

PROJECT

INSPIRE-5Gplus INtelligent Security and PervasIve tRust for 5G and Beyond
ID: 871808
From: 1 November 2019 to: 31 October 2022
The goal of INSPIRE-5Gplus is to advance security of 5G and Beyond networks via two main approaches: (1) by leveraging/extending existing assets such as Trusted Execution Environments (TEEs), Remote Attestation/Path Proof/RCA (Root Cause Analysis), and end-to-end liability...
Coordinated in: Germany
Programme: INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies - Information and Communication Technologies (ICT)
Last update: 19 December 2023

PROJECT DESCRIPTION

ALLIES Artificial inteLLigence In sustainable dEvelopment goalS
ID: 101126626
From: 1 January 2024 to: 31 December 2028
ALLIES (“Artificial inteLLigence In sustainable dEvelopment goalS”) is a new excellent collaborative postdoctoral programme led by the Spanish National Research Council (CSIC) and coordinated through the Artificial Intelligence Research Institute (IIIA) for the recruitment...
Coordinated in: Spain
Programme: Marie Skłodowska-Curie Actions (MSCA)
Last update: 7 November 2023

RESULTS IN BRIEF

Collaborative robots work like humans, with humans
Seamless human-robot collaboration supported by smart mechatronics and AI-based perception exceeds performance targets and inspires team spirit.
Project: SHERLOCK (ID: 820689)
Available languages:
DEENESFRITPL
Last update: 3 February 2023

REPORT SUMMARY

Periodic Reporting for period 2 - COLT-MDP (Computational Learning Theory: compact representation, efficient computation, and societal challenges in learning MDPs)
Artificial Intelligence (AI) and Machine Learning (ML) hold a great promise for advancing humanity over the next decades. While progress in AI was initially slow, mainly due to initial over-expectations, AI made tremendous advances in the last decade. Machine learning is...
Project: COLT-MDP (ID: 882396)
Programme: EXCELLENT SCIENCE - European Research Council (ERC)
Last update: 25 January 2024

PROJECT

QROWD QROWD - Because Big Data Integration is Humanly Possible
ID: 732194
From: 1 December 2016 to: 30 November 2019
Big Data integration in European cities is of utmost importance for municipalities and companies to offer effective information services, enable efficient data-driven transportation and mobility, reduce CO2 emissions, assess the efficiency of infrastructure, as well as enhance...

Coordinated in: United Kingdom
Programme: INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies - Information and Communication Technologies (ICT)
Last update: 16 August 2022

BDVe Big Data Value ecosystem
ID: 732630
From: 1 January 2017 to: 31 December 2020
The mission of BDVe is to support the Big Data Value PPP in realizing a vibrant data-driven EU economy or said in other words, BDVe will support the implementation of the PPP to be a SUCCESS.Behind that mission, there are multiple goals to achieve, which should be taken into...
Coordinated in: Germany
Programme: INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies - Information and Communication Technologies (ICT)
Last update: 4 September 2022

Final Report Summary - MATRIX (New Multi-HAzard and MulTi-RIsK Assessment MethodS for Europe)
Executive Summary:Disaster risk reduction (DDR) activities generally treat different natural hazards and their associated risks separately. However, this approach ignores the spatial and temporal interactions that may arise along the disaster risk chain. For instance, an...
Project: MATRIX (ID: 265138)
Programme: Specific Programme "Cooperation": Environment (including Climate Change)
Last update: 11 February 2015

Final Report Summary - NI2S3 (Net information integration services for security systems)
Executive summary: Complex interactions between the elements of a critical infrastructure (CI) indicate that there is a need to deploy a corresponding infrastructure protection system, which is capable of extending security control to all elements of the protected system, a...
Project: NI2S3 (ID: 225488)
Programme: Specific Programme "Cooperation": Security
Last update: 1 October 2013

REPORT SUMMARY
Periodic Reporting for period 1 - SafeOPS (From Prediction to Decision Support - Strengthening Safe and Scalable ATM Services through Automated Risk Analytics based on Operational Data from Aviation Stakeholders)
The next generation of Air Traffic Management (ATM) systems are pushed more and more towards digitalization, driven by two goals that are hard to combine. Firstly, the demand for capacity and cost-efficiency of air transport operations increases. Secondly, already high levels...
Project: SafeOPS (ID: 892919)
Programme: SOCIETAL CHALLENGES - Smart, Green And Integrated Transport
Last update: 16 May 2022

PROJECT
HR-Recycler Hybrid Human-Robot RECYcling plant for electriCal and eLEctRonic equipment
ID: 820742
From: 1 December 2018 to: 30 November 2022
The technological advances that have been achieved over the past decades have led to a tremendous increase of both the types and the total amount of electrical and electronic equipment that is manufactured. Despite the importance of Waste Electrical and Electronic Equipment...
Coordinated in: Greece
Programme: INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies - Advanced manufacturing and processing, Technologies for Factories of the Future
Last update: 11 December 2023

PROJECT
Enabling virtual worlds and augmented interaction in high-impact applications to support the realisation of Industry 5.0

This Challenge aims at enabling the use of high-fidelity virtual worlds in high-impact markets and applications promoting Industry 5.0 principles of sustainability, human-centric, and resilience by scaling up cutting-edge innovations for platforms, middleware, tools, and...
Available languages:
EN
Last update: 17 October 2023

PROJECT

ATRIA AI-POWERED GROUND SEGMENT CONTROL FOR FLEXIBLE PAYLOADS
ID: 101004215
From: 1 April 2021 to: 31 March 2024
A new generation of completely flexible satellites in terms of mission definition is currently appearing in the space segment as a response to the 5G revolution, resulting in an unprecedented integration of the satellite services with the terrestrial deployments. In this...
Coordinated in: Spain
Programme: Enabling advances in space technology, INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies – Space, Future Internet: Software, hardware, Infrastructures, technologies and services
Last update: 27 December 2023

PROJECT

CALLISTO Copernicus Artificial Intelligence Services and data fusion with other distributed data sources and processing at the edge to support DIAS and HPC infrastructures
ID: 101004152
From: 1 January 2021 to: 31 December 2023
Artificial Intelligence (AI) is already part of our lives and is extensively entering the space sector to offer value-added Earth Observation (EO) products and services. Copernicus data and other georeferenced data sources are often highly heterogeneous, distributed and...
Coordinated in: Italy
Programme: INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies – Space, Enabling exploitation of space data
Last update: 27 December 2023

PROJECT

DOSSIER-Cloud DEVOPS-BASED SOFTWARE ENGINEERING FOR THE CLOUD
ID: 692251
From: 1 January 2016 to: 31 December 2018
DOSSIER-Cloud implements a series of coordination and support actions for transferring knowledge and exchanging best practices in the research area of Software Engineering for Distributed Systems development. It brings together two internationally recognized scientific groups...
Coordinated in: Cyprus
Programme: Twinning of research institutions
Last update: 11 August 2022

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e-DIPLOMA Electronic, Didactic and Innovative Platform for Learning based On Multimedia Assets
ID: 101061424
From: 1 September 2022 to: 31 August 2025
Distance learning has become a great ally in the current Pandemic situation. The e-DIPLOMA project will establish the e-learning in an upper quality level in a three years' research project, posing the use of Augmented Reality/Virtual Reality, Artificial Intelligence...
Coordinated in: Spain
Programme: Culture, creativity and inclusive society, Social and Economic Transformations
Last update: 16 September 2022

SoBigData SoBigData Research Infrastructure
ID: 654024
From: 1 September 2015 to: 31 December 2019
One of the most pressing and fascinating challenges scientists face today, is understanding the complexity of our globally interconnected society. The big data arising from the digital breadcrumbs of human activities promise to let us scrutinize the ground truth of individual...
Coordinated in: Italy

Programme: Integrating and opening existing national and regional research infrastructures of European interest, EXCELLENT SCIENCE - Research Infrastructures
Last update: 5 September 2023

PROJECT

ATRIA AI-POWERED GROUND SEGMENT CONTROL FOR FLEXIBLE PAYLOADS
ID: 101004215
From: 1 April 2021 to: 31 March 2024
A new generation of completely flexible satellites in terms of mission definition is currently appearing in the space segment as a response to the 5G revolution, resulting in an unprecedented integration of the satellite services with the terrestrial deployments. In this...
Coordinated in: Spain
Programme: Enabling advances in space technology, INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies – Space, Future Internet: Software, hardware, Infrastructures, technologies and services
Last update: 27 December 2023

PROJECT

MANiBOT Advancing the physical intelligence and performance of roBOTs towards human-like bi-manual objects MANipulation
ID: 101120823
From: 1 November 2023 to: 30 April 2027
The MANiBOT research aims at bi-manual mobile robots, able to perform a wide variety of manipulation tasks with highly diverse objects, possibly partly or fully unknown beforehand, in a human-like manner and performance. To achieve this, we advance and fuse all necessary...
Coordinated in: Greece
Programme: Digital, Industry and Space, Artificial Intelligence and Robotics
Last update: 7 July 2023

PROJECT

PALAEMON PALAEMON – A holistic passenger ship evacuation and rescue ecosystem
ID: 814962
From: 1 June 2019 to: 31 January 2023
PALAEMON proposes the development and evaluation of a sophisticated mass centralised evacuation system, based on a radical re-thinking of Mass Evacuation Vessels (MEVs) combined with an intelligent ecosystem of critical components providing real-time access to and...
Coordinated in: France
Programme: SOCIETAL CHALLENGES - Smart, Green And Integrated Transport
Last update: 2 January 2024

QUARTZ Quantum Information Access and Retrieval Theory
ID: 721321
From: 1 January 2017 to: 31 December 2020
Quantum Information Access and Retrieval TheoryWe aim to establish an European Training Network (ETN) on QUantum information Access and Retrieval Theory (QUARTZ). Towards a new approach to Information Access and Retrieval (IAR) addressing the challenges of the dynamic and...
Coordinated in: Italy
Programme: EXCELLENT SCIENCE - Marie Skłodowska-Curie Actions, Fostering new skills by means of excellent initial training of researchers
Last update: 23 August 2022

PROJECT

ARESIBO Augmented Reality Enriched Situation awareness for Border security
ID: 833805
From: 1 May 2019 to: 31 July 2022
ARESIBO aims at improving the efficiency of the border surveillance systems by providing the operational teams and the tactical command and control level with an accurate and comprehensive information. The pillars of research in ARESIBO are three-fold: 1. Set-up a complete...
Coordinated in: France
Programme: Secure societies - Protecting freedom and security of Europe and its citizens, Strengthen security through border management, Support the Union's external security policies including through conflict prevention and peace-building

Last update: 13 June 2023

PROJECT

RIDE2RAIL Travel Companion enhancements and RIDE-sharing services syncronised to RAIL and Public Transport

ID: 881825

From: 1 December 2019 to: 30 April 2023

RIDE2RAIL aims to integrate multiple (public/private/social) data sets and sources and existing transport platforms to promote an effective Ride Sharing practice of citizens, making it a complementary transport mode that extends public transport and rail networks. The...

Coordinated in: Belgium

Programme: Innovation Programme 4: IT Solutions for attractive railway services, SOCIETAL CHALLENGES - Smart, Green And Integrated Transport

Last update: 18 December 2023

PROJECT

MUSKETEER Machine learning to augment shared knowledge in federated privacy-preserving scenarios

ID: 824988

From: 1 December 2018 to: 30 November 2021

The massive increase in data collected and stored worldwide calls for new ways to preserve privacy while still allowing data sharing among multiple data owners. Today, the lack of trusted and secure environments for data sharing inhibits data economy while legality, privacy...

Coordinated in: Ireland

Programme: INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies - Information and Communication Technologies (ICT)

Last update: 26 July 2022

SPARTA Strategic programs for advanced research and technology in Europe

ID: 830892

From: 1 February 2019 to: 30 June 2022

In the domain of Cybersecurity Research and innovation, European scientists hold pioneering positions in fields such as cryptography, formal methods, or secure components. Yet this excellence on focused domains does not translate into larger-scale, system-level advantages...

Coordinated in: France

Programme: INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies - Information and Communication Technologies (ICT)

Last update: 11 September 2023

PROJECT

DE4A Digital Europe for All

ID: 870635

From: 1 January 2020 to: 30 April 2023

For a completely working Digital Single Market, effectively enabling the cross-border exercise by citizens and businesses of their Single Market rights, Member States must address several challenges on delivering better services. DE4A is a Member State-driven pilot, aligned...

Coordinated in: Spain

Programme: Explore new forms of innovation, with special emphasis on social innovation and creativity and understanding how all forms of innovation are developed, succeed or fail, SOCIETAL CHALLENGES - Europe In A Changing World - Inclusive, Innovative And Reflective Societies

Last update: 19 December 2023

SCOUT Safe and COnnected aUtomation in road Transport

ID: 713843

From: 1 July 2016 to: 30 June 2018

"The project ""Safe and COnnected aUtomation in road Transport"" (SCOUT) aims at identifying pathways for an accelerated proliferation of safe and connected high-degree automated driving in Europe, taking into account user needs and expectations, technical and non-technical...

Coordinated in: Germany

Programme: SOCIETAL CHALLENGES - Smart, Green And Integrated Transport

Last update: 16 August 2022

7SHIELD Safety and Security Standards of Space Systems, ground Segments and Satellite data assets, via prevention, detection, response and mitigation of physical and cyber threats
ID: 883284
From: 1 September 2020 to: 28 February 2023
The project addresses the security and the resilience of EU Ground Segments of Space Systems, meeting the crosscutting and the sectorial criteria of the EU critical infrastructures (2008/14). The Copernicus era has created a new market with the massive amounts of satellite...
Coordinated in: Italy
Programme: Improve cyber security, Secure societies - Protecting freedom and security of Europe and its citizens, Protect and improve the resilience of critical infrastructures, supply chains and tranport modes
Last update: 19 December 2023

SANCUS SANCUS: analysis software scheme of uniform statistical sampling, audit and defence processes
ID: 952672
From: 1 September 2020 to: 30 November 2023
The project involves 15 Partners from 8 European countries, and aims to design and develop an analySis software scheme of uNiform statistiCal sampling, aUdit and defence proceSses (SANCUS – an Roman god of trust). The main idea draws on formalising the logic of expressing...
Coordinated in: France
Programme: INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies - Information and Communication Technologies (ICT)
Last update: 5 February 2024

PROJECT

AGENTCITIES.RTD Testbed for Worldwide Agent Network: Research and Development
ID: IST-2000-28385
From: 1 July 2001 to: 30 June 2003
The Agentcity vision is: An ambient proactive environment where heterogeneous autonomous and increasingly intelligent systems representing businesses, services and individuals are able to interact with each other in a peer to peer manner and enable flexible and dynamic composi...
Coordinated in: France
Programme: Programme for research, technological development and demonstration on a "User-friendly information society, 1998-2002"
Last update: 13 June 2005

PROJECT

HR-Recycler Hybrid Human-Robot RECYcling plant for electriCal and eLEctRonic equipment
ID: 820742
From: 1 December 2018 to: 30 November 2022
The technological advances that have been achieved over the past decades have led to a tremendous increase of both the types and the total amount of electrical and electronic equipment that is manufactured. Despite the importance of Waste Electrical and Electronic Equipment...
Coordinated in: Greece
Programme: INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies - Advanced manufacturing and processing, Technologies for Factories of the Future
Last update: 11 December 2023

PROJECT

DIH-World DIH-World - Accelerating deployment and matureness of DIHs for the benefit of Digitisation of European SMEs
ID: 952176
From: 1 July 2020 to: 30 June 2023
DIH-World aims to accelerate the uptake of advanced digital technologies by European manufacturing SMEs in all sectors and support them in building sustainable competitive advantages and reaching global markets strengthening the capacities of regional DIHs, particularly in...
Coordinated in: Spain
Programme: INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies - Information and Communication Technologies (ICT)
Last update: 27 December 2023

PROJECT

METRO-HAUL METRO High bandwidth, 5G Application-aware optical network, with edge storage, compUte and low Latency

ID: 761727

From: 1 June 2017 to: 30 September 2020

METRO-HAUL is a project proposal addressing the Horizon 2020 ICT-07 5G PPP call; it is an RIA, focusing on strand 2 (high capacity elastic – optical networks) and strand 3 (software networks). The central topic is cost-efficient optical metro networks for 5G backhaul. The...

Coordinated in: United Kingdom

Programme: INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies - Information and Communication Technologies (ICT)

Last update: 25 August 2022

PROJECT

ENSURESEC End-to-end Security of the Digital Single Market's E-commerce and Delivery Service Ecosystem

ID: 883242

From: 1 June 2020 to: 31 May 2022

ENSURESEC is a sociotechnical solution for safeguarding the Digital Single Market's e-commerce operations against cyber and physical threats. It combines an automatic, rigorous, distributed and open-source toolkit for protecting e-commerce, with monitoring of the impact of...

Coordinated in: Portugal

Programme: Improve cyber security, Secure societies - Protecting freedom and security of Europe and its citizens, Protect and improve the resilience of critical infrastructures, supply chains and tranport modes

Last update: 19 December 2023

PROJECT

DataVaults Persistent Personal Data Vaults Empowering a Secure and Privacy Preserving Data Storage, Analysis, Sharing and Monetisation Platform

ID: 871755

From: 1 January 2020 to: 30 April 2023

A strong data economy is emerging in Europe, where both large companies and SMEs acknowledge the fundamental value of Big Data to cause disruptive change in markets and business models .Nevertheless, the growth of the data economy is hampered by the lack of trusted, secure and...

Coordinated in: Germany

Programme: INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies - Information and Communication Technologies (ICT)

Last update: 18 December 2023

PROJECT

ChipAI Energy-efficient and high-bandwidth neuromorphic nanophotonic Chips for Artificial Intelligence systems

ID: 828841

From: 1 March 2019 to: 30 November 2022

The same way the internet revolutionized our society, the rise of Artificial Intelligence (AI) that can learn without the need of explicit instructions is transforming our life. AI uses brain inspired neural network algorithms powered by computers. However, these central...

Coordinated in: Portugal

Programme: EXCELLENT SCIENCE - Future and Emerging Technologies (FET), FET Open

Last update: 6 February 2024

PRO-ACT Planetary RObots Deployed for Assembly and Construction Tasks

ID: 821903

From: 1 February 2019 to: 30 April 2021

The proposal addresses the establishment, with the support of mobile robotic platforms, of a precursor lunar base with essential capabilities in preparation to commercial exploitation of in-situ resources by assembling an ISRU resource extraction and utilization system will be...

Coordinated in: Belgium

Programme: Enabling European competitiveness, non-dependence and innovation of the European space sector, Enabling advances in space technology, INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies – Space

Last update: 25 August 2022

PROJECT

IM-SAFE Harmonised Transport Infrastructure Monitoring in Europe for Optimal Maintenance and Safety
ID: 958171
From: 1 November 2020 to: 30 April 2023
Transport infrastructure is highly important on the EU Strategic Agenda. This infrastructure is facing real challenges due to ageing, rapid growth of traffic loads, and natural and man-made resilience threats. Safety risks have become critical in the recent years and...
Coordinated in: Netherlands
Programme: INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies - Advanced manufacturing and processing, INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies - Advanced materials
Last update: 26 May 2022

PROJECT

UNICORE A Common Code Base and Toolkit for Deployment of Applications to Secure and Reliable Virtual Execution Environments
ID: 825377
From: 1 January 2019 to: 31 March 2022
Quickly developing, upgrading and deploying applications is the core function of the software and IT industry, often achieved through running software on shared hardware (e.g., on data centers) in order to reduce costs and improve profitability. At this point however, the...
Coordinated in: Romania
Programme: INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies - Information and Communication Technologies (ICT)
Last update: 2 December 2022

DroC2om Drone Critical Communications
ID: 763601
From: 1 September 2017 to: 31 August 2019
The key objective of the DroC2om project is to contribute to the definition of integrated cellular-satellite data link specifications for UASs. Major focus will be on the design and evaluation of data links based on experimental radio investigations and system simulations. The...
Coordinated in: Denmark
Programme: SOCIETAL CHALLENGES - Smart, Green And Integrated Transport, SESAR JU
Last update: 24 May 2023

PHYSICS Optimized hybrid space-time service continuum in FAAS
ID: 101017047
From: 1 January 2021 to: 31 December 2023
PHYSICS empowers European CSPs exploit the most modern, scalable and cost-effective cloud model (FaaS), operated across multiple service and hardware types, provider locations, edge, and multi-cloud resources. To this end, it applies a unified continuum approach, including...
Coordinated in: Italy
Programme: INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies - Information and Communication Technologies (ICT)
Last update: 28 December 2023

PROJECT

INTER-IoT Interoperability of Heterogeneous IoT Platforms
ID: 687283
From: 1 January 2016 to: 31 December 2018
INTER-IoT project is aiming at the design, implementation and experimentation of an open cross-layer framework and associated methodology to provide voluntary interoperability among heterogeneous Internet of Things (IoT) platforms. The proposal will allow developing...
Coordinated in: Spain
Programme: INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies - Information and Communication Technologies (ICT)
Last update: 11 August 2022

PROJECT

Multi-Moby Safe, Secure, High Performing Multi-Passanger and Multi-Commercial Uses Affordable EVs

ID: 101006953
From: 1 December 2020 to: 30 November 2023
MULTI-MOBY is an ambitious proposal aiming at quickly finalizing the results of a cluster of GV and FoF EU projects addressing the development of technology for safe, efficient and affordable urban electric vehicles.A fleet of multi-passenger and multi-purpose commercial vans...
Coordinated in: Austria
Programme: SOCIETAL CHALLENGES - Smart, Green And Integrated Transport
Last update: 8 December 2023

PROJECT

OPERANDO Online Privacy Enforcement, Rights Assurance and Optimization
ID: 653704
From: 1 May 2015 to: 30 April 2018
The goal of the OPERANDO project is to specify, implement, field-test, validate and exploit an innovative privacy enforcement platform that will enable the Privacy as a Service (PaS) business paradigm and the market for online privacy services.The OPERANDO project will...
Coordinated in: United Kingdom
Programme: Secure societies - Protecting freedom and security of Europe and its citizens
Last update: 9 August 2022

PROJECT

SUaaVE SUpporting acceptance of automated VEhicle
ID: 814999
From: 1 May 2019 to: 31 October 2022
While the deployment of connected automated vehicle (CAV) turns into reality, its acceptance has been called into question. Societal issues regarding public acceptance, user awareness and ethics, therefore, become priority concerns. The approach based on the technology push...
Coordinated in: Spain
Programme: SOCIETAL CHALLENGES - Smart, Green And Integrated Transport
Last update: 2 February 2024

AMBEATion Analog/Mixed Signal Back End Design Automation based on Machine Learning and Artificial Intelligence Techniques
ID: 101007730
From: 1 September 2021 to: 31 August 2025
In the field of the Electronic Integrated circuit design, the analog-mixed-signal (AMS) physical design of all analog blocks and of whole integrated circuits (IC) based on the Analog-on-Top approach still uses a handmade flow. The Electronic Design Automation (EDA) industry...
Coordinated in: Italy
Programme: EXCELLENT SCIENCE - Marie Skłodowska-Curie Actions, Stimulating innovation by means of cross-fertilisation of knowledge
Last update: 18 December 2023

PROJECT

CyCAT Cyprus Center for Algorithmic Transparency
ID: 810105
From: 1 October 2018 to: 31 December 2021
Despite strong indications that Cyprus is now in stable economic recovery, and that the island boasts one of the highest rates of tertiary educational attainment in Europe, the picture painted regarding the level of digital skills among citizens is a dismal one. In the 2017...
Coordinated in: Cyprus
Programme: Twinning of research institutions
Last update: 15 September 2022

PROJECT

NEPHELE A LIGHTWEIGHT SOFTWARE STACK AND SYNERGETIC META-ORCHESTRATION FRAMEWORK FOR THE NEXT GENERATION COMPUTE CONTINUUM
ID: 101070487
From: 1 September 2022 to: 31 August 2025

The vision of NEPHELE is to enable the efficient, reliable and secure end-to-end orchestration of hyper-distributed applications over programmable infrastructure that is spanning across the compute continuum from Cloud-to-Edge-to-IoT, removing existing openness and...
Coordinated in: Greece
Programme: Digital, Industry and Space, Advanced Computing and Big Data
Last update: 26 August 2022

PROJECT

CUE-GO Contextual Radio Cues for Enhancing Decision Making in Networks of Autonomous Agents
ID: 101116257
From: 1 January 2024 to: 31 December 2028
The CUE-GO project aims to conceive a novel methodological framework for enhancing the decision-making capabilities of autonomous agents through the exploitation of contextual radio cues of the environment. Radio cues represent a quantum leap from the traditional concept of...
Coordinated in: Italy
Programme: European Research Council (ERC)
Last update: 12 October 2023

PROJECT

AI-Comp Artificial Intelligence and Competition
ID: 101098332
From: 1 November 2023 to: 31 October 2028
AI algorithms are increasingly being used in markets. It is generally agreed that they create a wealth of value by facilitating economic interactions. However, there are also concerns that when applied to market environments, they could lessen competition and harm consumers...
Coordinated in: Italy
Programme: European Research Council (ERC)
Last update: 3 November 2023

PROJECT

ERINIA Evaluating the Robustness of Non-Credible Text Identification by Anticipating Adversarial Actions
ID: 101060930
From: 1 November 2022 to: 31 October 2024
As challenges posed by misinformation become apparent in the modern digital society, state-of-the-art methods of Artificial Intelligence, especially Natural Language Processing (NLP) and Machine Learning, are considered as countermeasures. Indeed, previous research has shown...
Coordinated in: Spain
Programme: Marie Skłodowska-Curie Actions (MSCA)
Last update: 26 August 2022

PROJECT

ELISE European Learning and Intelligent Systems Excellence
ID: 951847
From: 1 September 2020 to: 31 August 2024
ELISE aims to make Europe competitive in AI through a network of excellence. The best European researchers in machine learning and AI have worked together to attract talent, to foster research through collaboration, and to inspire and be inspired by industry and society. While...
Coordinated in: Finland
Programme: INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies - Information and Communication Technologies (ICT)
Last update: 27 December 2023

PROJECT

EMERALD Evidence Management for Continuous Certification as a Service in the Cloud
ID: 101120688
From: 1 November 2023 to: 31 October 2026
Cloud-based services have grown from basic computing services to complex ecosystems, comprising (virtual) infrastructure, business processes and application code. These advanced services also increasingly leverage the usage of Artificial Intelligence, including Machine...
Coordinated in: Spain
Programme: Cybersecurity, Civil Security for Society

Last update: 11 July 2023

PROJECT

CIO Common Interactive Objects
ID: 740548
From: 1 December 2017 to: 31 May 2023
In CIO, common interactive objects are developed and explored to extend human control over the technological environment by human beings, both individually and together. CIO leads to a coherent framework of user interfaces to be applied in interaction design. Common...
Coordinated in: Denmark
Programme: EXCELLENT SCIENCE - European Research Council (ERC)
Last update: 6 February 2024

PROJECT

INDIA Intelligent Networking of Dynamically Interrelated Actors
ID: IST-2000-28413
From: 1 September 2001 to: 31 January 2004
India will develop and test a methodology and an Internet based service, to transform the structure of a traditional company (Constellation Driver) value chain, from a sequence of activities involving a limited number of partners to a dynamic organisation with constellation of...
Coordinated in: Italy
Programme: Programme for research, technological development and demonstration on a "User-friendly information society, 1998-2002"
Last update: 13 June 2005

PROJECT

DEL4ALL Digital Enhanced Learning for ALL
ID: 871573
From: 1 January 2020 to: 30 April 2022
The main goal of DEL4ALL is to transform the current European research and innovation initiatives in the area of digital enhanced learning into an increasingly cohesive, dynamic, participatory and sustainable ecosystem, capable of effectively stimulating collaboration among...
Coordinated in: Switzerland
Programme: INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies - Information and Communication Technologies (ICT)
Last update: 18 December 2023

PROJECT

KLEAN Knowledge-based EFB for green flight trajectory decision aid
ID: 306927
From: 1 June 2012 to: 31 July 2014
"The MAIN OBJECTIVE of the KLEAN project is to develop a custom knowledge-based EFB (Electronic Flight Bag) with SW packages implementing Advanced Weather Radar Post-processor (AWRP) and QAI (Quasi-Artificial Intelligence) agent algorithms, provided by Selex Galileo, for gree...
Coordinated in: Italy
Programme: Specific Programme "Cooperation": Joint Technology Initiatives
Last update: 11 March 2015

PROJECT

Knowledge-based planning systems for autonomous agents - cognitive robotics at work
ID: FMBI983267
From: 1 December 1998 to: 31 May 1999
Research objectives and content The proposed project has the goal of applying the technology of advanced deductive databases and knowledge representation systems to the field of autonomous agents, in particular mobile robots. Indeed, recent research on cognitive robotics, a...
Coordinated in: Austria
Programme: Specific research and technological development programme in the field of the training and mobility of researchers, 1994-1998
Last update: 5 April 2023

PROJECT

COSSIM A Novel, Comprehensible, Ultra-Fast, Security-Aware CPS Simulator
ID: 644042
From: 1 February 2015 to: 31 January 2018
One of the main problems the CPS designers face is “the lack of simulation tools and models for system design and analysis”. This is mainly because the majority of the existing simulation tools for complex CPS handle efficiently only parts of a system while they mainly...
Coordinated in: Greece
Programme: A new generation of components and systems: Engineering of advanced embedded and energy and resource efficient components and systems, INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies - Information and Communication Technologies (ICT)
Last update: 7 September 2023

PROJECT

LAZARUS pLatform for Analysis of Resilient and secUre Software
ID: 101070303
From: 1 September 2022 to: 31 August 2025
LAZARUS is a three-year research and innovation project that aims to heal many of the security issues that befall modern software during its development lifecycle. The recently introduced area of DevSecOps - in medium to large companies - unfortunately lacks automated security...
Coordinated in: Greece
Programme: Cybersecurity, Civil Security for Society
Last update: 15 September 2022

PROJECT

TRAPEZE TRAPEZE - TRAnsparency, Privacy and security for European citiZEns
ID: 883464
From: 1 September 2020 to: 31 August 2023
The TRAPEZE project aims to drive a cultural shift in the protection of the European data economy by weaving trust into its very foundation and reconstructing the concepts of control, transparency, and compliance through technical and methodological, citizen-first...
Coordinated in: Belgium
Programme: Ensure privacy and freedom, including in the Internet and enhance the societal, legal and ethical understanding of all areas of security, risk and management, Improve cyber security, Secure societies - Protecting freedom and security of Europe and its citizens
Last update: 7 September 2023

E-PILOTS Evolution of cockPIt operations Levering on cOgnitive compuTing Services
ID: 831993
From: 1 January 2019 to: 31 December 2021
New technologies have allowed pilots to assume more responsibilities reducing the number of some mechanic and repetitive tasks through automation. The flight deck transition to digital computer-based flight management system has shown a reduction of the workload across a...
Coordinated in: Spain
Programme: SOCIETAL CHALLENGES - Smart, Green And Integrated Transport, Thematic Topics
Last update: 13 June 2022

PROJECT

EuDEco Modelling the European data economy
ID: 645244
From: 1 February 2015 to: 31 January 2018
The Modelling the European Data Economy (EuDEco) project will assist European sci-ence and industry in understanding and exploiting the potentials of data reuse in the context of Big and Open Data big data. The aim isto establish a self sustaining data market and thereby...
Coordinated in: Germany
Programme: Content technologies and information management: ICT for digital content, cultural and creative industries, INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies - Information and Communication Technologies (ICT)
Last update: 8 August 2022

PROJECT

CHARITY Cloud for Holography and Cross Reality

ID: 101016509
From: 1 January 2021 to: 30 June 2024
The impact of technology in the world's panorama is at an all-time high. Advanced media applications enabling immersive communication are becoming ubiquitous in our lives, and there is a global trend to adopt virtual solutions to support day-to-day business operations, social...
Coordinated in: Germany
Programme: INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies - Information and Communication Technologies (ICT)
Last update: 30 January 2024

ExtremeXP EXPeriment driven and user eXPerience oriented analytics for eXtremely Precise outcomes and decisions
ID: 101093164
From: 1 January 2023 to: 31 December 2025
Extreme data characteristics (volume, speed, heterogeneity, distribution, diverse quality, etc.) challenge the state-of-the-art data-driven analytics and decision-making approaches in many critical domains such as crisis management, predictive maintenance, mobility, public...
Coordinated in: Greece
Programme: Digital, Industry and Space, Advanced Computing and Big Data
Last update: 25 November 2022

EU-IoT The European IoT HUb - Growing a sustainable and comprehensive ecosystem for Next Generation Internet of Things
ID: 956671
From: 1 October 2020 to: 31 March 2023
EU-IoT will act as an accelerator for the whole European IoT ecosystem towards transforming the current IoT community of researchers and innovators in Europe into an increasingly cohesive, dynamic, participatory and sustainable ecosystem, as an essential part of the Next...
Coordinated in: Switzerland
Programme: INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies - Information and Communication Technologies (ICT)
Last update: 18 December 2023

PROJECT
CYRENE Certifying the Security and Resilience of Supply Chain Services
ID: 952690
From: 1 October 2020 to: 30 September 2023
Despite the tremendous socio-economic importance of Supply Chains (SCs), security officers and operators have still no easy and integrated way to protect their interconnected Critical Infrastructures (CIs) and cyber systems in the new digital era. CYRENE vision is to enhance...
Coordinated in: Italy
Programme: INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies - Information and Communication Technologies (ICT)
Last update: 28 December 2023

PROJECT
NanoCommons The European Nanotechnology Community Informatics Platform: Bridging data and disciplinary gaps for industry and regulators (NanoCommons)
ID: 731032
From: 1 January 2018 to: 30 June 2022
Nanotechnologies and the resulting novel and emerging materials (NEMs) represent major areas of investment and growth for the European economy. Recent advances have enabled confidence in the understanding of what constitutes toxicity of NEMs in relation to health and...
Coordinated in: United Kingdom
Programme: Integrating and opening existing national and regional research infrastructures of European interest, EXCELLENT SCIENCE - Research Infrastructures
Last update: 8 December 2023

ASCENT Autonomous Vehicular Edge Computing and Networking for Intelligent Transportation
ID: 101086159
From: 1 March 2023 to: 28 February 2027

Intelligent Transportation Systems (ITS) are vital for enhancing road safety, alleviating traffic congestion, and saving energy in transport. However, due to the complex and dynamic operating environments of ITS including fast-moving vehicles, fluctuating vehicular...
Coordinated in: Sweden
Programme: Marie Skłodowska-Curie Actions (MSCA)
Last update: 17 October 2022

PROJECT

5G-CARMEN 5G for Connected and Automated Road Mobility in the European UnioN
ID: 825012
From: 1 November 2018 to: 31 July 2022
European mobility is drastically changing: growing urbanisation, environmental aspects, and safety are only a few of the key indicators pointing in this direction. Road infrastructures and vehicles are blending with the digital world, becoming always-connected, automated and...
Coordinated in: Italy
Programme: INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies - Information and Communication Technologies (ICT)
Last update: 11 December 2023

PROJECT

EMPYREAN EMPYREAN: TRUSTWORTHY, COGNITIVE AND AI-DRIVEN COLLABORATIVE ASSOCIATIONS OF IOT DEVICES AND EDGE RESOURCES FOR DATA PROCESSING
ID: 101136024
From: 1 February 2024 to: 31 January 2027
EMPYREAN envisages a hyper-distributed computing paradigm, based on federations of collaborative and heterogeneous IoT devices and resources (e.g., on RISC-V) across different providers and networks. These federations, namely Associations, operate autonomously and interconnect...
Coordinated in: Greece
Programme: Digital, Industry and Space, Artificial Intelligence and Robotics
Last update: 8 January 2024

PROJECT

LEGaTO Low Energy Toolset for Heterogeneous Computing
ID: 780681
From: 1 December 2017 to: 30 November 2020
Recently system integrators have dramatically increased their efforts in heterogeneous computing by integrating heterogeneous cores on die (ARM), utilizing general purpose GPUs (NVIDIA), combining CPUs and GPUs on same die (Intel, AMD), leveraging FPGAs (Altera, Xilinx)...
Coordinated in: Spain
Programme: INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies - Information and Communication Technologies (ICT)
Last update: 11 July 2023

PROJECT

NEUROKIT2E Open source deep learning platform dedicated to Embedded hardware and Europe
ID: 101112268
From: 1 June 2023 to: 31 May 2026
The NEUROKIT2E project aims at proposing a Deep Learning Platform for Embedded Hardware around an established European value chain (providing AI hardware and software). This open source platform will provide the necessary tools for Europe to play on the same level with its...
Coordinated in: France
Programme: Digital, Industry and Space, Key Digital Technologies
Last update: 28 June 2023

PROJECT

INSPIRE-5Gplus INtelligent Security and PervasIve tRust for 5G and Beyond
ID: 871808
From: 1 November 2019 to: 31 October 2022
The goal of INSPIRE-5Gplus is to advance security of 5G and Beyond networks via two main approaches: (1) by leveraging/extending existing assets such as Trusted Execution Environments (TEEs), Remote Attestation/Path Proof/RCA (Root Cause Analysis), and end-to-end liability...

Coordinated in: Germany
Programme: INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies - Information and Communication Technologies (ICT)
Last update: 19 December 2023

PROJECT

ATMOSPHERE Adaptive, Trustworthy, Manageable, Orchestrated, Secure, Privacy-assuring, Hybrid Ecosystem for REsilient Cloud Computing
ID: 777154
From: 1 November 2017 to: 31 October 2019
ATMOSPHERE (Adaptive, Trustworthy, Manageable, Orchestrated, Secure Privacy-assuring Hybrid, Ecosystem for REsilient Cloud Computing) is a 24-month project aiming at the design and development of an ecosystem of a framework, platform and application of next generation...
Coordinated in: Spain
Programme: INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies - Information and Communication Technologies (ICT)
Last update: 24 July 2023

PROJECT

FASTPARSE Fast Natural Language Parsing for Large-Scale NLP
ID: 714150
From: 1 February 2017 to: 31 July 2022
The popularization of information technology and the Internet has resulted in an unprecedented growth in the scale at which individuals and institutions generate, communicate and access information. In this context, the effective leveraging of the vast amounts of available...
Coordinated in: Spain
Programme: EXCELLENT SCIENCE - European Research Council (ERC)
Last update: 2 February 2024

PROJECT

BRAINE Big data pRocessing and Artificial Intelligence at the Network Edge
ID: 876967
From: 1 May 2020 to: 30 November 2023
Edge computing offers many technical advantages, e.g., reduced latency, secure decentralized processing and storage, scalability at lower complexity, versatility to adapt the changes in resources and applications, and increased reliability. Edge computing can dramatically...
Coordinated in: Italy
Programme: ECSEL, INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies - Information and Communication Technologies (ICT)
Last update: 18 December 2023

AIRPASS Advanced Integrated RPAS Avionics Safety Suite
ID: 763658
From: 1 November 2017 to: 29 February 2020
This proposal addresses “Topic 03: Aircraft Systems” of the SESAR ER RPAS call. Drones appear in a large variety of types, configurations and sizes. They are operated in a large variety of operational environments (i.e. locations, classes of airspace). However, it is...
Coordinated in: Germany
Programme: SOCIETAL CHALLENGES - Smart, Green And Integrated Transport, SESAR JU
Last update: 17 August 2022

PROJECT

FleXunity Scaling-up Power Flexible Communities business models powered by Blockchain and AI
ID: 870146
From: 1 December 2019 to: 31 May 2022
The objective of FleXunity project is to deploy novel services for retailers and aggregators, enhanced by Virtual Power Plant (VPP) technology powered with AI algorithms that can be focused on minimizing the cost of energy (bought in the wholesale market) and optimizing the...
Coordinated in: Portugal
Programme: PRIORITY 'Societal challenges, Horizon 2020 Framework Programme, INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies

Last update: 19 December 2023

Stein-ML Stein’s method and functional inequalities in machine learning
ID: 101024264
From: 1 September 2021 to: 30 November 2023
The project aims to develop quality measures for approximations in machine learning and statistics, using tools of probability and functional analysis, such as Stein's method and functional inequalities. Approximate inference techniques have been used in the recent years as a...
Coordinated in: Luxembourg
Programme: EXCELLENT SCIENCE - Marie Skłodowska-Curie Actions, Nurturing excellence by means of cross-border and cross-sector mobility
Last update: 24 November 2023

PROJECT

EXPLOR EXperimentation and simulation based PLatform for beyond 5G Optical-wireless network Research and development
ID: 872897
From: 1 January 2020 to: 31 August 2024
The EXPLOR project proposes the development of a comprehensive modular software with fully validated state of the art (SOTA) component and system level numerical models, cognitive and adaptive features, as well as libraries with novel use cases and scenarios targeting Next...
Coordinated in: Portugal
Programme: EXCELLENT SCIENCE - Marie Skłodowska-Curie Actions, Stimulating innovation by means of cross-fertilisation of knowledge
Last update: 5 February 2024

PROJECT

PRAETORIAN Protection of Critical Infrastructures from advanced combined cyber and physical threats
ID: 101021274
From: 1 June 2021 to: 30 September 2023
PRAETORIAN strategic goal is to increase the security and resilience of European CIs, facilitating the coordinated protection of interrelated CI against combined physical and cyber threats. To that end, the project will provide a multidimensional (economical, technological...
Coordinated in: France
Programme: Improve cyber security, Secure societies - Protecting freedom and security of Europe and its citizens, Protect and improve the resilience of critical infrastructures, supply chains and tranport modes
Last update: 28 December 2023

ROBINS Robotics Technology for Inspection of Ships
ID: 779776
From: 1 January 2018 to: 30 June 2021
The ROBINS project aims at filling the technology and regulatory gaps that today still represent a barrier to the adoption of Robotics and Autonomous Systems (RAS) in activities related to inspection of ships, understanding end user’s actual needs and expectations and...
Coordinated in: Italy
Programme: INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies - Information and Communication Technologies (ICT)
Last update: 23 August 2022

VI-DAS Vision Inspired Driver Assistance Systems
ID: 690772
From: 1 September 2016 to: 31 August 2019
Road accidents continue to be a major public safety concern. Human error is the main cause of accidents. Intelligent driver systems that can monitor the driver’s state and behaviour show promise for our collective safety. VI-DAS will progress the design of next-gen 720°...
Coordinated in: Spain
Programme: SOCIETAL CHALLENGES - Smart, Green And Integrated Transport
Last update: 17 August 2022

Final Report Summary - FESTOS (Foresight of Evolving Security Threats Posed by Emerging Technologies)
Executive summary "FESTOS results are a very good contribution to policy and ethics discussions in the commission, FESTOS helps address challenges and threat of the future that need to be taken into account in Horizon 2020" (Ms Eva-Maria Engdahl EC DG enterprise and Industry...
Project: FESTOS (ID: 217993)
Programme: Specific Programme "Cooperation": Security
Last update: 29 March 2017

Periodic Reporting for period 1 - INNOVATE (INtelligeNt ApplicatiOns oVer Large ScAle DaTa StrEams)
Predictive analytics is the key research subject for query-driven applications. Analytics offer the necessary basis for intelligent decision making. Due to the huge volumes of data, analytics could be executed on top of data partitions. Each partition contains only a piece of...
Project: INNOVATE (ID: 745829)
Programme: EXCELLENT SCIENCE - Marie Skłodowska-Curie Actions
Last update: 15 August 2020

PROJECT

STEP2DYNA Spatial-temporal information processing for collision detection in dynamic environments
ID: 691154
From: 1 July 2016 to: 31 December 2021
In the real world, collision happens at every second - often results in serious accidents and fatalities. For example, there are more than 3560 people died from vehicle collision per day worldwide. On the other sector, autonomous unmanned aerial vehicles (UAVs) have...
Coordinated in: United Kingdom
Programme: EXCELLENT SCIENCE - Marie Skłodowska-Curie Actions, Stimulating innovation by means of cross-fertilisation of knowledge
Last update: 8 December 2023

PROJECT

Drones4Safety Inspection Drones for Ensuring Safety in Transport Infrastructures
ID: 861111
From: 1 June 2020 to: 31 May 2023
The Drones4Safety project aims to increase the safety of the European civil transport system by building a cooperative, autonomous, and continuously operating drone system that will be offered to railway and bridge operators to inspect their transportation infrastructure...
Coordinated in: Denmark
Programme: SOCIETAL CHALLENGES - Smart, Green And Integrated Transport
Last update: 15 January 2024

PROJECT

CogNet Building an Intelligent System of Insights and Action for 5G Network Management
ID: 671625
From: 1 July 2015 to: 31 December 2017
5G will realise a true Internet of Things, a network capable of supporting potentially trillions of wireless connected devices and with overall bandwidth one thousand times higher that today’s wireless networks. Current 4G technology is approaching the limits of what is...
Coordinated in: Ireland
Programme: INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies - Information and Communication Technologies (ICT), Future Internet: Software, hardware, Infrastructures, technologies and services
Last update: 8 August 2022

PROJECT

EPIC EU-Pacific Partnerships for ICT RDI
ID: 687794
From: 1 February 2017 to: 31 July 2019
The project aims to improve cooperation in the area of information and communication technologies between Europe and three partner countries in the Asia-Pacific (Australia, New Zealand, Singapore). EPIC will foster cooperation in ICT research, technology development and...
Coordinated in: Austria

Programme: INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies - Information and Communication Technologies (ICT)
Last update: 4 September 2023

Final Report Summary - HOST (High Performance Computing Service Centre)
Executive Summary:The main objective of HOST project was to improve the research capacity and reinforce the scientific and technological potential of the Research Centre in Computer Science of the West University of Timisoara in order to unlock its capacity and make it...
Project: HOST (ID: 284595)
Programme: Specific Programme "Capacities": Research potential of Convergence Regions
Last update: 17 June 2015

Final Report Summary - SESAME (Securing the European Electricity Supply Against Malicious and accidental thrEats)
Threats for the supply of electricity have changed dramatically throughout the last decade: additional to the natural and accidental ones, the new threat of malicious attacks needs to be considered. Such attacks might be jointly imparted so as to affect large...
Project: SESAME (ID: 261696)
Programme: Specific Programme "Cooperation": Security
Last update: 20 May 2015

REPORT SUMMARY
Final Report Summary - SAMURAI (Suspicious and Abnormal Behaviour Monitoring Using a Network of Cameras & Sensors for Situation Awareness Enhancement)
SAMURAI has developed and integrated an innovative intelligent surveillance system for robust monitoring of both inside and surrounding areas of a critical public infrastructure site (an airport terminal). SAMURAI has four significant novelties that make it...
Project: SAMURAI (ID: 217899)
Programme: Specific Programme "Cooperation": Security
Last update: 23 April 2015

REPORT SUMMARY
Final Report Summary - ACOMIN (Advanced Computing for Innovation)
The general objective of AComIn is to strengthen the research and innovation capacity of the Institute of Information and Communication Technologies (IICT), Bulgarian Academy of Sciences (BAS) by increasing the knowledge and skills of IICT researchers in advanced areas, by...
Project: ACOMIN (ID: 316087)
Programme: Specific Programme "Capacities": Research potential of Convergence Regions
Last update: 20 July 2016

REPORT SUMMARY
Periodic Reporting for period 1 - INNOVATE (INtelligeNt ApplicatiOns oVer Large ScAle DaTa StrEams)
Predictive analytics is the key research subject for query-driven applications. Analytics offer the necessary basis for intelligent decision making. Due to the huge volumes of data, analytics could be executed on top of data partitions. Each partition contains only a piece of...
Project: INNOVATE (ID: 745829)
Programme: EXCELLENT SCIENCE - Marie Skłodowska-Curie Actions
Last update: 15 August 2020

PROGRAMME
Awareness Inside
Awareness and consciousness have been high on the Artificial Intelligence (AI) research agenda for decades. Progress has been difficult because it has been hard to agree on exactly what it means to be aware. Most researches would agree though that we do not have any truly...
Available languages:
EN
Last update: 20 June 2022

PROJECT

AI4HEALTHSEC A Dynamic and Self-Organized Artificial Swarm Intelligence Solution for Security and Privacy Threats in Healthcare ICT Infrastructures
ID: 883273
From: 1 October 2020 to: 31 December 2023
The increasing interconnection of technology in healthcare between devices at the physical and cyber levels has transformed these infrastructures into large Health Care Information Infrastructures. Such HCIIs are considered critical and sensitive infrastructures due to their...
Coordinated in: Italy
Programme: Ensure privacy and freedom, including in the Internet and enhance the societal, legal and ethical understanding of all areas of security, risk and management, Improve cyber security, Secure societies - Protecting freedom and security of Europe and its citizens
Last update: 18 December 2023

PROJECT

Final Report Summary - CRISIS (CRitical Incident management training System using an Interactive Simulation environment)
CRISIS was conceived as a 3D immersive virtual world in which major incidents occur. Trainees are presented with a real-time evolving situation such as a train crash resulting in fires, explosions, increasing casualties and resources distributed around in a...
Project: CRISIS (ID: 242474)
Programme: Specific Programme "Cooperation": Security
Last update: 5 February 2015

ATM application-oriented Research for Artificial Intelligence (AI) for aviation
The SESAR 3 JU has identified the following innovative research elements that could be used to achieve the expected outcomes. The list is not intended to be prescriptive; proposals for work on areas other than those listed below are welcome, provided they include adequate...
Available languages:
EN
Last update: 29 June 2022

PROJECT

SPARTA Strategic programs for advanced research and technology in Europe
ID: 830892
From: 1 February 2019 to: 30 June 2022
In the domain of Cybersecurity Research and innovation, European scientists hold pioneering positions in fields such as cryptography, formal methods, or secure components. Yet this excellence on focused domains does not translate into larger-scale, system-level advantages...
Coordinated in: France
Programme: INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies - Information and Communication Technologies (ICT)
Last update: 11 September 2023

PROJECT

DORNA Development of high reliability motor drives for next generation propulsion applications
ID: 872001
From: 1 March 2020 to: 31 October 2025
This action, entitled “Development of high reliability motor drives for next generation propulsion applications”, is a 4-year research focused training program. It is aimed to form a coherent Research and Innovation Staff Exchange network so as to address technical...
Coordinated in: United Kingdom
Programme: EXCELLENT SCIENCE - Marie Skłodowska-Curie Actions, Stimulating innovation by means of cross-fertilisation of knowledge
Last update: 19 December 2023

PROJECT

SEQUOIA Robust algorithms for learning from modern data
ID: 724063
From: 1 September 2017 to: 31 August 2023

Machine learning is needed and used everywhere, from science to industry, with a growing impact on many disciplines. While first successes were due at least in part to simple supervised learning algorithms used primarily as black boxes on medium-scale problems, modern data...
Coordinated in: France
Programme: EXCELLENT SCIENCE - European Research Council (ERC)
Last update: 26 April 2022

PRISM PRobabilistic PRedictIon for Smart Mobility under stress scenarios
ID: 745673
From: 1 April 2017 to: 31 March 2019
PRISM is about designing, implementing and testing methodologies to better predict transport demand in a city. While plenty solutions exist today for this objective, there is general consensus that, under stress scenarios (e.g. large social events, inclement weather...
Coordinated in: Denmark
Programme: EXCELLENT SCIENCE - Marie Skłodowska-Curie Actions, Nurturing excellence by means of cross-border and cross-sector mobility
Last update: 15 August 2022

PROJECT

CORUS Concept of Operations for EuRopean UTM Systems
ID: 763551
From: 1 September 2017 to: 30 November 2019
The drone business sector is growing rapidly, but in Europe today is held back by the absence of a harmonized approach for the integration of drones into Very Low Level (VLL) airspace. The CORUS (Concept of Operation for EuRopean UTM Systems) project gathers experts from...
Coordinated in: Belgium
Programme: SOCIETAL CHALLENGES - Smart, Green And Integrated Transport, SESAR JU
Last update: 22 August 2022

SafePASS Next generation of life Saving appliances and systems for saFE and swift evacuation operations on high capacity PASSenger ships in extreme scenarios and conditions
ID: 815146
From: 1 September 2019 to: 31 December 2022
Evacuating a large passenger ship is a safety-critical and strictly time-bound task and a complex decision-making process based on the evolving situation and the information available. Timely evacuation requires fast and accurate evaluation of ship’s condition and estimation...
Coordinated in: Greece
Programme: SOCIETAL CHALLENGES - Smart, Green And Integrated Transport
Last update: 13 January 2023

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eDREAM eDREAM - enabling new Demand REsponse Advanced, Market oriented and Secure technologies, solutions and business models
ID: 774478
From: 1 January 2018 to: 30 June 2021
Smart automated Demand Response (DR) represents a valid alternative to grid reinforement for electricity Distribution System Operators (DSOs) to procure in a cost-effective way the necessary flexibility for integrating larger shares of intermittent RESs, while not compromising...

Shape-IT Supporting the interaction of Humans and Automated vehicles: Preparing for the EnvIronment of Tomorrow
ID: 860410
From: 1 October 2019 to: 31 March 2024
The overall goal of this ETN is to enable rapid and reliable development of safe and user-centred automated vehicles (AVs) for urban environments.Vehicle automation has been identified as a game-changer in transport, promising substantial reductions in road-traffic fatalities...
Coordinated in: Sweden
Programme: EXCELLENT SCIENCE - Marie Skłodowska-Curie Actions, Fostering new skills by means of excellent initial training of researchers

Last update: 12 December 2023

Coordinated in: Italy
Programme: SOCIETAL CHALLENGES - Secure, clean and efficient energy, A single, smart European electricity grid
Last update: 10 March 2023

PHySIS Sparse Signal Processing Technologies for HyperSpectral Imaging Systems
ID: 640174
From: 1 March 2015 to: 28 February 2017
Recent advances in the fields of electronics and optics technology have permitted the design and development of sophisticated hyperspectral imaging sensors, which are able to capture the naturally occurring imaging spectra at a very high spatial resolution forming...
Coordinated in: Greece
Programme: Enabling European competitiveness, non-dependence and innovation of the European space sector, INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies – Space
Last update: 11 August 2022

DART Data-driven AiRcraft Trajectory prediction research
ID: 699299
From: 20 June 2016 to: 19 June 2018
"DART (Data-driven AiRcraft Trajectory prediction research) addresses the topic “ER-02-2015 - Data Science in ATM” exploring the applicability of data science and complexity science techniques to the ATM domain. DART will deliver understanding on the suitability of...
Coordinated in: Greece
Programme: Exploratory Research, SOCIETAL CHALLENGES - Smart, Green And Integrated Transport
Last update: 10 August 2022

PROJECT

CREXDATA Critical Action Planning over Extreme-Scale Data
ID: 101092749
From: 1 January 2023 to: 31 December 2025
The vision of CREXDATA is to develop a generic platform for real-time critical situation management including flexible action planning and agile decision making over streaming data of extreme scale and complexity. CREXDATA develops the algorithmic apparatus, software...
Coordinated in: Greece
Programme: Digital, Industry and Space, Advanced Computing and Big Data
Last update: 25 November 2022

ILIAD INTEGRATED DigitaL Framework FOR Comprehensive MARITIME DATA AND INFORMATION SERVICES
ID: 101037643
From: 1 February 2022 to: 31 January 2025
ILIAD builds on the assets resulting from two decades of investments in policies and infrastructures for the blue economy and aims at establishing an interoperable, data-intensive, and cost-effective Digital Twin of the Ocean (DTO). It capitalizes on the explosion of new data...
Coordinated in: Belgium
Programme: SOCIETAL CHALLENGES - Food security, sustainable agriculture and forestry, marine, maritime and inland water research, and the bioeconomy
Last update: 24 January 2024

IntellIoT Intelligent, distributed, human-centered and trustworthy IoT environments
ID: 957218
From: 1 October 2020 to: 31 January 2024
The traditional cloud centric IoT has clear limitations, e.g. unreliable connectivity, privacy concerns, or high round-trip times. IntellIoT overcomes these challenges in order to enable NG IoT applications. IntellIoT’s objectives aim at developing a framework for...

Coordinated in: Germany
Programme: INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies - Information and Communication Technologies (ICT)
Last update: 27 December 2023

PROJECT

InFuse Infusing Data Fusion in Space Robotics
ID: 730014
From: 1 November 2016 to: 31 January 2019
InFuse aims to develop very essential data fusion capabilities (aka. Common Data Fusion Framework, or CDFF) that will serve in the context of many space robotics applications, on planetary surface as well as in orbit or other microgravity environments. The InFuse CDFF will be...
Coordinated in: Belgium
Programme: Enabling advances in space technology, INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies – Space, Safeguard and further develop a competitive, sustainable and entrepreneurial space industry and research community and strengthen European non-dependence in space systems, Boost innovation between space and non-space sectors
Last update: 12 August 2022

PROJECT

TED4LAT Twinning in Environmental Data and Dynamical Systems Modelling for Latvia
ID: 101079206
From: 1 October 2022 to: 30 September 2025
TED4LAT is a Coordination and Support Action proposal targeting the overarching objective of the call HORIZON-WIDERA-2021-ACCESS-03-01: Twinning to reach high international standards in research and innovation in Latvia. It will be implemented by twinning two prominent...
Coordinated in: Latvia
Programme: Twinning, Widening participation and spreading excellence
Last update: 10 March 2023

PROJECT

SERRANO TRANSPARENT APPLICATION DEPLOYMENT IN A SECURE, ACCELERATED AND COGNITIVE CLOUD CONTINUUM
ID: 101017168
From: 1 January 2021 to: 31 December 2023
SERRANO’s overall ambition is to introduce a novel ecosystem of cloud-based technologies, spanning from specialized hardware resources up to software toolsets. This will enable application-specific service instantiation and optimal customizations based on the workloads to be...
Coordinated in: Greece
Programme: INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies - Information and Communication Technologies (ICT)
Last update: 5 January 2024

PLIADES AI-Enabled Data Lifecycles Optimization and Data Spaces Integration for Increased Efficiency and Interoperability
ID: 101135988
From: 1 January 2024 to: 30 June 2027
PLIADES advances the SoA dataspaces reference architectures, towards a step change on the use of data as key enabler of technological advances in AI and Robotics. To this end, PLIADES researches into novel, AI-enabled tools to advance full data life cycles integration, both...
Coordinated in: Greece
Programme: Digital, Industry and Space, Artificial Intelligence and Robotics
Last update: 3 November 2023

OpenContinuum An Open Ecosystem for European strategic autonomy and interoperability across the computing continuum industry
ID: 101070030
From: 1 September 2022 to: 31 August 2024

OpenContinuum addresses the coordination and support of the Cloud-Edge-IoT domain, with a specific thematic focus on the supply-side of the computing continuum landscape.An integrated, open ecosystem built around Open Source, Open Standards, and the effective blending of the...
Coordinated in: Netherlands
Programme: Digital, Industry and Space, Advanced Computing and Big Data
Last update: 5 August 2022

PERFORM Pioneering the Digital Future for Omnichannel Retail Managers
ID: 765395
From: 1 January 2018 to: 31 December 2022
The overall goal of PERFORM is to establish a European training network to prepare the next generation of Digital Retail Managers. Established Business Models need to be revised as customer behaviour is changing. Customers no longer prefer online or instore purchasing but...
Coordinated in: Ireland
Programme: EXCELLENT SCIENCE - Marie Skłodowska-Curie Actions, Fostering new skills by means of excellent initial training of researchers
Last update: 10 October 2023

VICTEC Virtual ICT with Empathic Characters
ID: IST-2001-33310
From: 1 February 2002 to: 31 January 2005
VICTEC addresses the emotional and empathic aspects of the learning process, in particular focusing on Personal and Social Education (PSE). It applies a new technology embodied in a synthetic characters toolkit, suppporting the creation of believable synthetic characters in a ...
Coordinated in: United Kingdom
Programme: Programme for research, technological development and demonstration on a "User-friendly information society, 1998-2002"
Last update: 13 June 2005

INNOVATE INtelligeNt ApplicatiOns oVer Large ScAle DaTa StrEams
ID: 745829
From: 1 April 2018 to: 31 March 2020
Large scale data analytics is the key research domain for future data driven applications as numerous of devices produce huge volumes of data in the form of streams. Analytics services can offer the necessary basis for building intelligent decision making mechanisms to support...
Coordinated in: United Kingdom
Programme: EXCELLENT SCIENCE - Marie Skłodowska-Curie Actions, Nurturing excellence by means of cross-border and cross-sector mobility
Last update: 17 August 2022

PROJECT

AGENT ACADEMY AGENT ACADEMY: A Data Mining Framework for Training Intelligent Agents
ID: IST-2000-31050
From: 1 November 2001 to: 30 April 2004
Intelligent Agent technology, coupled with Data Mining and Knowledge Discovery promise to dramatically affect the way humans interact with computers. The main goal of this project is to develop Agent Academy, an integrated environment for embedding intelligence in newly create...
Coordinated in: Greece
Programme: Programme for research, technological development and demonstration on a "User-friendly information society, 1998-2002"
Last update: 27 April 2012

AI4REASON Artificial Intelligence for Large-Scale Computer-Assisted Reasoning
ID: 649043
From: 1 September 2015 to: 31 October 2020

The goal of the AI4REASON project is a breakthrough in what is considered a very hard problem in AI and automation of reasoning, namely the problem of automatically proving theorems in large and complex theories. Such complex formal theories arise in projects aimed at...
Coordinated in: Czechia
Programme: EXCELLENT SCIENCE - European Research Council (ERC)
Last update: 18 August 2022

PROJECT

AVENUE Autonomous Vehicles to Evolve to a New Urban Experience
ID: 769033
From: 1 May 2018 to: 31 October 2022
AVENUE aims to design and carry out full scale demonstrations of urban transport automation by deploying, for the first time worldwide, fleets of autonomous mini-buses in low to medium demand areas of 4 European demonstrator cities: Geneva, Lyon, Copenhagen and Luxembourg, and...
Coordinated in: Switzerland
Programme: SOCIETAL CHALLENGES - Smart, Green And Integrated Transport
Last update: 1 February 2024

PROJECT

HERON Improved Robotic Platform to perform Maintenance and Upgrading Roadworks: The HERON Approach
ID: 955356
From: 1 June 2021 to: 31 May 2025
HERON aims to develop an integrated automated system to perform maintenance and upgrading roadworks, such as sealing cracks, patching potholes, asphalt rejuvenation, autonomous replacement of CUD elements and painting markings, but also supporting the pre/post-intervention...
Coordinated in: Greece
Programme: SOCIETAL CHALLENGES - Smart, Green And Integrated Transport
Last update: 27 December 2023

PROJECT

FAITH Fostering Artificial Intelligence Trust for Humans towards the optimization of trustworthiness through large-scale pilots in critical domains
ID: 101135932
From: 1 January 2024 to: 31 December 2027
The increasing requirement for trustworthy AI systems across diverse application domains has become a pressing need not least due to the critical role that AI plays in the ongoing digital transformation addressing urgent socio-economic needs. Despite the numerous...
Coordinated in: Greece
Programme: Digital, Industry and Space, Artificial Intelligence and Robotics
Last update: 3 November 2023

PROJECT

AGILE Adoptive Gateways for dIverse muLtiple Environments
ID: 688088
From: 1 January 2016 to: 31 December 2018
AGILE project aims to create an open, flexible and widely usable IoT solution at disposal of industries (startups, SMEs, tech companies) and individuals (researchers, makers, entrepreneurs) as a framework that consists of:• A modular IoT gateway enabling various types of...
Coordinated in: Italy
Programme: INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies - Information and Communication Technologies (ICT)
Last update: 16 August 2022

PROJECT

FACE FACE: A real-time facial analysis software to improve the skincare e-commerce.
ID: 885806
From: 1 December 2019 to: 30 April 2020
FACE is the first personal real-time facial analyser capable to generate personalised therapeutic strategies and wellbeing recommendations based on the combination of artificial intelligence (AI) and medical expert algorithms. FACE software is a disruptive AI facial checker...
Coordinated in: Spain

Programme: PRIORITY 'Societal challenges, INDUSTRIAL LEADERSHIP - Innovation In SMEs, INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies
Last update: 17 August 2022

PROJECT

PerformB Innovative digital platform based on machine learning to analyze large databases, aggregate them and provide results to questions made in natural language.
ID: 832155
From: 1 November 2018 to: 28 February 2019
Inclusive and sustainable industrial development is the primary source of income generation, allows for rapid and sustained increases in living standards for all people, and provides the technological solutions to environmentally sound industrialization. Without technology and...
Coordinated in: Italy
Programme: PRIORITY 'Societal challenges, INDUSTRIAL LEADERSHIP - Innovation In SMEs, INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies
Last update: 11 August 2022

PROJECT

LICONAMCO Light-controlled nanomagnetic computation schemes
ID: 844304
From: 1 October 2019 to: 30 November 2021
Computation using nanomagnets could serve as a low-power alternative to existing CMOS technologies. Here, binary information is encoded into two stable magnetic configurations of single-domain nanomagnets. In the last ten years, significant progress has been made towards the...
Coordinated in: Spain
Programme: EXCELLENT SCIENCE - Marie Skłodowska-Curie Actions, Nurturing excellence by means of cross-border and cross-sector mobility
Last update: 19 May 2022

PROJECT

SPIKEPro SPIKING PHOTONIC-ELECTRONIC IC FOR QUICK AND EFFICIENT PROCESSING
ID: 101129904
From: 1 March 2024 to: 29 February 2028
Rapid advances in artificial intelligence technologies have led to powerful models and algorithms that have revolutionized many applications across all fields of science and technology. Deep learning performed within artificial neural networks has yielded new ways to process...
Coordinated in: Netherlands
Programme: The European Innovation Council (EIC)
Last update: 7 November 2023

PROJECT

SoMa Soft-bodied intelligence for Manipulation
ID: 645599
From: 1 May 2015 to: 30 April 2019
The main obstacle to a wide-spread adoption of advanced manipulation systems in industry is their complexity, fragility, lack of strength, and difficulty of use. This project describes a path of disruptive innovation for the development of simple, compliant, yet strong...
Coordinated in: Germany
Programme: INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies - Information and Communication Technologies (ICT), Advanced interfaces and robots: Robotics and smart spaces
Last update: 5 September 2023

ARTICONF smART socIal media eCOsytstem in a blockchaiN Federated environment
ID: 825134
From: 1 January 2019 to: 30 June 2022
Social media platforms are key technologies for next generation connectivity. Social media platforms have the potential to shape and mobilise patterns of communication, practices of exchange and business, creation, learning and knowledge acquisition. Typically, social media...
Coordinated in: Austria
Programme: INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies - Information and Communication Technologies (ICT)

Last update: 9 December 2022

PROJECT

TruBlo Trusted and reliable content on future blockchains
ID: 957228
From: 1 September 2020 to: 30 November 2023
Trust is essential to societies, and blockchain has the potential to shift trust in people and institutions to trust in technology. This view is in line with the recent emergence of less centralised paradigms for trust, that can offer concepts and techniques for efficiently...
Coordinated in: Spain
Programme: INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies - Information and Communication Technologies (ICT)
Last update: 22 January 2024

PROJECT

INGENET Networked industrial design and control applications using genetics algorithms and evolution strategies
ID: BRRT975034
From: 15 November 1997 to: 14 May 2002
INGENET NETWORK OVERVIEW The increasing complexity of design in Aeronautic, Automotive and Energy Industries requires more and more robust optimisation and control tools for solving simultaneously discrete, continuous and combinatorial difficult problems unresolved until no...
Coordinated in: France
Programme: Specific research and technological development programme in the field of industrial and materials technologies, 1994-1998
Last update: 16 March 1998

ILP Inductive Logic Programming
ID: 6020
From: 1 September 1992 to: 31 August 1995
The main long term technical goal of the ILP project is to upgrade the techniques of the classical empirical learning paradigm to a logic programming framework. In this way ILP aims to overcome the two main limitations of classical empirical or similarity based learning algori...
Coordinated in: Belgium
Programme: Specific research and technological development programme (EEC) in the field of information technologies, 1990-1994
Last update: 5 April 2023

PROJECT

MASLOG Formal methods for multi-agents systems
ID: 21669
From: 1 August 2006 to: 31 January 2008
The multi-agent paradigm is emerging as a promising new programming approach with the goal of providing computing and communication services to the user on the basis of autonomous component-based processes. One of the major challenges in the multi-agent systems (MAS) area conc...
Coordinated in: France
Programme: Human resources and Mobility in the specific programme for research, technological development and demonstration "Structuring the European Research Area" under the Sixth Framework Programme 2002-2006
Last update: 5 April 2023

PROJECT

SafeOPS From Prediction to Decision Support - Strengthening Safe and Scalable ATM Services through Automated Risk Analytics based on Operational Data from Aviation Stakeholders
ID: 892919
From: 1 January 2021 to: 31 December 2022
Maintaining safety and cost-efficiency of air transport operations while increasing the capacity will push the next generation of ATM systems towards digitalization. In the mid-term, a digitalized system in the human operated ATM environment will be capable of delivering...
Coordinated in: Germany
Programme: SOCIETAL CHALLENGES - Smart, Green And Integrated Transport, SESAR JU
Last update: 4 July 2023

AERO-TRAIN AErial RObotic TRAINing for the next generation of European infrastructure and asset maintenance technologies
ID: 953454
From: 1 January 2021 to: 31 December 2024
AERO-TRAIN fills gaps between the infrastructure O&M industry and Industry4.0 with the ambition to keep our invaluable assets operational and safe. The AERO-TRAIN general objectives are, in fact, to reduce the costs associated to O&M operations, while increasing the safety...
Coordinated in: Denmark
Programme: EXCELLENT SCIENCE - Marie Skłodowska-Curie Actions, Fostering new skills by means of excellent initial training of researchers
Last update: 27 December 2023

CERENA Developing Intelligent Personal Service Environments
ID: IST-1999-10039
From: 1 January 2000 to: 31 December 2001
Relationship marketing is mostly used as a paradigm to support interaction between individuals and organisations, most prominently manifested in traditional retailing business via so-called "loyalty" cards. These methods do not always meet the needs of the individual and the o...
Coordinated in: Germany
Programme: Programme for research, technological development and demonstration on a "User-friendly information society, 1998-2002"
Last update: 13 June 2005

PROJECT

RECIPE REliable power and time-ConstraInts-aware Predictive management of heterogeneous Exascale systems
ID: 801137
From: 1 May 2018 to: 31 October 2021
The current HPC facilities will need to grow by an order of magnitude in the next few years to reach the Exascale range. The dedicated middleware needed to manage the enormous complexity of future HPC centers, where deep heterogeneity is needed to handle the wide variety of...
Coordinated in: Italy
Programme: EXCELLENT SCIENCE - Future and Emerging Technologies (FET), FET Proactive
Last update: 10 September 2022

PROJECT

Dispatcher3 Innovative processing for flight practices
ID: 886461
From: 1 June 2020 to: 30 November 2022
"Dispatcher3 will develop a software prototype for the acquisition and preparation of historical flight data in order to give support to the optimisation of future flights providing predictive capabilities and advice to dispatchers and pilots. This will be done considering...
Coordinated in: United Kingdom
Programme: SOCIETAL CHALLENGES - Smart, Green And Integrated Transport, ITD Systems
Last update: 18 December 2023

PROJECT

Fed4FIREplus Federation for FIRE Plus
ID: 732638
From: 1 January 2017 to: 30 June 2022
The Fed4FIRE+ project has the objective to run and further improve Fed4FIRE’s “best-in-town” federation of experimentation facilities for the Future Internet Research and Experimentation initiative. Federating a heterogeneous set of facilities covering technologies...
Coordinated in: Belgium
Programme: INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies - Information and Communication Technologies (ICT)
Last update: 5 February 2024

PROJECT

ID: 715872
From: 1 March 2017 to: 31 August 2023
Cognitive tasks are increasingly necessary in modern electronics. The energy efficiency of associated algorithms, which rely on abundant stored parameters, is severely limited by the separation of computation and memory elements in conventional computers. In NANOINFER, I will...
Coordinated in: France
Programme: EXCELLENT SCIENCE - European Research Council (ERC)
Last update: 23 August 2022

PROJECT

GAMMA-MRI gamma-MRI: the future of molecular imaging
ID: 964644
From: 1 April 2021 to: 30 September 2024
Gamma-MRI will develop a clinical molecular imaging device based on the physical principle of anisotropic gamma emission from hyperpolarised metastable xenon. In the strategic move from “one size fits all” to personalised medicine, molecular imaging plays an essential...
Coordinated in: Switzerland
Programme: EXCELLENT SCIENCE - Future and Emerging Technologies (FET), FET Open
Last update: 2 January 2024

PROJECT

OPRECOMP Open transPREcision COMPuting
ID: 732631
From: 1 January 2017 to: 31 December 2020
Guaranteed numerical precision of each elementary step in a complex computation has been the mainstay of traditional computing systems for many years. This era, fueled by Moore's law and the constant exponential improvement in computing efficiency, is at its twilight: from...
Coordinated in: Switzerland
Programme: EXCELLENT SCIENCE - Future and Emerging Technologies (FET), FET Proactive
Last update: 23 August 2022

FISHY A coordinated framework for cyber resilient supply chain systems over complex ICT infrastructures
ID: 952644
From: 1 September 2020 to: 31 August 2023
Project FISHY aims at designing, developing, validating and demonstrating a coordinated framework for cyber resilience provisioning to guarantee a trusted supply chain of ICT systems, built upon distributed, dynamic, and often fundamentally insecure and heterogeneous ICT...
Coordinated in: Spain
Programme: INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies - Information and Communication Technologies (ICT)
Last update: 28 December 2023

PROJECT

TRAINSFARE SMART TOOL TO PROTECT PUBLIC TRANSPORT REVENUES, ASSETS, PASSENGERS AND MOBILITY
ID: 767807
From: 1 May 2017 to: 31 October 2020
TRAINSFARE’s main objective is to help reduce fare evasion on public transport, which causes revenue losses in excess of €2.9bn/year in Europe alone. To tackle fare evasion public transport operators use random ticket inspections with variable success. This method...
Coordinated in: Spain
Programme: SOCIETAL CHALLENGES - Smart, Green And Integrated Transport, INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies - Information and Communication Technologies (ICT), Mainstreaming SME support, especially through a dedicated instrument
Last update: 18 August 2022

COMPULOG Computational Logic
ID: 1667
From: 1 April 1989 to: 31 March 1992

This Action aimed to develop the foundations of an integrated logic-based software environment for developing knowledge-rich applications. Such an environment should include a language suitable for databases, programming and problem-solving together with logic-based tools for ...
Coordinated in: United Kingdom
Programme: European strategic programme (EEC) for research and development in information technologies (ESPRIT), 1987-1992
Last update: 5 April 2023

PROJECT

SWIFT SPECIFICATION FOR WORKING POSITIONS IN FUTURE AIR TRAFFIC CONTROL
ID: 81011501
From: 1 March 1992 to: 1 September 1994
This project will combine medium and long term operational evolutionary definition and technical studies, in order to design the future control suite and its basic component, the CWPs.
Coordinated in: France
Programme: Specific research and technological development programme (EEC) in the field of transport (EURET), 1990-1993
Last update: 18 November 1992

PROJECT

WAI-Tools Advanced Decision Support Tools for Scalable Web Accessibility Assessments
ID: 780057
From: 1 November 2017 to: 31 January 2021
WAI-Tools, Advanced Decision Support Tools for Scalable Web Accessibility Assessments, drives innovation with sustainable impact on the entire field of web accessibility evaluation and repair through:• Building on the on-going international standardisation efforts on web...
Coordinated in: France
Programme: INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies - Information and Communication Technologies (ICT)
Last update: 22 August 2022

PROJECT

TANGO Digital Technologies ActiNg as a Gatekeeper to information and data flOws
ID: 101070052
From: 1 September 2022 to: 31 August 2025
TANGO will establish a stronger cross-sector data sharing, in a citizen-centric, secure and trustworthy manner, by developing innovative solutions while addressing environmental degradation and climate change challenges. The overall outcome is a novel platform exhibiting the...
Coordinated in: Spain
Programme: Digital, Industry and Space, Advanced Computing and Big Data
Last update: 13 September 2022

PROJECT

Safe-DEED Safe Data Enabled Economic Development
ID: 825225
From: 1 December 2018 to: 30 November 2021
As privacy and trust remain key in the data sharing debate, Privacy enhancing technologies (PET) will play a prominent role by 2025. Safe-DEED takes a highly interdisciplinary approach, bringing together partners from cryptography, data science, business innovation, and legal...
Coordinated in: Austria
Programme: INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies - Information and Communication Technologies (ICT)
Last update: 26 July 2022

PROJECT

MASTER Multiple ASpects TrajEctoRy management and analysis
ID: 777695
From: 1 March 2018 to: 31 December 2023
An ever-increasing number of diverse, real-life applications, ranging from mobile phone calls to social media and land, sea, and air surveillance systems, produce massive amounts of spatio-temporal data representing trajectories of moving objects. Trajectories, commonly...

Coordinated in: Italy
Programme: EXCELLENT SCIENCE - Marie Skłodowska-Curie Actions, Stimulating innovation by means of cross-fertilisation of knowledge
Last update: 8 December 2023

PROJECT

VISIONS Neural Video Processing and Streaming for Real-time Traffic Monitoring
ID: 898588
From: 1 August 2021 to: 31 July 2023
With the rapid development of urbanization and continuous increase of vehicles on roadways, Intelligent Transportation Systems (ITS) play a key role in revolutionizing the way people commute. To make our cities safer and smarter, real-time traffic monitoring systems are...
Coordinated in: United Kingdom
Programme: EXCELLENT SCIENCE - Marie Skłodowska-Curie Actions, Nurturing excellence by means of cross-border and cross-sector mobility
Last update: 28 December 2023

I-VALVE INTELLIGENT VALVE FOR PERSONALIZED SAFETY AIRBAG
ID: 763024
From: 1 February 2017 to: 31 July 2017
According with the World Health organization(WHO) every year the lives of approximately 1.25 million people are cut short as a result of a road traffic crash. Between 20 and 50 million more people suffer non-fatal injuries, with many incurring a disability as a result of their...
Coordinated in: Spain
Programme: SOCIETAL CHALLENGES - Smart, Green And Integrated Transport, INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies - Information and Communication Technologies (ICT), Mainstreaming SME support, especially through a dedicated instrument
Last update: 11 August 2022

PROJECT

Intranetum Disrupting the Way We Store and Search for Files, Replacing The Folder-Based With a Context-Based Filing Paradigm.
ID: 743997
From: 1 January 2017 to: 30 June 2017
Knowledge workers such as lawyers or software engineers spend 16% of their time searching for information. Over 50% of the times, they do not find exactly what they are looking for. A lot of this time is wasted by employees using solutions that ask “where” the information...
Coordinated in: Spain
Programme: INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies - Information and Communication Technologies (ICT), Mainstreaming SME support, especially through a dedicated instrument
Last update: 5 August 2022

PROCONTRA Smart-Contract Protocols: Theory for Applications
ID: 885666
From: 1 January 2021 to: 31 December 2025
Smart contracts are formal agreements that take the form of computer programs. They are typically written down, and automatically executed, on blockchains. Smart-contract protocols are algorithms that describe how these contracts operate in multiparty settings. Due to the...
Coordinated in: Poland
Programme: EXCELLENT SCIENCE - European Research Council (ERC)
Last update: 13 June 2023

PROJECT

SPINAPSE Creating complexity: toward atomic spin-based neural hardware
ID: 818399
From: 1 March 2019 to: 28 February 2025

The growing trend in global electricity consumption has created a new challenge for materials-based science: to find computational paradigms toward ICT that are not only smaller and faster, but also energy-efficient. A new source of inspiration is the human brain, which...
Coordinated in: Netherlands
Programme: EXCELLENT SCIENCE - European Research Council (ERC)
Last update: 31 December 2022

PROJECT

MICS Multiphoton imaging with computational specificity
ID: 101103200
From: 1 June 2023 to: 31 May 2025
Digital staining based on machine learning models can provide cellular specificity to label-free optical imaging. This concept is particularly interesting for in vivo applications in fundamental research of auto-immune diseases as well as for future clinical translations. In...
Coordinated in: Germany
Programme: Marie Skłodowska-Curie Actions (MSCA)
Last update: 28 June 2023

PROJECT

LEMUR Learning with Multiple Representations
ID: 101073307
From: 1 January 2023 to: 31 December 2026
Machine learning methods operate on formal representations of the data at hand and the models or patterns induced from the data. They also assume a suitable formalization of the learning task itself (e.g., as a classification problem), including a specification of the...
Coordinated in: Germany
Programme: Marie Skłodowska-Curie Actions (MSCA)
Last update: 4 September 2022

PROJECT

HiEFFICIENT Highly EFFICIENT and reliable electric drivetrains based on modular, intelligent and highly integrated wide band gap power electronics modules
ID: 101007281
From: 1 May 2021 to: 31 October 2024
The European “Green Deal” initiative by the EU commission strives for sustainable mobility and efficient use of resources. Within HiEFFICIENT the project partners will work towards these goals and will develop the next generation of wide band-gap semiconductors (WBG) in...
Coordinated in: Austria
Programme: ECSEL, INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies - Information and Communication Technologies (ICT)
Last update: 22 January 2024

5G-VINNI 5G Verticals INNovation Infrastructure
ID: 815279
From: 1 July 2018 to: 31 December 2021
5G-VINNI will accelerate the uptake of 5G in Europe by providing an end-to-end (E2E) facility that validates the performance of new 5G technologies by operating trials of advanced vertical sector services. The 5G-VINNI strategy to achieve this involves: (1) Designing the most...
Coordinated in: Norway
Programme: INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies - Information and Communication Technologies (ICT)
Last update: 11 December 2023

PROJECT

capito Making information understandable for everyone
ID: 190167125
From: 1 March 2022 to: 31 January 2024
CFS Consulting, Franchise & Sales GmbH, founded as a role model for combining social impact and entrepreneurship, is specialised in language simplification and accessible information.Our leading brand capito creates a disruptive AI-based text simplification system, which...

Coordinated in: Austria
Programme: The Accelerator, The European Innovation Council (EIC)
Last update: 24 August 2022

PROJECT

PriMO-5G Virtual Presence in Moving Objects through 5G
ID: 815191
From: 1 July 2018 to: 30 June 2021
The PriMO-5G project addresses the area of “a) Focus on mmWave and super broadband services” in the call “EUK-02-2018: 5G” of the Horizon 2020 Work Program 2018-2020. The main aim of the PriMO-5G project is to demonstrate an end-to-end 5G system providing immersive...
Coordinated in: Finland
Programme: INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies - Information and Communication Technologies (ICT)
Last update: 28 September 2022

OEMC Open-Earth-Monitor Cyberinfrastructure
ID: 101059548
From: 1 June 2022 to: 31 May 2026
The Open-Earth-Monitor Cyberinfrastructure will increase European capability to generate timely, accurate, disaggregated, people-centred, accessible (GSM-compatible) and user-friendly environmental information based on Earth Observation data. We will achieve this by building a...
Coordinated in: Netherlands
Programme: Food, Bioeconomy Natural Resources, Agriculture and Environment, Environmental Observation
Last update: 4 September 2022

NECOS Novel Enablers for Cloud Slicing
ID: 777067
From: 1 November 2017 to: 31 October 2019
The NECOS project addresses the limitations of current cloud computing infrastructures to respond to the demand of new services, as presented in two use-cases that will drive the whole execution of the project. The first use-case is Telco service provider focussed and is...
Coordinated in: Spain
Programme: INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies - Information and Communication Technologies (ICT)
Last update: 17 August 2022

FACILE FAST AND ACCURATE CATEGORISATION OF INFORMATION BY LANGUAGE ENGINEERING
ID: LE12440
From: 1 December 1995 to: 30 November 1997
FACILE focuses on a pilot system to handle message dispatching and routing of texts within financial establishments, such as banks or trading companies. The system, which integrates shallow and deep text analysis techniques, supported by a rich domain model and a powerful pre-...
Coordinated in: Italy
Programme: Specific programme of research and technological development and demonstration in the area of telematic applications of common interest, 1994-1998
Last update: 20 August 1999

FlexNets Quantifying Flexibility in Communication Networks
ID: 647158
From: 1 September 2015 to: 28 February 2021
Communication networks have emerged to become the basic infrastructure for all areas of our society with application areas ranging from social media to industrial production and healthcare. New requirements include the need for dynamic changes of the required resources, for...
Coordinated in: Germany
Programme: EXCELLENT SCIENCE - European Research Council (ERC)

Last update: 22 August 2022

PROJECT

Algorithmic tools for efficient scheduling in parallel computing environments
ID: FMBI950161
From: 15 January 1996 to: 14 January 1997
The objective of this project is to develop a set of efficient techniques and algorithmic tools for scheduling in parallel systems, towards a general purpose use of parallel computing. An integrated approach is proposed that incorporate three crucial factors affecting the k...
Coordinated in: Greece
Programme: Specific research and technological development programme in the field of the training and mobility of researchers, 1994-1998
Last update: 3 May 1996

PROJECT

SPIRIT The Spirit Workstation
ID: 2484
From: 5 December 1988 to: 4 December 1992
The SPIRIT workstation project aims to design and build a high-performance technical workstation to support computationally demanding activities in computer-aided engineering, image processing, graphical interaction, knowledge-based systems, modelling and simulation, and the d...
Coordinated in: Germany
Programme: European strategic programme (EEC) for research and development in information technologies (ESPRIT), 1987-1992
Last update: 17 June 1994

PANDA Collaborative Process Automation Support using Service Level Agreements and Intelligent dynamic Agents in SME clusters
ID: 027169
From: 1 January 2006 to: 30 June 2008
PANDA aims to speed up the integration process in the European ERP/CRM industry, by developing an advanced set of conceptual components and e-services dedicated to: (i) address current inefficiencies in the ERP/CRM value chain (ERP/CRM vendors, national representatives, consul...
Coordinated in: Greece
Programme: Information Society Technologies: thematic priority under the specific programme "Integrating and strengthening the European research area" (2002-2006).
Last update: 2 May 2007

ANNEX V:
SUCCESSFUL AI-ENABLED PROJECTS ON ETHICAL, LEGAL AND SOCIAL DISCIPLINES

MAIA Multifunctional, adaptive and interactive AI system for Acting in multiple contexts
ID: 951910
From: 1 January 2021 to: 30 June 2025
What if in a near future Artificial Intelligence (AI) becomes human-centric, focusing on human needs and build trustworthiness by mutual understanding? Today, millions of people worldwide suffer from deteriorated motor abilities, due to stroke, brain tumor surgery or accident...
Coordinated in: Italy
Programme: EXCELLENT SCIENCE - Future and Emerging Technologies (FET), FET Proactive
Last update: 22 January 2024

WeNet WeNet - The Internet of US
ID: 823783
From: 1 January 2019 to: 30 June 2023
"Diversity permeates our everyday life and covers many dimensions, such as competence, culture, gender or economic across humans and social relations. Technology has evolved to a point where humans from diverse backgrounds, cultures, and experiences have an unprecedented...
Coordinated in: Italy
Programme: EXCELLENT SCIENCE - Future and Emerging Technologies (FET), FET Proactive
Last update: 2 January 2024

TAILOR Foundations of Trustworthy AI - Integrating Reasoning, Learning and Optimization
ID: 952215
From: 1 September 2020 to: 31 August 2024
Artificial Intelligence (AI) and all the key digital technologies that are subsumed by the term AI today are an essential part of the answers to many of the daunting challenges that we are facing. AI will impact the everyday lives of citizens as well as all business sectors...
Coordinated in: Sweden
Programme: INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies - Information and Communication Technologies (ICT)
Last update: 5 February 2024

TRUST-AI Transparent, Reliable and Unbiased Smart Tool for AI
ID: 952060
From: 1 October 2020 to: 31 March 2025
Artificial intelligence is single-handedly changing decision-making at different levels and sectors in often unpredictable and uncontrolled ways. Due to their black-box nature, existing models are difficult to interpret, and hence trust. Explainable AI is an emergent field...
Coordinated in: Portugal
Programme: EXCELLENT SCIENCE - Future and Emerging Technologies (FET), FET Proactive
Last update: 15 January 2024

PROJECT

AutoFair Human-Compatible Artificial Intelligence with Guarantees
ID: 101070568
From: 1 October 2022 to: 30 September 2025

In this proposal, we address the matter of transparency and explainability of AI using approaches inspired by control theory. Notably, we consider a comprehensive and flexible certification of properties of AI pipelines, certain closed-loops and more complicated...
Coordinated in: Czechia
Programme: Digital, Industry and Space, Artificial Intelligence and Robotics
Last update: 4 September 2022

Periodic Reporting for period 1 - NL4XAI (Interactive Natural Language Technology for Explainable Artificial Intelligence)
The aim of this four-year European project is to use natural language to generate explanations for decisions made by an Artificial Intelligence (AI) system, which are understandable to non-expert users.According to Polanyi's paradox, humans know more than they can explain...
Project: NL4XAI (ID: 860621)
Programme: EXCELLENT SCIENCE - Marie Skłodowska-Curie Actions
Last update: 2 March 2022

INTENT Intelligent Instruments: Understanding 21st-Century AI Through Creative Music Technologies
ID: 101001848
From: 1 September 2021 to: 31 August 2026
Artificial Intelligence is becoming increasingly human-like and it is now proficient in a key human activity: musical creativity. But what does this mean? How does creative AI change our notions of art, culture and society? As new machine learning technologies begin to mirror...
Coordinated in: Iceland
Programme: EXCELLENT SCIENCE - European Research Council (ERC)
Last update: 19 August 2022

Periodic Reporting for period 1 - AIRE (Artificial Intelligence for Recruitment Europe)
AIRE – Artificial Intelligence for Recruiting Europe introduces a world 1st personal robot (AIREbot) to help every European citizen apply for jobs, update their skills, register for courses and arrange interviews. The project has demonstrated that it can Reduce EU vacancies...
Project: AIRE (ID: 782921)
Programme: SOCIETAL CHALLENGES - Europe In A Changing World - Inclusive, Innovative And Reflective Societies
Last update: 7 June 2018

REPORT SUMMARY

AI4LABOUR Reshaping labour force participation with Artificial Intelligence
ID: 101007961
From: 1 November 2021 to: 31 October 2025
In the last decade, due to the tremendous progress of computing power, a new era which is called Industry 4.0 has been triggered. This new revolutionary progress in manufacturing systems will also create a huge impact on the socio-economic dynamics of society. Moreover, very...
Coordinated in: Türkiye
Programme: EXCELLENT SCIENCE - Marie Skłodowska-Curie Actions, Stimulating innovation by means of cross-fertilisation of knowledge
Last update: 5 February 2024

Improved knowledge graphs key to working with artificial intelligence data more efficiently
Project: ENEXA (ID: 101070305)
Programme: Digital, Industry and Space
Available languages:
DEENESFRITPL
Last update: 21 November 2022
Programme: Specific Programme "Cooperation": Nanosciences, Nanotechnologies, Materials and new Production Technologies
Last update: 18 December 2017

REPORT SUMMARY

Final Report Summary - LEILA (Law Enforcement Intelligence Learning Application)
The LEILA project aims to provide law enforcement organizations with an innovative learning methodology through the development of engaging learning experiences and gaming solutions designed specifically for the learning needs of the civil security intelligence analysis...
Project: LEILA (ID: 608303)
Programme: Specific Programme "Cooperation": Security
Last update: 7 April 2017

CoHuBiCoL Counting as a Human Being in the Era of Computational Law
ID: 788734
From: 1 January 2019 to: 31 December 2023
This project will investigate how the prominence of counting and computation transforms many of the assumptions, operations and outcomes of the law. It targets two types of computational law: artificial legal intelligence or data-driven law (based on machine learning), and...
Coordinated in: Belgium
Programme: EXCELLENT SCIENCE - European Research Council (ERC)
Last update: 10 March 2023

REPORT SUMMARY

Final Report Summary - TEPSIE (The theoretical, empirical and policy foundations for building social innovation in Europe)
The field of social innovation is developing rapidly all over the world, with new institutions, methods and activities. More systematic innovation methods are being applied to some of the most challenging social problems of our times: climate change, chronic...
Project: TEPSIE (ID: 290771)
Programme: Specific Programme "Cooperation": Socio-economic Sciences and Humanities
Last update: 2 December 2015

REPORT SUMMARY

Final Report Summary - SISOB (An Observatorium for Science in Society based in Social Models)
Executive Summary:The SiSOB (An Observatorium for Science in Society based on Social Models) project was a three-year EU project that was conducted from January 2011 to December 2013 (36 months). The project brought together seven universities and research centresfrom Europe...
Project: SISOB (ID: 266588)
Programme: Specific Programme "Capacities": Science in society
Last update: 20 January 2015

PROJECT

Final Report Summary - FESTOS (Foresight of Evolving Security Threats Posed by Emerging Technologies)
Executive summary "FESTOS results are a very good contribution to policy and ethics discussions in the commission, FESTOS helps address challenges and threat of the future that need to be taken into account in Horizon 2020" (Ms Eva-Maria Engdahl EC DG enterprise and Industry...
Project: FESTOS (ID: 217993)
Programme: Specific Programme "Cooperation": Security
Last update: 29 March 2017

Periodic Reporting for period 1 - GuestXR (GuestXR: A Machine Learning Agent for Social Harmony in eXtended Reality)
Immersive social spaces will soon become ubiquitous. However, there is also a warning to heed from social media.User content is the ‘lifeblood of social media’.However, it often stimulates antisocial interaction and abuse, ultimately posing a danger to vulnerable people.In...
Project: GuestXR (ID: 101017884)
Programme: EXCELLENT SCIENCE - Future and Emerging Technologies (FET)
Last update: 4 July 2023

REPORT SUMMARY

ID: 826506
From: 1 January 2019 to: 30 June 2022

"sustAGE aims to develop a person-centered solution for promoting the concept of ""sustainable work"" for EU industries. The project provides a paradigm shift in human machine interaction, building upon seven strategic technology trends, IoT, Machine learning, micro-moments...
Coordinated in: Greece
Programme: SOCIETAL CHALLENGES - Health, demographic change and well-being, Active ageing, independent and assisted living, Individual awareness and empowerment for self-management of health
Last update: 28 December 2022

PROJECT

ACES Autopoietic Cognitive Edge-cloud Services
ID: 101093126
From: 1 January 2023 to: 31 December 2025
The increasing need for cloud services at the edge (edge–services) is caused by the rapidly growing quantity and capabilities of connected and interacting edge devices exchanging vast amounts of data. This poses different challenges to cloud computing architectures at the...
Coordinated in: Portugal
Programme: Digital, Industry and Space, Advanced Computing and Big Data
Last update: 13 December 2022

PROJECT

MIRROR Migration-Related Risks caused by misconceptions of Opportunities and Requirement
ID: 832921
From: 1 June 2019 to: 31 May 2022
The perception of Europe and individual European countries has a high impact on expectations and decisions of citizens from outside Europe (considering) coming to Europe, especially from countries of origin (COO) for migration. Misperceptions and targeted misinformation...
Coordinated in: Germany
Programme: Secure societies - Protecting freedom and security of Europe and its citizens, Strengthen security through border management, Support the Union's external security policies including through conflict prevention and peace-building
Last update: 10 March 2023

L2TOR Second Language Tutoring using Social Robots
ID: 688014
From: 1 January 2016 to: 31 December 2018
The L2TOR project capitalises on recent developments in human-robot interaction in which the use of social robots is explored in the context of teaching and tutoring. Social robots have been shown to have marked benefits over screen-based tutoring technologies, and have...
Coordinated in: United Kingdom
Programme: INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies - Information and Communication Technologies (ICT)
Last update: 15 August 2022

PROJECT

MICS Developing metrics and instruments to evaluate citizen science impacts on the environment and society
ID: 824711
From: 1 January 2019 to: 31 July 2022
THE MICS project brings together a transdisciplinary team to address a scientific and policy priority area where citizen science has the potential to promote a paradigm shift. Nature-based solutions (NBSs) are actions to protect, sustainably manage and restore natural or...
Coordinated in: United Kingdom
Programme: Integrate society in science and innovation issues, policies and activities in order to integrate citizens' interests and values and to increase the quality, relevance, social acceptability and sustainability of research and innovation outcomes in various fields of activity from social innovation to areas such as biotechnology and nanotechnology
Last update: 22 January 2023

PROJECT

SPECIAL Scalable Policy-awarE linked data arChitecture for prIvacy, trAnsparency and compLiance
ID: 731601

From: 1 January 2017 to: 31 December 2019
The SPECIAL project will address the contradiction between Big Data innovation and privacy-aware data protection by proposing a technical solution that makes both of these goals realistic. We will develop technology that: (i) supports the acquisition of user consent at...
Coordinated in: France
Programme: INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies - Information and Communication Technologies (ICT)
Last update: 18 August 2022

PROJECT

CAROLINE Collaborative Research Fellowships for a Responsive and Innovative Europe
ID: 713279
From: 2 June 2016 to: 1 June 2022
The CAROLINE Fellowship Programme proposed by the Irish Research Council (IRC) will provide a unique opportunity for researchers to further develop their skills, competencies and experience through inter-sectoral collaboration with NGOs and International Organisations (IO)...
Coordinated in: Ireland
Programme: Increasing structural impact by co-funding activities, EXCELLENT SCIENCE - Marie Skłodowska-Curie Actions
Last update: 1 February 2024

PROJECT

GATE BiG DAta for SmarT SociEty
ID: 857155
From: 1 September 2019 to: 31 August 2026
GATE aims to establish a “BiG DAta for SmarT SociEty” Center of Excellence in Bulgaria, in order to provide focus for increased scientific excellence and sustained Big Data growth, through attractive and stimulating research environment, advanced infrastructure supporting...
Coordinated in: Bulgaria
Programme: Teaming of excellent research institutions and low performing RDI regions
Last update: 25 May 2022

PROJECT

DRA The 'Vanishing Third Party': Access to Justice, Procedural Justice and Substantive Justice in the Age of Dispute Resolution Automation
ID: 101044195
From: 1 March 2023 to: 29 February 2028
Courts without judges? Informal processes without mediators? We are on the verge of a dramatic paradigm shift in our justice system from human to algorithmic dispute resolution. While most of us perceive the delivery of justice as a human task, courts and informal arenas...
Coordinated in: Israel
Programme: European Research Council (ERC)
Last update: 13 January 2023

PROJECT

WEKIT Wearable Experience for Knowledge Intensive Training
ID: 687669
From: 1 December 2015 to: 28 February 2019
OBJECTIVES: Build on multi-discipline research (e.g., human-centred methodology integrates cognitive models, ergonomics, understanding of worker’s well being) to accelerate how we identify, acquire and exploit skills valued by industry. Get high take-up by early adopters...
Coordinated in: Italy
Programme: INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies - Information and Communication Technologies (ICT)
Last update: 16 August 2022

PROJECT

Explanation in Online Help and Offline Training Based on Continuous Simulation
ID: BRPR950049
From: 1 January 1996 to: 31 December 1998

The main outcomes of the research activities of the EXTRAS project are the generic knowledge framework, and an extensive amount of the software produced which has allowed further steps in developing explanation systems. Explanation systems that are quite difficult, if not imp...
Coordinated in: United Kingdom
Programme: Specific research and technological development programme in the field of industrial and materials technologies, 1994-1998
Last update: 21 October 1999

PROJECT

CAVAA Counterfactual Assessment and Valuation for Awareness Architecture
ID: 101071178
From: 1 October 2022 to: 30 September 2026
The Counterfactual Assessment and Valuation for Awareness Architecture (CAVAA) project proposes that awareness serves survival in a world governed by hidden states, to deal with the “invisible”, from unexplored environments to social interaction that depends on the...
Coordinated in: Netherlands
Programme: The European Innovation Council (EIC)
Last update: 23 August 2022

PROJECT

FashionBrain Understanding Europe’s Fashion Data Universe
ID: 732328
From: 1 January 2017 to: 31 December 2019
The primary goal of each retailer is to “understand your customers”. Our interviews with retailers show a primary demand from the retail industry for predicting a customer's next demand. Surprisingly , even a complete record of past purchases (and returns) is not...
Coordinated in: United Kingdom
Programme: INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies - Information and Communication Technologies (ICT)
Last update: 17 August 2022

PROJECT

AGERISK Neurocomputational mechanisms underlying age-related performance changes in goal-directed decisions from experience
ID: 708507
From: 1 September 2016 to: 2 March 2019
The ability to make goal-directed decisions concerning one’s general well-being declines in later life. The primary—and potentially improvable—factor impacting this decline in decision-making performance is the learning process that precedes a decision. However, little...
Coordinated in: Germany
Programme: EXCELLENT SCIENCE - Marie Skłodowska-Curie Actions, Nurturing excellence by means of cross-border and cross-sector mobility
Last update: 11 August 2022

PROJECT

CLOTHILDE CLOTH manIpulation Learning from DEmonstrations
ID: 741930
From: 1 January 2018 to: 31 December 2023
Textile objects pervade human environments and their versatile manipulation by robots would open up a whole range ofpossibilities, from increasing the autonomy of elderly and disabled people, housekeeping and hospital logistics, to novelautomation in the clothing internet...
Coordinated in: Spain
Programme: EXCELLENT SCIENCE - European Research Council (ERC)
Last update: 8 December 2023

ROXANNE Real time network, text, and speaker analytics for combating organized crime
ID: 833635
From: 1 September 2019 to: 31 December 2022
Discovering criminal networks and identifying their members is one of the primary aspects of LEAs' mission. ROXANNE will contribute towards this goal by bridging the strengths of speech and language technologies (SLTs), visual analysis (VA) and network analysis (NA). If...

Coordinated in: Switzerland
Programme: Secure societies - Protecting freedom and security of Europe and its citizens, Fight crime, illegal trafficking and terrorism, including understanding and tackling terrorist ideas and beliefs, Support the Union's external security policies including through conflict prevention and peace-building
Last update: 11 December 2023

PROJECT

E2-CREATE E2-CREATE: Encoding Embodied CreativityVisual arts, performing arts, film, design
ID: 840465
From: 6 April 2020 to: 13 September 2022
Choreography is an art form well-known for combining rigorous physical and mental training with the highest degrees of creativity. However, as dance is the most ephemeral of art forms, this extraordinary embodied creativity has been in danger of disappearing without leaving a...
Coordinated in: United Kingdom
Programme: EXCELLENT SCIENCE - Marie Skłodowska-Curie Actions, Nurturing excellence by means of cross-border and cross-sector mobility
Last update: 12 December 2023

PROJECT

iTalk2Learn Talk, Tutor, Explore, Learn: Intelligent Tutoring and Exploration for Robust Learning
ID: 318051
From: 1 November 2012 to: 31 October 2015
In the aftermath of the PISA studies, which identified weaknesses of students in many European countries, especially in mathematics, the education of children in the elementary school grades has received a lot of attention. Yet, most learning systems that have been developed ...
Coordinated in: Germany
Programme: Specific Programme "Cooperation": Information and communication technologies
Last update: 22 April 2017

PROJECT

INNOVA MEASURE IV Econometric analyses and indicators on Research, Excellence and Impact of Research and Innovation
ID: 857088
From: 1 May 2019 to: 31 October 2020
The INNOVA MEASURE IV project continues the research activity carried out by the JRC in support of the work on better evidence for policy-making by the Directorate-General for Research & Innovation. It builds on the outcomes and capacities developed within the framework of the...
Coordinated in: Belgium
Programme: SOCIETAL CHALLENGES - Europe In A Changing World - Inclusive, Innovative And Reflective Societies, Innovative societies
Last update: 18 August 2022

PROJECT

ACANTO ACANTO: A CyberphysicAl social NeTwOrk using robot friends
ID: 643644
From: 1 February 2015 to: 31 July 2018
"Despite its recognised benefits, most older adults do not engage in a regular physical activity. The ACANTO project proposes a friendly robot walker (the FriWalk) that will abate a some of the most important barriers to this healthy behaviour.The FriWalk revisits the notion...
Coordinated in: Italy
Programme: SOCIETAL CHALLENGES - Health, demographic change and well-being, Active ageing and self-management of health
Last update: 15 August 2022

GuestXR GuestXR: A Machine Learning Agent for Social Harmony in eXtended Reality
ID: 101017884
From: 1 January 2022 to: 31 December 2025
Immersive online social spaces will soon become ubiquitous. However, there is also a warning that we need to heed from social media. User content is the ‘lifeblood of social media’. However, it often stimulates antisocial interaction and abuse, ultimately posing a danger...
Coordinated in: Spain

Programme: EXCELLENT SCIENCE - Future and Emerging Technologies (FET), FET Proactive
Last update: 13 June 2023

PROJECT

Corruption Roots At the roots of corruption: a behavioral ethics approach
ID: 637915
From: 1 September 2015 to: 31 August 2020
For many years, human cooperation has been praised as beneficial in organizational and personal settings. Indeed, cooperation allows people to develop trust, build meaningful relationships, achieve mutually beneficial outcomes, and strengthen bonding with one's group members...
Coordinated in: Netherlands
Programme: EXCELLENT SCIENCE - European Research Council (ERC)
Last update: 18 August 2022

PROJECT

CAPTAIN Coach Assistant via Projected and Tangible Interface
ID: 769830
From: 1 December 2017 to: 30 June 2021
Older adults typically prefer living at their homes as long as possible. However, they often need to be institutionalized due to the age related problems. Homecare can benefit today from a range of existing technologies including smartphones, sensors, etc., however, their...
Coordinated in: Greece
Programme: SOCIETAL CHALLENGES - Health, demographic change and well-being, Active ageing and self-management of health
Last update: 13 June 2022

EuPOLIS Integrated NBS-based Urban Planning Methodology for Enhancing the Health and Well-being of Citizens: the euPOLIS Approach
ID: 869448
From: 1 September 2020 to: 31 August 2024
EuPOLIS aims to: (a) replace the traditional perception in which engineering systems are built to protect the environment at significant costs. We aim to deploy natural systems to simultaneously enhance Public Health (PH) and Well-Being (WB), and create resilient urban...
Coordinated in: Greece
Programme: SOCIETAL CHALLENGES - Climate action, Environment, Resource Efficiency and Raw Materials, Protection of the environment, sustainable management of natural resources, water, biodiversity and ecosystems
Last update: 19 January 2024

PROJECT

FourCmodelling Conflict, Competition, Cooperation and Complexity: Using Evolutionary Game Theory to model realistic populations
ID: 690817
From: 1 January 2016 to: 31 December 2019
"Real animals and human populations are complex, involving structural relationships depending upon space and time and varied interactions between potentially many individuals. Human societies feature family units, communities, companies and nations. Some animal also have...
Coordinated in: United Kingdom
Programme: EXCELLENT SCIENCE - Marie Skłodowska-Curie Actions, Stimulating innovation by means of cross-fertilisation of knowledge
Last update: 4 September 2023

PROJECT

EVICT The Impact of the International Right to Housing on National Legal Discourse: Using Data Science Techniques to Analyse Eviction Litigation
ID: 949316
From: 1 January 2021 to: 31 December 2025
Eviction – the involuntary loss of one’s home – has a devastating impact on people’s wellbeing and has severe consequences for society as a whole. During and after the financial crisis of 2007-2011, over 700,000 people in Europe either lost their homes or were at risk...
Coordinated in: Netherlands

Programme: EXCELLENT SCIENCE - European Research Council (ERC)
Last update: 10 June 2022

HECAT Disruptive Technologies Supporting Labour Market Decision Making
ID: 870702
From: 1 February 2020 to: 31 July 2023
Hecat aims to investigate, demonstrate and pilot a disruptive technology to support labour market decision making byunemployed citizens and those seeking to help them. At one stage or another, almost half of all EU citizens will rely on aPublic Employment Services (PES), and...
Coordinated in: Ireland
Programme: Explore new forms of innovation, with special emphasis on social innovation and creativity and understanding how all forms of innovation are developed, succeed or fail, SOCIETAL CHALLENGES - Europe In A Changing World - Inclusive, Innovative And Reflective Societies
Last update: 18 December 2023

PROJECT

Human Plus HUMAN+ Towards expertise in enhanced human/technology experience
ID: 945447
From: 1 July 2020 to: 30 June 2025
Rapid developments in information technology in the past three decades have opened up new, unfamiliar frontiers in all areas of society: culture and media, politics and security, health and wellbeing. Big data and machine learning are transforming our experience of social...
Coordinated in: Ireland
Programme: Increasing structural impact by co-funding activities, EXCELLENT SCIENCE - Marie Skłodowska-Curie Actions
Last update: 27 December 2023

PROJECT

ARTSFORMATION Mobilising the Arts for an Inclusive Digital Transformation
ID: 870726
From: 1 April 2020 to: 30 September 2023
Thirty years ago, the internet, social media and smartphones had not been invented. Yet a generation later, almost every facet of our individual, public and -now- online life are dominated by the fast-pacing digital transformation. Last year we saw the privacy and data of...
Coordinated in: Norway
Programme: Explore new forms of innovation, with special emphasis on social innovation and creativity and understanding how all forms of innovation are developed, succeed or fail, SOCIETAL CHALLENGES - Europe In A Changing World - Inclusive, Innovative And Reflective Societies
Last update: 19 December 2023

PROJECT

ROCK Regeneration and Optimisation of Cultural heritage in creative and Knowledge cities
ID: 730280
From: 1 May 2017 to: 31 December 2020
ROCK aims to develop an innovative, collaborative and circular systemic approach for regeneration and adaptive reuse of historic city centres. Implementing a repertoire of successful heritage-led regeneration initiatives, it will test the replicability of the spatial approach...
Coordinated in: Italy
Programme: Cultural heritage, SOCIETAL CHALLENGES - Climate action, Environment, Resource Efficiency and Raw Materials
Last update: 13 September 2023

PROJECT

iRead Infrastructure and integrated tools for personalized learning of reading skill
ID: 731724
From: 1 January 2017 to: 30 June 2021
The overarching aim of the iRead project is to develop a software infrastructure of personalised, adaptive technologies and a diverse set of applications for supporting learning and teaching of reading skills. The specific goals of the project proposed are to:1. Develop a...
Coordinated in: United Kingdom

Programme: INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies - Information and Communication Technologies (ICT)
Last update: 10 June 2022

PROJECT

COPA EUROPE COllaborative Platform for trAnsmedia storytelling and cross channel distribution of EUROPEan sport events
ID: 957059
From: 1 November 2020 to: 31 October 2023
COPA EUROPE aims to address the exploding demand for non-linear sports consumption (live and eSports) by leveraging OTT and combining it with new set of media technologies that will democratise the consumer experience, enable cost-sensitive live video from anywhere, and...
Coordinated in: Spain
Programme: INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies - Information and Communication Technologies (ICT)
Last update: 27 December 2023

TECNIOspringINDUSTRY ACCIÓ programme to foster mobility of researchers with a focus in applied research and technology transfer
ID: 801342
From: 1 June 2019 to: 30 November 2024
TECNIOspring INDUSTRY Fellowship Programme is proposed by ACCIÓ, the Catalan Agency for Business and Competitiveness, attached to the Ministry of Business and Knowledge of the Government of Catalonia. With a budget of 11,085,120 € (46% EU contribution, 54% ACCIÓ own funds)...
Coordinated in: Spain
Programme: Increasing structural impact by co-funding activities, EXCELLENT SCIENCE - Marie Skłodowska-Curie Actions
Last update: 9 December 2022

PROJECT

LEaDing Fellows LEaDing Fellows
ID: 707404
From: 2 January 2017 to: 1 May 2022
The LEaDing Fellow Programme offers 90 two-year postdoc positions to ambitious and excellent researchers who want to perform research in a challenging, internationally esteemed and multidisciplinary environment. The aim is to help them to develop new research skills and a view...
Coordinated in: Netherlands
Programme: Increasing structural impact by co-funding activities, EXCELLENT SCIENCE - Marie Skłodowska-Curie Actions
Last update: 24 January 2023

ID: 770299
From: 1 May 2018 to: 31 January 2022

NewsEye NewsEye: A Digital Investigator for Historical Newspapers
ID: 770299
From: 1 May 2018 to: 31 January 2022
Newspapers collect information about cultural, political and social events in a more detailed way than any other public record. Since their beginnings in the 17th century they are recording billions of events, stories and names, in almost every language, every country and...
Coordinated in: France
Programme: Study European heritage, memory, identity, integration and cultural interaction and translation, including its representations in cultural and scientific collections, archives and museums, to better inform and understand the present by richer interpretations of the past, SOCIETAL CHALLENGES - Europe In A Changing World - Inclusive, Innovative And Reflective Societies
Last update: 8 December 2023

WeVerify WIDER AND ENHANCED VERIFICATION FOR YOU
ID: 825297
From: 1 December 2018 to: 30 November 2021

Online disinformation and fake media content have emerged as a serious threat to democracy, economy and society. Content verification is currently far from trivial, even for experienced journalists, human rights activists or media literacy scholars. Moreover, recent advances...
Coordinated in: Bulgaria
Programme: INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies - Information and Communication Technologies (ICT)
Last update: 4 September 2022

PROJECT

Sharing Cities Sharing Cities
ID: 691895
From: 1 January 2016 to: 31 December 2021
Sharing Cities has four key objectives. 1) To achieve scale in the European smart cities market by proving that properly designed smart city solutions, based around common needs, can be integrated in complex urban environments. This will be done in a way that exhibits their...
Coordinated in: United Kingdom
Programme: SOCIETAL CHALLENGES - Secure, clean and efficient energy, Foster European Smart cities and Communities
Last update: 1 February 2024

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popAI A European Positive Sum Approach towards AI tools in support of Law Enforcement and safeguarding privacy and fundamental rights
ID: 101022001
From: 1 October 2021 to: 30 September 2023
"popAI is a 24 month Coordination and Support Action bringing together security practitioners, AI scientists, ethics and privacy researchers, civil society organisations as well as social Sciences and humanities experts with the purpose of consolidating knowledge, exchanging...
Coordinated in: Greece
Programme: Ensure privacy and freedom, including in the Internet and enhance the societal, legal and ethical understanding of all areas of security, risk and management, Improve cyber security, Secure societies - Protecting freedom and security of Europe and its citizens, Fight crime, illegal trafficking and terrorism, including understanding and tackling terrorist ideas and beliefs
Last update: 29 December 2023

I-CONSENT Improving the guidelines for Informed Consent, including vulnerable populations, under a gender perspective
ID: 741856
From: 1 May 2017 to: 31 March 2021
The informed consent (IC) process allows the subject to voluntarily decide whether or not his/her participation in research. Generally, ICs are difficult to read documents that do not include all stakeholders' perceptions. Therefore, informative IC should be a process that...
Coordinated in: Spain
Programme: Take due and proportional precautions in research and innovation activities by anticipating and assessing potential environmental, health and safety impacts, Develop the governance for the advancement of responsible research and innovation by all stakeholders, which is sensitive to society needs and demands and promote an ethics framework for research and innovation, Integrate society in science and innovation issues, policies and activities in order to integrate citizens' interests and values and to increase the quality, relevance, social acceptability and sustainability of research and innovation outcomes in various fields of activity from social innovation to areas such as biotechnology and nanotechnology, Promote gender equality in particular by supporting structural change in the organisation of research institutions and in the content and design of research activities
Last update: 1 September 2023

PROJECT

ImAc Immersive Accessibility
ID: 761974
From: 1 October 2017 to: 31 March 2020
Advances in technology have led to the availability of consumer Head Mounted Displays and the availability of 360° cameras for capturing immersive content. This has enabled broadcasters to explore new experiences, where narrative and content can be delivered with a heightened...

Coordinated in: Spain
Programme: INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies - Information and Communication Technologies (ICT)
Last update: 4 September 2022

TRACTION Opera co-creation for a social transformation
ID: 870610
From: 1 January 2020 to: 31 December 2022
Opera uses all the visual and performing arts to create extraordinary worlds of passion and sensibility. It is rightly recognised as a great achievement of European culture. And yet a form that once inspired social and artistic revolutions is often seen as the staid preserve...
Coordinated in: Spain
Programme: Study European heritage, memory, identity, integration and cultural interaction and translation, including its representations in cultural and scientific collections, archives and museums, to better inform and understand the present by richer interpretations of the past, SOCIETAL CHALLENGES - Europe In A Changing World - Inclusive, Innovative And Reflective Societies, Research into European countries' and regions' history, literature, art, philosophy and religions and how these have informed contemporary European diversity
Last update: 8 December 2023

PROJECT

Awareness Inside
Awareness and consciousness have been high on the Artificial Intelligence (AI) research agenda for decades. Progress has been difficult because it has been hard to agree on exactly what it means to be aware. Most researches would agree though that we do not have any truly...
Available languages:
EN
Last update: 20 June 2022

IC-3i-PhD Institut Curie 3-i PhD Program
ID: 666003
From: 1 September 2016 to: 31 August 2022
The new IC-3i-PhD program of Institut Curie and its partners will produce top-level scientific knowledge by promoting basic interdisciplinary research that will be translated into novel therapeutic avenues for diagnosis and treatment. The completely re-structured, revitalized...
Coordinated in: France
Programme: Increasing structural impact by co-funding activities, EXCELLENT SCIENCE - Marie Skłodowska-Curie Actions
Last update: 29 April 2023

PROJECT

COMPROP Computational Propaganda: Investigating the Impact of Algorithms and Bots on Political Discourse in Europe
ID: 648311
From: 1 January 2016 to: 31 December 2020
Social media can have an impressive impact on civic engagement and political discourse. Yet increasingly we find political actors using digital media and automated scripts for social control. Computational propaganda—through bots, botnets, and algorithms—has become one of...
Coordinated in: United Kingdom
Programme: EXCELLENT SCIENCE - European Research Council (ERC)
Last update: 24 August 2022

FEDORA Future-oriented Science EDucation to enhance Responsibility and engagement in the society of Acceleration and uncertainty
ID: 872841
From: 1 September 2020 to: 31 August 2023
The relation between science and society is strongly influenced by the impressive acceleration of scientific and technological development. Within this society of acceleration (H. Rosa), the young are experiencing a sense of derangement and an alarming sense of loss of future...

WorkingAge Smart Working environments for all Ages

ID: 826232
From: 1 February 2019 to: 31 July 2022
WorkingAge will use innovative HCI methods (augmented reality, virtual reality, gesture/voice recognition and eye tracking) to measure the user emotional/cognitive/health state and create communication paths. At the same time with the use of IoT sensors will be able to detect...
Coordinated in: Spain
Programme: SOCIETAL CHALLENGES - Health, demographic change and well-being, Active ageing, independent and assisted living, Individual awareness and empowerment for self-management of health
Last update: 28 December 2022

ENLIGHT RISE RESEARCH AND INNOVATION AGENDA WITH AND FOR SOCIETY: Leveraging digital innovation for a greener and healthier Europe
ID: 101035819
From: 1 September 2021 to: 31 August 2024
ENLIGHT is a European university Network to promote equitable quality of Life, sustainability and global engagement through Higher education Transformation. It brings together 9 comprehensive, research-intensive, new flagship universities with a strong reputation. ENLIGHT...
Coordinated in: France
Programme: SCIENCE WITH AND FOR SOCIETY
Last update: 5 February 2024

PROJECT

INVICTUS Innovative Volumetric Capture and Editing Tools for Ubiquitous Storytelling
ID: 952147
From: 1 October 2020 to: 31 December 2022
The INVICTUS project aims at delivering innovative authoring tools for the creation of a new generation of high-fidelity avatars (numerical representations of real humans) and the integration of these avatars in interactive and non-interactive narratives (movies, games, AR+VR...
Coordinated in: France
Programme: INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies - Information and Communication Technologies (ICT)
Last update: 27 December 2023

INBOTS Inclusive Robotics for a better Society (INBOTS)
ID: 780073
From: 1 January 2018 to: 30 June 2021
The main challenge that INBOTS wants to overcomes is the lack of a clear understanding and communication between all the involved stakeholders. These limitations hinder current efforts to successfully discuss and agree on the many important technical and non-technical aspects...
Coordinated in: Spain
Programme: INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies - Information and Communication Technologies (ICT)
Last update: 25 July 2022

CURE Copernicus for Urban Resilience in Europe
ID: 870337
From: 1 January 2020 to: 30 April 2023
Resilience has become an important necessity for cities, particularly in the face of climate change. Mitigation and adaptation actions that enhance the resilience of cities need to be based on a sound understanding and quantification of the drivers of urban transformation and...
Coordinated in: Greece
Programme: INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies – Space, Enabling exploitation of space data
Last update: 18 December 2023
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iTRACK Integrated system for real-time TRACKing and collective intelligence in civilian humanitarian missions
ID: 700510

From: 1 May 2016 to: 30 April 2019
The enduring humanitarian crisis in the Middle East, the unrelenting high levels of violence in Afghanistan and new outbursts of violence in South-Sudan have made 2014 another record-breaking year for acts of violence against humanitarian aid workers. In 2000 41 significant...
Coordinated in: Norway
Programme: Secure societies - Protecting freedom and security of Europe and its citizens
Last update: 16 August 2022

ARCHITECHTURES Empowering building design professionals through Artificial Intelligence on the cloud
ID: 854888
From: 1 March 2019 to: 31 July 2019
In the next 35 years urban population will double producing a huge growing demand for housing. As population grows, concerns related to efficient management of natural resources is also increasing. The pressure is on for developers and design teams to find ways of designing...
Coordinated in: Spain
Programme: PRIORITY 'Societal challenges, INDUSTRIAL LEADERSHIP - Innovation In SMEs, INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies
Last update: 15 August 2022

ARETE AUGMENTED REALITY INTERACTIVE EDUCATIONAL SYSTEM
ID: 856533
From: 1 November 2019 to: 30 April 2023
Augmented Reality (AR) refers to the real-time digital overlay of information over physical elements. ARETE aims to develop, integrate and disseminate interactive technology via AR methods and tools for the creation and inter-connection of existing digital systems and to build...
Coordinated in: Ireland
Programme: INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies - Information and Communication Technologies (ICT)
Last update: 29 January 2024

CARESSES Culture Aware Robots and Environmental Sensor Systems for Elderly Support
ID: 737858
From: 1 January 2017 to: 31 January 2020
The groundbreaking objective of CARESSES is to build culturally competent care robots, able to autonomously re-configure their way of acting and speaking, when offering a service, to match the culture, customs and etiquette of the person they are assisting. By designing robots...
Coordinated in: Italy
Programme: SOCIETAL CHALLENGES - Health, demographic change and well-being, Active ageing and self-management of health
Last update: 13 September 2023

PROJECT

IBSEN Bridging the gap: from Individual Behaviour to the Socio-tEchnical MaN
ID: 662725
From: 1 September 2015 to: 31 August 2018
Developing models of real-world societal scenarios and systems is a key topic in the research agenda of social sciences, but is hindered by the lack of controlled experimentation with large groups of people. IBSEN will provide a breakthrough by building a repertoire of human...
Coordinated in: Spain
Programme: EXCELLENT SCIENCE - Future and Emerging Technologies (FET), FET Open
Last update: 20 July 2023

PROJECT

MAHALO Modern ATM via Human/Automation Learning Optimisation
ID: 892970
From: 1 June 2020 to: 30 November 2022
MAHALO asks a simple but profound question: in the emerging age of Machine Learning (ML), should we be developing automation that matches human behavior (i.e., conformal), or automation that is understandable to the human (i.e., transparent)? Further, what tradeoffs exist, in...

Coordinated in: Italy
Programme: SOCIETAL CHALLENGES - Smart, Green And Integrated Transport, SESAR JU
Last update: 13 June 2023

PROJECT

TELAIGEN The Spanish Telecommunication Sector and the Development of AI Products from a Gender Perspective
ID: 101028792
From: 1 February 2022 to: 31 January 2024
The rise of algorithm-powered technology in the telecommunications industry has been criticised for reproducing gender bias, particularly in Artificial Intelligence-driven (AI) products. This interdisciplinary and intersectoral project explores the gender bias within the...
Coordinated in: Spain
Programme: EXCELLENT SCIENCE - Marie Skłodowska-Curie Actions, Nurturing excellence by means of cross-border and cross-sector mobility
Last update: 28 December 2023

PROJECT

REELER Responsible Ethical Learning with Robotics
ID: 731726
From: 1 January 2017 to: 31 December 2019
REELER - Responsible Ethical Learning with RoboticsRobots are the next ICT-related technology on the horizon ready to radically alter human societies. It is a major societal concern that up to 40% jobs may be replaced by robots over the next 20 years. Few empirical studies...
Coordinated in: Denmark
Programme: INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies - Information and Communication Technologies (ICT)
Last update: 17 August 2022

PROJECT

VICINITY Open virtual neighbourhood network to connect intelligent buildings and smart objects
ID: 688467
From: 1 January 2016 to: 31 December 2019
The lack of interoperability is considered as the most important barrier to achieve the global integration of IoT ecosystems across borders of different disciplines, vendors and standards. Indeed, the current IoT landscape consists of a large set of isolated islands that do...
Coordinated in: Germany
Programme: INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies - Information and Communication Technologies (ICT)
Last update: 5 April 2023

PROJECT

AWARE Coordination Action for Self-Awareness \nin Autonomic Systems
ID: 257154
From: 1 October 2010 to: 30 September 2013
The main aim of the AWARE Coordination Action is to provide a focal point for the wide range of research domains potentially addressed by the FET Proactive Initiative in AWARENESS. Self-awareness in autonomic systems can include ideas and concepts from artificial intelligence...
Coordinated in: United Kingdom
Programme: Specific Programme "Cooperation": Information and communication technologies
Last update: 15 July 2019

PROJECT

City4Age Elderly-friendly City services for active and healthy ageing
ID: 689731
From: 1 December 2015 to: 30 November 2018
The first and core objective of City4Age is to enable Ambient Assisted Cities or Age-friendly Cities, where the urban communities of elderly people living in Smart Cities are provided with a range of ICT tools and services that - in a completely unobtrusive manner - will...
Coordinated in: Italy

Programme: SOCIETAL CHALLENGES - Health, demographic change and well-being, Active ageing and self-management of health
Last update: 15 August 2022

PROJECT

RePAIR Reconstructing the Past: Artificial Intelligence and Robotics Meet Cultural Heritage
ID: 964854
From: 1 September 2021 to: 28 February 2025
Our goal with this project is to develop a ground-breaking technology to virtually eliminate one of the most labour-intensive and frustrating steps in archaeological research, namely the physical reconstruction of shattered artworks. Indeed, countless vases, amphoras, frescos...
Coordinated in: Italy
Programme: EXCELLENT SCIENCE - Future and Emerging Technologies (FET), FET Open
Last update: 29 January 2024

NANOINFER Intelligent Memories that Perform Inference with the Physics of Nanodevices
EASYTV Easing the access of Europeans with disabilities to converging media and content
ID: 761999
From: 1 October 2017 to: 30 June 2020
One of the many challenges people with various degrees of disabilities face (visually or hearing impaired) is their inability and difficulty to access mainstream products and services thus being excluded from enjoying audio-visual services on an equal basis as people without...
Coordinated in: Spain
Programme: INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies - Information and Communication Technologies (ICT)
Last update: 4 September 2022

ReaLsMs Real Smart Cities
ID: 777707
From: 1 December 2017 to: 31 May 2022
The overarching objective of the ReaLsMs is to develop and implement a perspective on the Smart City through critical humanities research and innovation in the context of the Digital Studies. The joint research fields of ReaLsMs will be the development of historical and...
Coordinated in: Ireland
Programme: EXCELLENT SCIENCE - Marie Skłodowska-Curie Actions, Stimulating innovation by means of cross-fertilisation of knowledge
Last update: 8 December 2023

PROJECT

VRTogether An end-to-end system for the production and delivery of photorealistic social immersive virtual reality experiences
ID: 762111
From: 1 October 2017 to: 31 December 2020
VR-Together will offer new ground-breaking virtual reality experiences based on social photorealistic immersive content. For this purpose, it will develop and assemble an end-to-end pipeline integrating state-of-the-art technologies and off-the-shelf components. The challenge...
Coordinated in: Spain
Programme: INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies - Information and Communication Technologies (ICT)
Last update: 11 August 2021

PROJECT

ELG European Language Grid
ID: 825627
From: 1 January 2019 to: 30 June 2022
With 24 official EU and many more additional languages, multilingualism in Europe and an inclusive Digital Single Market can only be enabled through Language Technologies (LTs). European LT business is dominated by thousands of SMEs and a few large players. Many are...
Coordinated in: Germany

Programme: INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies - Information and Communication Technologies (ICT)
Last update: 28 December 2022

PROJECT

IMPACT Impact of Cultural aspects in the management of emergencies in public Transport
ID: 653383
From: 1 May 2015 to: 31 October 2017
The objective of the IMPACT project is to investigate the essential role played by cultural factors in managing safety- and security-issues related to emergencies in public transport systems.The IMPACT Coordination and Supporting Action is aimed at analysing the different...
Coordinated in: Italy
Programme: Secure societies - Protecting freedom and security of Europe and its citizens
Last update: 24 May 2023

SIRCIW Strengthening International Research Capacity in Wales
ID: 663830
From: 1 September 2015 to: 28 February 2022
Scientists in Wales are efficient, productive, collaborative, impactful and in many cases world leading. Recent evidence shows scientific excellence but a lack of critical mass in areas most likely to drive a knowledge economy through innovation and translation. This...
Coordinated in: United Kingdom
Programme: Increasing structural impact by co-funding activities, EXCELLENT SCIENCE - Marie Skłodowska-Curie Actions
Last update: 3 October 2023

PROJECT

Hungry EcoCities AI enabled artistic solutions for sustainable food systems
ID: 101069990
From: 1 September 2022 to: 28 February 2026
Agriculture has been a nursery for practical solutions to global challenges for a long time. EU agriculture is the only major system in the world that reduced greenhouse gas (CHC) emissions by 20% since 1990. Nonetheless, even though the EU's transition to sustainable food...
Coordinated in: Czechia
Programme: Digital, Industry and Space, Artificial Intelligence and Robotics
Last update: 18 August 2022

PROJECT

EOSC-Nordic EOSC-Nordic
ID: 857652
From: 1 September 2019 to: 30 November 2022
EOSC-Nordic aims to facilitate the coordination of EOSC relevant initiatives within the Nordic and Baltic countries and exploit synergies to achieve greater harmonisation at policy and service provisioning across these countries, in compliance with EOSC agreed standards and...
Coordinated in: Norway
Programme: Developing new world-class research infrastructures, EXCELLENT SCIENCE - Research Infrastructures
Last update: 12 December 2023

PROJECT

EASYRIGHTS Enabling immigrants to easily know and exercise their rights
ID: 870980
From: 1 January 2020 to: 30 November 2022
The overarching objective of EASYRIGHTS is to develop a co-creation eco-system in which different actors belonging to the local governance system can cooperate in increasing the quantity and quality of public (welfare) services available to immigrants. The specific aims are to...
Coordinated in: Italy
Programme: The mechanisms to promote smart, sustainable and inclusive growth, SOCIETAL CHALLENGES - Europe In A Changing World - Inclusive, Innovative And Reflective Societies, Trusted organisations, practices,

services and policies that are necessary to build resilient, inclusive, participatory, open and creative societies in Europe, in particular taking into account migration, integration and demographic change
Last update: 1 February 2024

EDITO DIGITAL HANDLING AND DISTRIBUTION OF PERSONALIZED PRESS CLIPPINGS
ID: LE12246
From: 1 November 1995 to: 31 October 1997
EDITO is developing an application for press editors to deliver advanced on-line news services. The system is intended to retrieve press cuttings from a large newspaper database, filtered according to the subscriber-specified subject. It has tools for viewing, marking up and e...
Coordinated in: France
Programme: Specific programme of research and technological development and demonstration in the area of telematic applications of common interest, 1994-1998
Last update: 1 November 1996

ANNEXES VI to X

ANNEX VI:
OUTSTANDING AI-ENABLED PROJECTS ON
INDUSTRIAL TECHNOLOGIES AND MANUFACTURE

ANNEX VII:
OUTSTANDING AI-ENABLED PROJECTS ON
AUGMENTED MEDICINE AND HEALTHCARE

ANNEX VIII:
OUTSTANDING AI-ENABLED PROJECTS ON
SUSTAINABLE ENVIRONMENT AND ENERGY

ANNEX IX:
OUTSTANDING AI-ENABLED PROJECTS ON
ICT, MOBILITY AND SECURITY

ANNEX X:
OUTSTANDING AI-ENABLED PROJECTS ON
ETHICAL, LEGAL AND SOCIAL DISCIPLINES

Note:
Stemming from the previously identified set of 650 AI-powered successful projects illustrated in Annexes from I to V, a distilled subset of 86 outstanding AI-powered projects is presented, essentially funded under Horizon Europe, H2020, ERC, FP7 and FP5, where AI plays a particularly important role at various project layers, i.e., aim, objectives, challenge, content, mission, expected results, outputs, upshots and outcomes. The discriminants which enabled this selection are the importance, extent, and magnitude of the role AI performed therein, resulting in a particularly outstanding impact in terms of number and quality of: (a) IPR; (b) patents; (c) publications; (d) protocols – e.g., production, application, clinical; (e) prototyping. Each cluster has been populated with a certain bulk of projects, displayed herein, i.e.,

(vi) 22 projects in AI-enabled Industrial Technologies and Manufacture.
(vii) 21 projects in AI-enabled Augmented Medicine and Healthcare, more in detail, its main branches have been addressed: Diagnostics, Theragnostics, Targeted Drug-Delivery and Regenerative Medicine.
(viii) 9 projects in AI-enabled Sustainable Environment and Energy.
(ix) 20 projects in AI-enabled ICT, Mobility and Security.
(x) 14 projects in AI-enabled Ethical, Legal and Social disciplines.

ANNEX VI:
OUTSTANDING AI-ENABLED PROJECTS ON INDUSTRIAL TECHNOLOGIES & MANUFACTURE

ANNEX VII:
OUTSTANDING AI-ENABLED PROJECTS ON AUGMENTED MEDICINE AND HEALTHCARE

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ANNEX VIII:
OUTSTANDING AI-ENABLED PROJECTS ON SUSTAINABLE ENVIRONMENT AND ENERGY

ANNEX IX:
OUTSTANDING AI-ENABLED PROJECTS ON ICT, MOBILITY AND SECURITY

ANNEX X:
OUTSTANDING AI-ENABLED PROJECTS ON ETHICAL, LEGAL AND SOCIAL DISCIPLINES

About the author

Matteo Bonazzi has worked as program officer in nano-bio-info-cogno converging sciences and technologies, as well as in communication outreach, at the European Commission from 2003 to 2024. Herein he has been managing fifty research and innovation projects over twenty years. He also worked for private and public bodies in Spain and Italy on science, sustainability, and culture. He authored 30 books and edited two on converging science and technologies, sustainability, and culture, written in several languages. He also authored fifty scientific articles and eighty contributions to proceedings and seminars on the same subjects. On the top of that, he conceived, designed, and developed six exhibitions and twenty workshops, contributing to newspapers, media programs and software. Last but not least, he gave lectures as Prof. Dr. habil. at the University of Vilnius (Lithuania), as well as speeches and lectures in twenty academic institutions worldwide. He graduated cum laude with honorable mention in Natural Sciences at the Turin University (Italy). Thanks to his dissertation in eco-ethology developed in central Africa at the Kenya Marine Fishery Research Institute of Mombasa (Kenya) he was awarded the title and Medal of "Best in the School" for best curriculum and dissertation by the academic Senate of Turin University (Italy). He holds a postgraduate European Master in Environmental Engineering, issued by the European Polytechnic Environmental Association at the Polytechnic of Turin (Italy) and the Université de Savoie (France), as well as a postgraduate International Master Specialization Course in Fats issued by the Consejo Superior de Investigación Científica of Seville (Spain). He holds a PhD in Environmental Engineering issued by the University of Surrey (England), awarded with honorable mentions by the Centre for Environmental Strategy of Guildford (U.K.) and the University of West Indies of Kingston (Jamaica). He possesses both work and research experience in various countries of Europe, Asia, Africa, and the Americas.