

AI + SUSTAINABLE DEVELOPMENT + INNOVATION + DIVERSITY

IRCAI Global Top 100 Report 2022



Sustainable
Development
Goals



100 Artificial Intelligence Approaches for Sustainable Development and the Benefit of Humanity



The Report

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Interactive results from the 2022 Global Top 100 call are available at the [IRCAI Global Top 100](#).

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Preface

This report shows that Artificial Intelligence (AI) will increasingly be intertwined with the idea of solving development challenges. As we reach the halfway mark of the 2030 Sustainable Development Goals, it is clear that the global research community has made great advances, and coupled with the power of AI, this impact is becoming significant and visible to the general public.

Reading through this report will expose some familiar themes: AI is rapidly creating opportunities for innovation, growth and prosperity across the world, as well as research pockets of innovation hubs across the globe. At the same time, we see evidence that AI creates a range of new risks, such as lack of equity, inclusion and diversity, and furthermore, physical and mental health, bias and discrimination, and infringements on privacy and individual rights, among other ethical breaches.

It is the IRCAI team's assessment that AI-based solutions to real-life problems are increasingly evident and robust, both in terms of research ingenuity and cultural or scientific identity, as well as in their capacity to drive economic prosperity and major research advances.

As an ensemble, the 2022 cohort of the 100 International Projects in AI and SDGs show great maturity, as became evident across IRCAI's 10-month journey to explore, map and showcase the vast amount of research, technical and hands-on solutions presented therein. Our job was to simply connect the dots where they may not have been previously linked, and to present the work of nonprofits, universities, governments and others, suggesting that AI can create business opportunities as well as reduce the time and resources needed to make progress towards solving some of the world's toughest challenges.

We invite you to discover how teams across the world are already using AI to tackle the SDGs, learning more about the industries, domains, and regions in which they operate, and what they need to scale.

Davor Orlic, Chief Operations Officer at IRCAI

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We would like to thank IRCAI colleagues and members of the IRCAI Scientific Programme Committees, Scientific Journal Editorial Board, and Business and Impact Council for assisting in the design, execution and follow up of the call for proposals and reviews and for their invaluable feedback and inputs.

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Our special thanks go to Massimo Preziuso as the Chair of Business and Impact Council at IRCAI for leading the work on the impact campaign through different networks and for making sure the best work was delivered.

We thank our partners Amazon AWS for training and coaching opportunities, and Knowledge for All Foundation (K4A) for supporting this action as part of the ongoing collaboration with the AI Networks in Africa and Europe.

Executive Summary

The International Research Centre in Artificial Intelligence (IRCAI), established by the Jožef Stefan Institute, UNESCO, and the Slovenian Government, is committed to supporting the development of AI-based solutions for achieving the United Nations' Sustainable Development Goals (SDGs). In 2021, IRCAI launched the Global Top 100 program, a global call for proposals that harness the power of existing AI technologies to address and achieve the 17 SDGs, which featured one hundred AI applications from around the world. **The 2022 edition of the IRCAI Global Top 100 showcases the phenomenal success and marked improvement of the program in both quality and quantity of proposals**, covering all 17 SDGs across multiple sectors and all five geographic regions.

The selection and review process aimed to identify AI-based projects that presented robust applications directly or indirectly addressing one or more Sustainable Development Goals. **The projects were evaluated across 4 key criteria: scientific maturity and use of AI tools, impact on relevant SDGs, market readiness, and ethical ramifications.** Additionally, this year's call paid particular attention to ethical and rights-based awareness of the applicants in their proposed AI solutions.

The results of the call were surprising and encouraging, showing a considerable improvement over the first edition, especially in terms of the diversity and quality of proposals. A substantive analysis of the applications revealed several insights concerning the state of today's sustainability tech space.

We observe a higher degree of diversity across the projects in terms of applications' origin and data sources, including the additional participation of 22 new countries. Despite most projects still hailing from the Global North (60%), **there is a positive trend in increasing participation from the Global South**, and an increase in representation from Africa and Asia by 17% and 13,5%, respectively. Further still, many of the projects developed in the Global North see their context of application in the Global South, pointing to an encouraging attention to the democratisation of AI's benefits, but just the same, to a lack of local context intelligence considerations, and a challenging potential for data imperialism and bias.

Diversity was also evident in the gender distribution of the projects, representing a promising further trend in the landscape of sustainable technologies: a slight 4% increase in female-led applications in the 2022 cohort, for an estimated 38% female-led projects. **These results remain significantly higher than relevant benchmarks for female participation in the tech space.** Although, work must continue to close this gap.

Regarding the proposals' topics of interest, **there is a resurgence of project clusters amongst the excellent and outstanding applicants**, like Biodiversity, Environmental Social Governance (ESG) and Impact Investment, and Policy and Regulation.

Representation of the 17 SDGs remained similar across 2021 and 2022, with a moderate increase for SDGs 7, 9, 11, 12 and 17, and a slight decrease in participation for SDGs 4 and 10. In contrast to last year, **the two most underrepresented SDGs (6 and 14) were nonetheless represented among the excellent and outstanding categories.**

Similar to last year, **we observed an indirect relationship between the number of SDGs addressed by a single application on the one hand, and the authenticity of SDG-oriented intentions, on the other.** Indeed, 40% of this year's applicants claimed to address four or more SDGs in their solutions. Analysis revealed both a type of 'shoe-horning' effect where adherence to SDGs was born more of a posteriori circumstances than a priori intentions, and a general lack of substantive awareness of the SDGs amongst these projects. **While these trends have decreased from 2021 to 2022, they still point to the need for future education, literacy, and work efforts for the Sustainable Development Goals.**

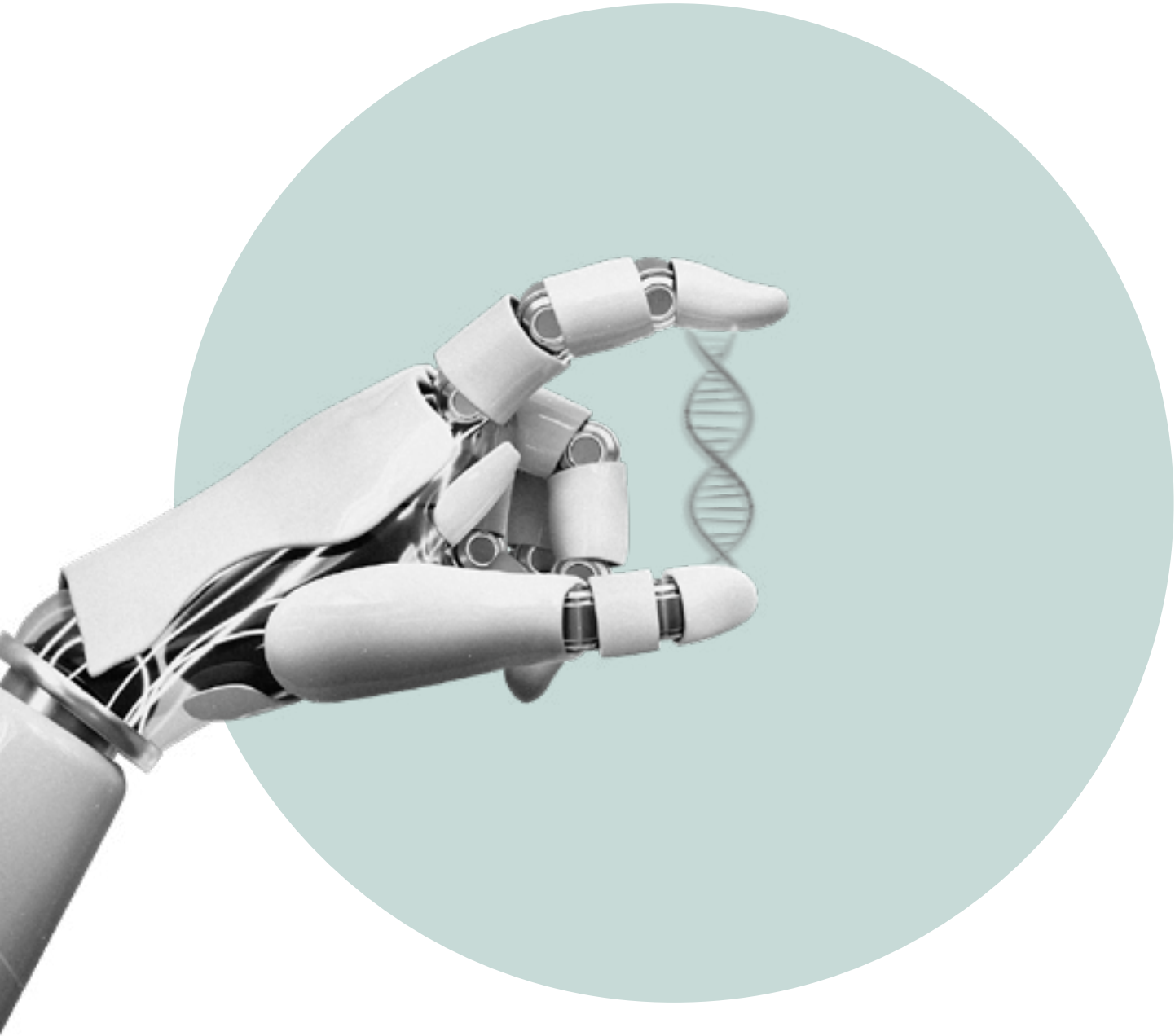
In a similar vein, the ethical and rights-based knowledge of the applicants proved to be relatively rudimentary in this year's call. Besides a small subset of applications, **many AI solutions did not disclose or consider how their algorithms, data, training, or business practices impact important principles such as fairness, transferability, privacy, or the welfare of the user.** This may point to a sort of pacing problem where developers and founders lack the knowledge on how to practically and specifically integrate ethics into their solutions, or to mitigate relevant value trade-offs in design, despite the resurgence of a relevant number of AI ethics guidelines and frameworks in the global AI ecosystem. IRCAI aims to help close this knowledge gap across its efforts in the coming years.

Industry representation showed a great news: **"Environment" participation increased by almost 100%.** Beyond this, a slight decrease in heterogeneity was observed in this year's call, with only 17 industries represented, compared to 23 in the previous call. Moreover, dominant industries have not changed, with 'Computer Software', 'Education', 'Health', and 'Agriculture' maintaining their high participation. Additionally, the sectoral analysis revealed similar results across 2021 and 2022, where most of the projects are born in the private sector (53%).

Funding and public exposure constitute projects' principal needs, representing 74% and 72% of all proposals, respectively, followed by mentorship (45%), customers (39%), High Performance Computing (HPC) resources and Cloud Computing (35%), and personnel (35%). Furthermore, IRCAI provided the option to share the GitHub content of project proposals during the application process, an option of which slightly more than 25% of applicants took advantage. Finally, **17% of this year's applicants also participated in 2021,** pointing to the will to continue their collaboration with IRCAI as their projects mature.

One final takeaway relates to the potential this year's cohort showed for the SDGs advancement monitoring, with roughly 66% of projects placing attention on building data sets that might be valuable towards this end. In this sense, beyond the Global Top 100 program, IRCAI aims to foster a data-sharing culture across the sustainable tech ecosystem in its broader activities, facilitating the type of global participation and collaboration that is likely required to achieve Sustainable Development Goals.

With the advent of innovations such as foundational models or General Purpose AI, the balance between technological benefit and ethical risk will only be exacerbated, making the future Global Top 100 calls a crucial litmus test for the desirability and course of AI-powered SDG solutions. We welcome this challenge and are curious about what next year's call will bring.



Introduction

The International Research Centre in Artificial Intelligence (IRCAI), established by the Jožef Stefan Institute, UNESCO, and the Slovenian Government, is committed to supporting the development of AI-based solutions for achieving the United Nations' Sustainable Development Goals (SDGs). In 2021, IRCAI launched the Global Top 100 program, a global call for proposals that harness the power of existing AI technologies to address and achieve the 17 SDGs, which featured one hundred AI applications from around the world.

The 2022 edition of the IRCAI Global Top 100 showcases the phenomenal success and marked improvement of the program in both quality and quantity of proposals, covering all 17 SDGs across multiple sectors and all five geographic regions. The use of artificial intelligence (AI) in sustainable development is no longer a novelty, but rather a thriving area of innovation among organisations worldwide. Analysis of this year's submissions revealed a diverse and engaging international environment for sustainable applications, and an entrepreneurial ecosystem within the sustainable tech space of global reach and impact.

The 2022 edition of the program also reveals much about the shape, scope, and impact of today's AI-based sustainable development solutions. One of the most significant insights is the sheer diversity of initiatives. The report highlights projects that pull from a multiplicity of data sources, including aerial, text corpus,

satellite, infrared, sound records, and CO₂ storage, to develop state-of-the-art AI technology which intentionally contributes to one or more SDGs.

The 2022 edition also paid particular attention to AI ethics, notably to potential bias within the proposed solutions. The report found that AI ethics is still in its nascent stage, and through its subsequent analysis, explores why this might be the case.

The results of the 2022 edition of the IRCAI Global Top 100 program align with the aim of IRCAI, which is to suggest that the role of AI in sustainability is not transient, but increasingly permanent and thriving across a variety of organisations. By highlighting these projects, this report aims to inspire further innovation and collaboration and demonstrate the potential of AI in achieving sustainable development for all.

Artificial intelligence (AI) has emerged as a game-changer in the global aims of sustainable development. Organisations around the world are leveraging AI-based solutions to tackle a wide range of challenges, from poverty and hunger to climate change and healthcare. This report showcases some of the most innovative AI-based projects designed to contribute to the Sustainable Development Goals (SDGs), the promise and impact of which will be made plain in the ensuing report.

PART 1.

The 2022 Call Report

1.1 Process

ABOUT THE METHODOLOGY

The 2022 call was a collaborative effort involving various committees within IRCAI, including scientific program committees, business experts, and impact council members. The selection and review process aimed to identify AI-based projects that presented robust applications directly or indirectly addressing one or more sustainable development goals. The focus was on the innovative research that drove these applications, with a strong emphasis on machine learning, artificial intelligence and data science, regardless of the scientific discipline.

To evaluate the projects, the review board used four key criteria:

1. The AI and Science dimension of the project's proposed application. The extent to which AI was integral to its delivery, including a proof of concept or a research paper demonstrating its potential.
2. The project's impact on the relevant SDG(s), measured through key performance indicators or by providing systems that improve them.
3. The business aspects of the projects, including market need, sustainability of the product or service and team characteristics.
4. The ethical impact and ramifications of the proposed application, including its alignment with relevant ethical design principles such as transparency, privacy, and accountability, or the AI model's technical and environmental sustainability.

This comprehensive process involved thorough scientific, ethical, and entrepreneurial review of each project submitted, as well as providing feedback, expert counselling, networking, partnerships, visibility, and potential financial support for future development.

The report provides a detailed analysis of the results and key insights gleaned from the projects submitted to the call. It also discusses how these findings may impact future initiatives within IRCAI and the development of the sustainable tech global ecosystem, using both qualitative and quantitative analyses.

1.2 Results

FOCUS AND SDG DISTRIBUTION

FOCUS AND SDG DISTRIBUTION

As with any new innovation, AI presents both risks and opportunities. In particular, AI-based technologies have the potential to positively impact our ability to achieve the SDGs, but also have the potential to hinder progress. While the deployment and use of AI can have a revolutionary impact on our well-being, these same technological advances can also exacerbate existing shortcomings in our societies.

The focus of the 2022 IRCAI Global Top 100 edition was to examine the extent to which proposed AI-based projects contribute to achieving the UN SDGs, and their awareness about Ethics and Human Rights frameworks. Are the projects truly aligned with the stated SDGs? Do they have measurable indicators to track progress on the SDGs? How do the project proposals fit with existing initiatives aimed at achieving the relevant SDGs?

With all 17 SDGs represented across the proposed applications of the 2022 cohort, this Global Top 100 edition provides a good overview of how AI-enabled technologies are currently being used to address sustainability challenges.



Image 1. The 17 United Nations Sustainable Development Goals

As part of our mission to explore how AI-based projects can advance achieving the UN’s SDGs, much of IRCAI’s work focuses on how these projects can best engage with stakeholders to expand and diversify their reach. In this regard, a framework such as the 17 SDGs is well-suited to achieve our common sustainability objectives by involving diverse stakeholders. However, for the framework to truly encourage the creation of cross-sectoral, cross-stakeholder, and principle-based partnerships, we must continue to address the persistent lack of substantive SDGs awareness among public institutions, private companies, NGOs, educational institutions, and civil society.

The 2022 edition results of the IRCAI Global Top 100 revealed critical insights concerning the shape, scope and impact of today’s AI-based sustainable development solutions. Perhaps most relevant among them is:

INSIGHT 1

DIVERSITY OF INITIATIVES

Projects coming from the five continents using a large variety of data sources (aerial, text corpus, satellite, infrared, sound records, CO2 storage, etc) to develop state-of-the-art AI technology truly aiming to contribute to one or more SDGs. Remarkable examples of this type are the projects:

*** Artificial Intelligence–Based Referral System for Patients With Diabetic Retinopathy in Jalisco**

This team developed an AI model based on Deep Convolutional Neural Networks for detecting vision loss in diabetic patients by preprocessing, scoring and classifying Retinal Fundus Images (RFI). From Latin America. Potential application worldwide. Truly contributing to SDG 3.

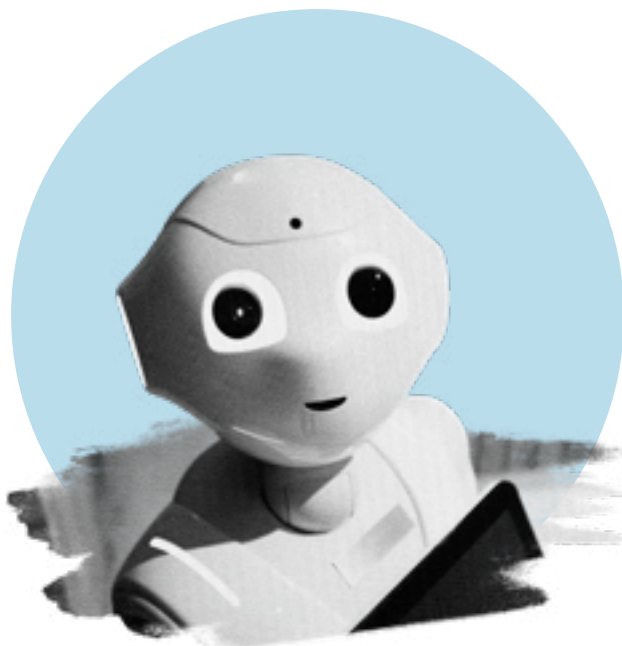
*** Mbaza AI**

This team developed an open-source algorithm designed for biodiversity monitoring at a high scale, by using camera traps (images and video) and carrying out the data analysis entirely offline. The algorithm enabled park rangers to shorten the time a typical batch of collected data takes to be processed from weeks to hours. From Eastern Europe. Potential application worldwide. Truly addressing SDGs 13 and 15.

*** Afrocentric NLP**

To adapt the deployment of technologies to the needs of local African communities, this team developed a neural language identification (LID) toolkit for as many as 517 African languages and varieties. The toolkit exploits a dataset manually curated from across 50 African countries and utilising five orthographic systems. From North America. Potential application worldwide, with strong emphasis in Africa. Truly addressing SDGs 10.

FOCUS AND SDG DISTRIBUTION



This edition of the program also revealed thematic clusters of projects, in particular among the Excellent and Outstanding ones.

INSIGHT 2

EXCELLENT AND/OR OUTSTANDING PROJECT CLUSTERS

Groups of projects among the Excellent or Outstanding categories, addressing similar problems and using similar AI technology. Remarkable examples are:

BIODIVERSITY CLUSTER

Projects using complementary and/or similar AI technology and/or data, and sharing a common objective: contribute to biodiversity preservation. Examples are:

* **Arbimon**

A freely accessible platform that uses AI technology to bridge the gap between scientists and conservation managers by enabling users to gain ecological insights from acoustic data.

* **Sentinel**

By plugging devices such as trail cameras or acoustic monitors into existing environmental sensors, Sentinel's AI models automatically detect vulnerable/invasive species and poachers. These allow users to capture real-time information for research, wildlife crime management and environmental protection.

* **Mbaza AI**

An algorithm for monitoring biodiversity using camera traps (images and video) and analysing the data offline. It helps park rangers process data much faster, reducing processing time from weeks to hours.

ENVIRONMENTAL, SOCIAL AND GOVERNANCE (ESG) AND IMPACT INVESTMENT CLUSTER

Projects using complementary and/or similar AI technology and/or data, and sharing a common objective: to better inform ESG and Impact investment. Remarkable examples are:

* **MALENA**

An NLP-based ESG analyst tool enabling investors to quickly review ESG texts developed by the International Finance Corporation (IFC) to make SDG-integrated investments in emerging markets. The tool is able to identify more than 1,200 ESG risk terms, then performs a sentiment analysis to assign positive, negative or neutral sentiment to the risk terms, depending on the context.

* **UTIL**

This solution provides investors with an evidence-based analysis tool that tracks the performance of companies across the 17 SDGs, their 169 sub-goals, and 2 thousand more sustainability concepts, by running NLP analysis on more than 1 million scientific publications. UTIL's dataset consists of more than 50,000 listed companies, enabling clients to assemble well-differentiated financial products that measure against sustainability issues.

POLICY AND REGULATION CLUSTER

Projects using complementary and/or similar AI technology and/or data, and sharing a common objective: to improve access and understanding about policy and regulation on climate issues. Remarkable examples are:

* **AI-powered tools for climate law and policy data research**

A platform developed by training AI algorithms to analyse large amounts of text from resources such as government websites or climate negotiation documents, which can then help classify and link relevant policy instruments and legal principles.

* **RuleWatcher**

A platform to provide clients with a web service to extract information on the rule-making process of governmental bodies, NGOs and research institutions with regards to environmental and human rights issues.

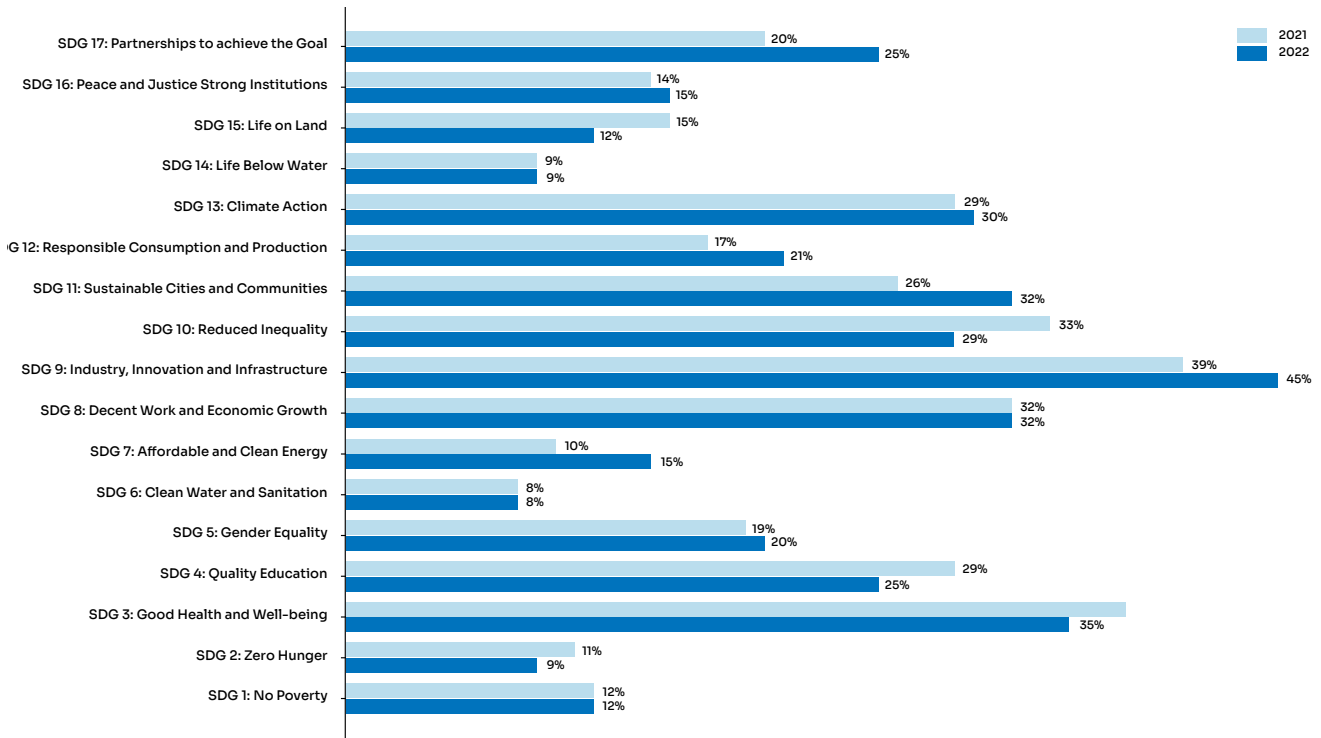


Figure 1. Representation of SDGs across projects in 2021 and 2022

From Graphic 1 we observe that SDG representation across projects is quite similar from 2021 to 2022. While SDGs 7, 9, 11, 12, and 17 (“Affordable and Clean Energy”, “Industry, Innovation, and Infrastructure”, “Sustainable Cities and Communities”, “Responsible Consumption and Production”, and “Partnerships for the Goals”) saw a moderate increase in participation, SDGs 4 and 10 (“Quality Education”, and “Reduced Inequalities”) saw a slight decrease.



Figure 2. Top 7 SDGs across proposed applications in 2021 & 2022

The stability from the 2021 to 2022 edition is clearly manifested in the Top 7 represented SDGs. Although in a different order, these remained the same for both years, with SDGs 3, 4, 8, 9, 10, 11, and 13 remaining at the forefront (“Good Health and Well-Being”, “Quality Education”, “Decent Work”, “Industry, Innovation and Infrastructure”, “Reduced Inequalities”, “Sustainable Cities and Communities”, and “Climate Action”).

Similarly, the underrepresented SDGs remain the same from 2021 to 2022: 2, 6 and 14 (“Zero Hunger”, “Clean Water and Sanitation” and “Life Below Water”). However, SDG 7 (“Affordable and Clean Energy”), which was among the underrepresented SDGs in 2021, saw the biggest increase in representation for the 2022 edition.

This heterogeneity might be caused by a wide range of factors: AI maturity and hype for some markets/sectors, availability and types of data, expertise and passions of the applicants, identifiable market needs, the financial viability of the project concepts, the limitations or mandates of their host institutions, perhaps even the scope or specificity of a given SDG. The information analysed for the 2022 edition has revealed this trend, but the substantive reasons for its existence remain beyond the scope of this report.

INSIGHT 3

SDGs 6 & 14: UNDERREPRESENTED BUT IMPACTFUL

Although SDGs 6 and 14 were underrepresented across the submissions, they were present among the Excellent and/or Outstanding categories, thanks to projects specifically addressing these SDGs:

*** Smartex**

An AI system based on machine vision to identify and classify defects in textiles. By detecting defects from as early as the point of production, the system can significantly reduce production waste and water pollution.

*** Mobius: Artificial intelligence for scalable and standardised whale monitoring**

Based on remote aerial imagery, Mobius can perform image analysis to detect, locate, and classify whales. This cutting-edge technology can help industry meet its sustainability goals, and allows governments to manage protected areas more easily.

FOCUS AND SDG DISTRIBUTION

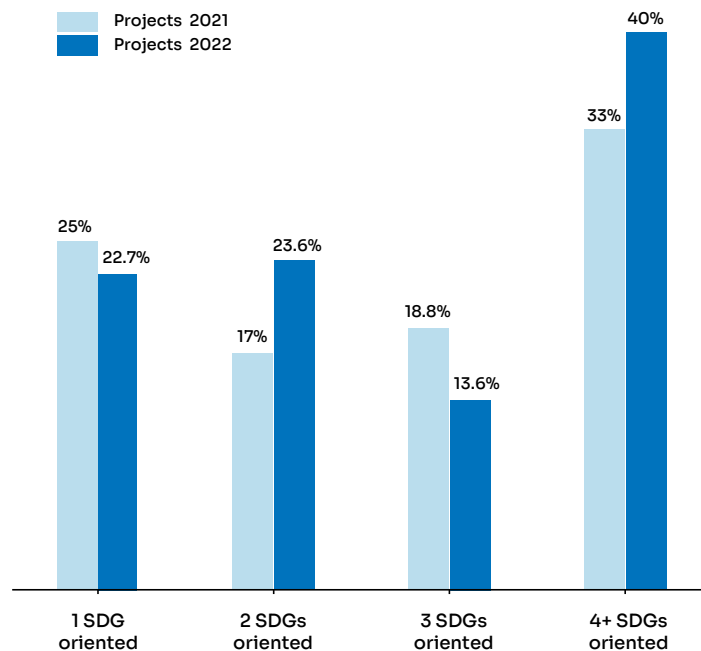


Figure 3. Projects specificity in supporting SDGs

The reasons for changes in the specificity of projects' SDGs from 2021 to 2022 are surely too complex to adequately unpack here. However, similar to last year's edition, we observed an indirect relationship between the number of SDGs to which each project aimed to contribute, and the authenticity of their contribution.

We inferred that a significant proportion of projects aiming to contribute to many SDGs (four or more) may indicate a “shoe-horning” approach or a lack of proper awareness and understanding of the SDGs.

INSIGHT 4

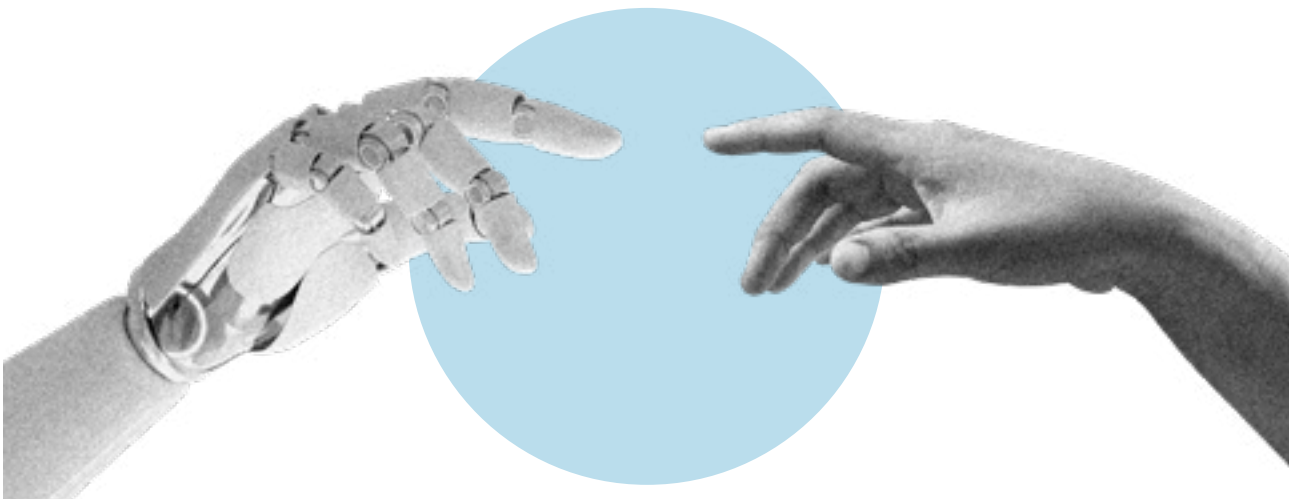
INTENTIONAL SDG CONTRIBUTION V. 'SHOE-HORNING'

Beyond a small subset of proposals which truly aim at a transversal contribution to the SDGs, an estimated 40% of this year's proposals support 4 or more SDGs. The information provided by the applicants revealed two key trends:

- * A type of 'shoe-horning' amongst a small subset of submissions, where alignment with the SDGs arrived more from a posteriori circumstances and opportunities than a priori intentions.

- * A lack of proper awareness and understanding of the SDGs, and how AI could be practically harnessed to achieve them.

A detailed reading of the results showed the “shoe-horning” to be of not major significance, and having a decreasing trend from 2021 to 2022. Nevertheless, the analysis also indicates the need for increased communication, awareness and improved understanding around the SDGs and the ways in which AI could be practically harnessed to achieve these, a gauntlet which IRCAI will endeavour to take up in future work.



Another relevant trend is revealed by distinguishing across three categories of project submissions: those that desire to harness AI technology to truly advance one or more SDGs, those that developed an AI technology for which their product/service indirectly contributes to the advancement of one or more SDGs, and those projects that use AI, and in some collateral way may be contributing to one or more SDGs.

The analysis of the submissions also showed an incipient knowledge and understanding of AI Ethics: just a few projects expressed proper knowledge and understanding of AI Ethics and Human Rights concerns, and how this relates to the data they collect and use, or the algorithms of projects showed a solid level of awareness and engagement with different Ethics and Human Rights frameworks.

INSIGHT 5

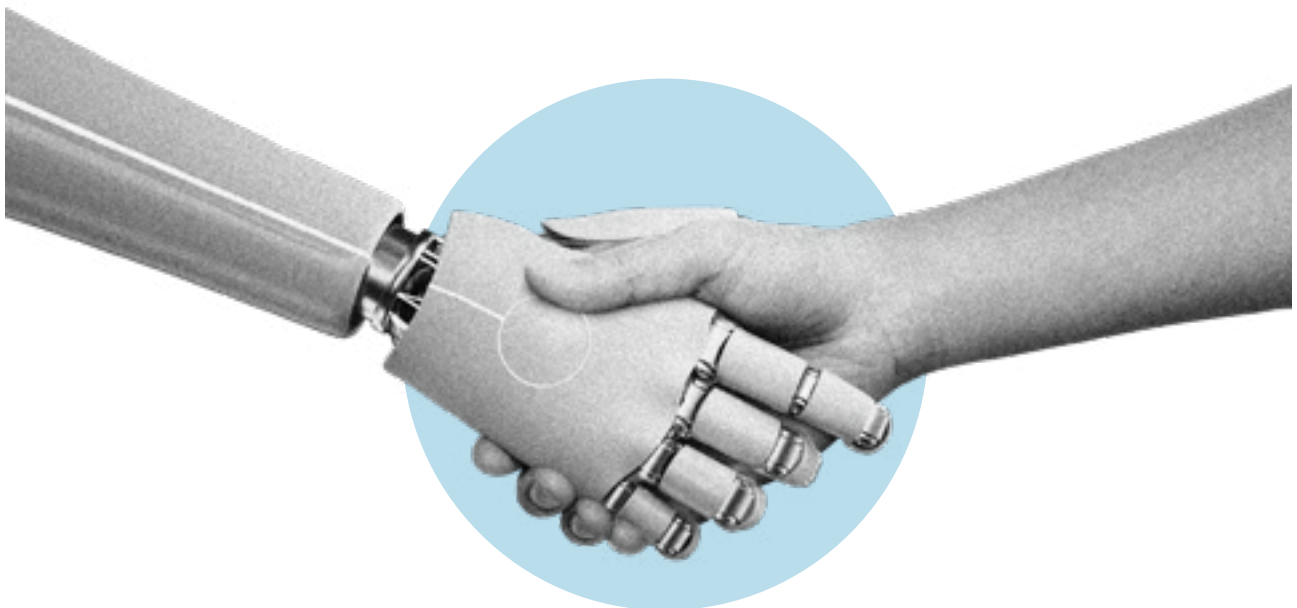
A NASCENT APPLICATION OF AI ETHICS PRINCIPLES

This generalised lack of ethical awareness and application could be the result of a number of factors. Beyond issues of literacy, and perhaps a reluctance to engage with the sometimes stringent constraints of ethically aligned design, a type of pacing problem might also exist between the institutional production of AI ethics guidelines on one hand, and their practical implementation in AI practices, on the other. Patently, AI developers may not know how best to integrate ethical considerations into their products and services despite a recognition of their importance, especially when

- * a commitment to ethical principles generates complex design trade-offs with other important values such as safety, efficiency or accuracy, and

- * the innovative quality of a project may make it difficult to identify ethically relevant industry best practices and standards.

In short, a substantive commitment to ethics in design often requires the ability to interpret the implications of an array of design goals, ethical principles and societal values in context and in tandem, a task whose demands might exceed the capacity of many start-ups and low-resource projects. In this regard, normative frameworks such as UNESCO’s recommendation on AI Ethics can serve to clarify important goal posts in key policy areas, and over time, aid in the development of normative convergence in AI design and implementation. Moreover, an important aspect of IRCAI’s mission is to address and mitigate this gap between ethical motivation and technical application in the AI sector, especially as it pertains to navigating the SDGs, AI Ethics and Human Rights considerations in practice.



1.3 Results

GEOGRAPHIC, SECTORAL AND INDUSTRY ANALYSIS

GEOGRAPHIC ANALYSIS

Having accepted submissions from around the world and from a wide range of sectors, this Global Top 100 edition provides a revealing portrait of the geographic, sectoral, and industrial shape of today’s ecosystem of sustainable AI.

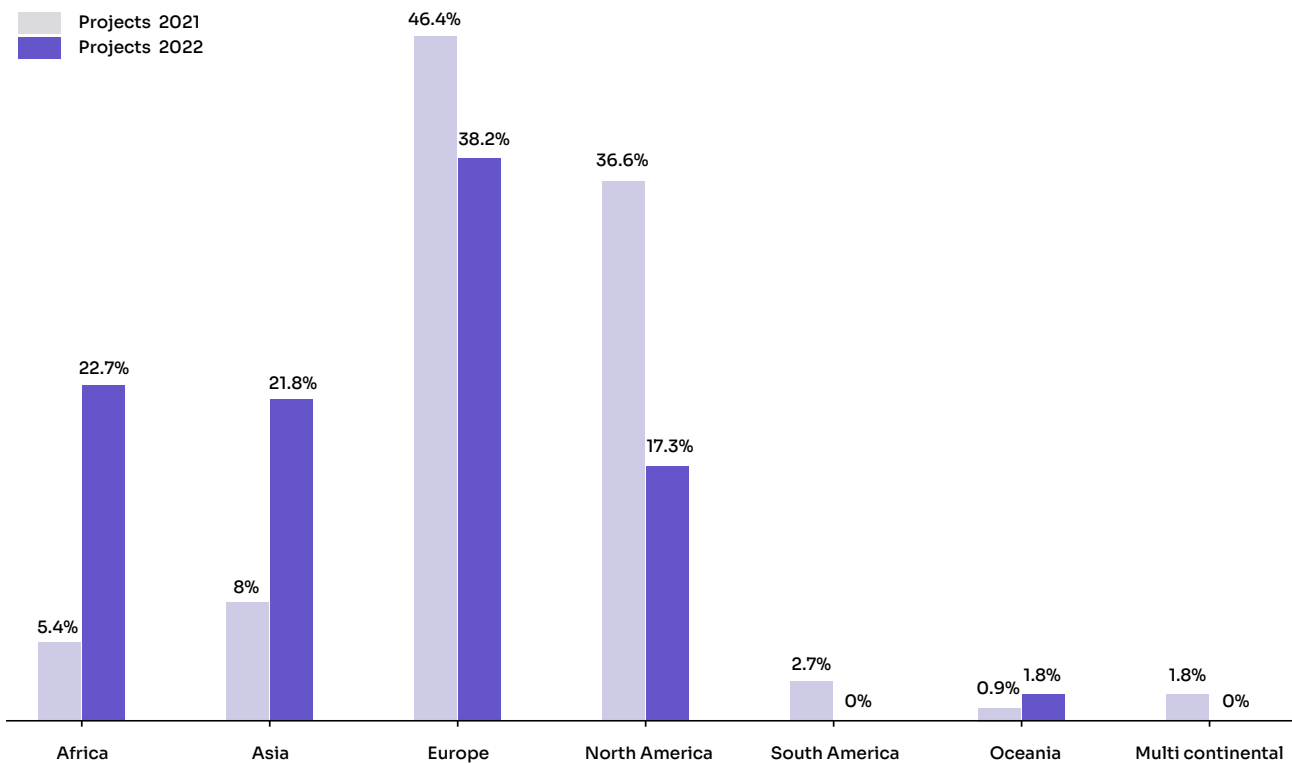


Figure 4. Continental representation across proposed applications in 2021 and 2022

Although IRCAI communications encouraged applications from all parts of the world, the majority of founding members continue to originate from the Global North. Nevertheless, **this year’s geographic distribution of submitted applications alludes to a substantial improvement in terms of variability and heterogeneity.**

INSIGHT 6

INCREASED PARTICIPATION FROM AFRICA AND ASIA

The 2022 edition of “IRCAI Global top 100” showed a significant increase in participation from Africa (17%) and Asia (13,5%) from the previous year. This increase, estimated by the project’s place of origin, is also manifested in the potential application regions of a project (Example: “Afrocentric NLP”).



GEOGRAPHIC, SECTORAL AND INDUSTRY ANALYSIS

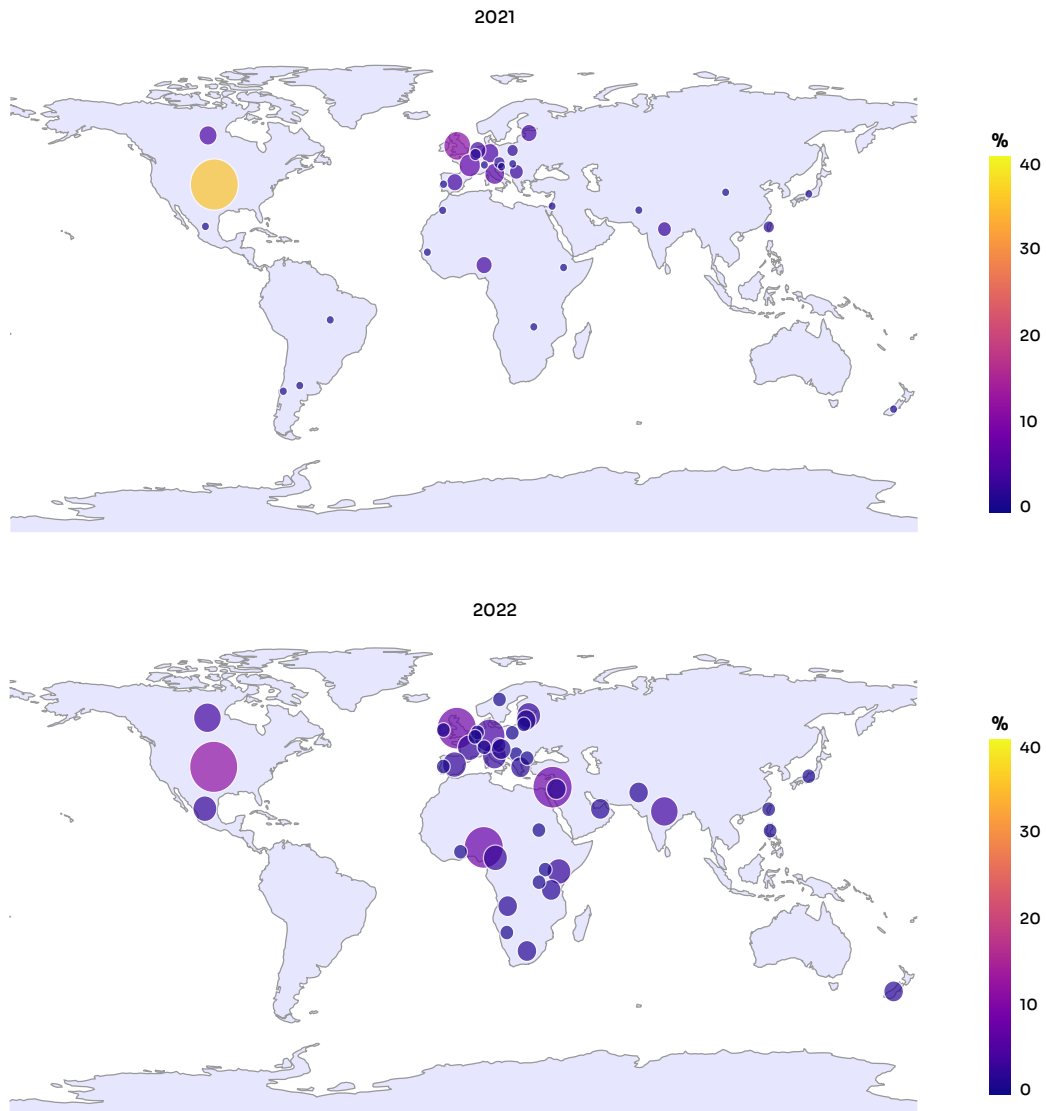


Figure 5. National representation across proposed applications in 2021 and 2022

INSIGHT 7

INCREASED DIVERSITY IN PROJECTS' ORIGIN

For the 2022 call, 22 new countries have been represented across the contributions to the Global Top 100 alongside the 23 countries that have seen participants apply in both editions so far. This amounts to a total of 45 represented countries in the 2022 edition, 12 countries more than in the 2021 edition.



This trend suggests that the IRCAI Global Top 100 call is on a good path towards its ambition of raising an international platform and entrepreneurial ecosystem of AI sustainable solutions.

While last year the lion's share of proposals were submitted by founding members in the global north (contributing roughly 80% of all submissions in 2021), these regions provided a substantial but significantly lower share of submissions in 2022 (estimated at 60%), and we see a positive trend in increasing participation from the Global South.

The swell of participation from the Global North does not come as a surprise, given the high concentration of financial, epistemological, and technological means in the region. Nevertheless, a considerable part of the Global North's contribution aims to be deployed in the Global South, thereby indirectly proliferating the benefits of these resources. However, this situation raises some concerns:

- * What kind of power relations will such a situation generate within the global AI ecosystem?
- * What sorts of biases might result from the global exportation of AI applications whose data, practices and models are fitted to the empirical conditions of the Global North?
- * How can humanity, and IRCAI in particular, foster the local design and development of SDG-oriented AI solutions in the global south? This extends to, at least, using algorithms and datasets from the global south that are built, curated and exploited by professionals from the global south.

Though we only highlight these concerns here, they remain important brightlines that professionals and practitioners leveraging AI for the SDGs should likely keep in mind.

DISCUSSION 1

LOCAL CONTEXT INTELLIGENCE FOR AI SOLUTIONS

Biased AI solutions scandals abound, from gender bias in recruitment processes, to historical and racial bias in the assessment of recidivism rates in the judiciary system. While building SDG oriented AI solutions actions must be taken to avoid these types of risks, *a fortiori* when solutions implemented in one part of the world are designed and developed in another.

This difference between regions is not only geographical; it is cultural, societal, judicial, idiosyncratic; in brief, it is human. This only exacerbates the need for SDGs-oriented AI solutions to be aligned with ethical frameworks such as UNESCO’s recommendation on AI Ethics, though the journey does not end there.

These ethical foundations could also be significantly bolstered by **local context intelligence**, improving the developer’s understanding of the facts and features of an AI’s context of deployment, and in turn, greatly reducing the risk of bias in an AI’s design.



SECTORAL ANALYSIS

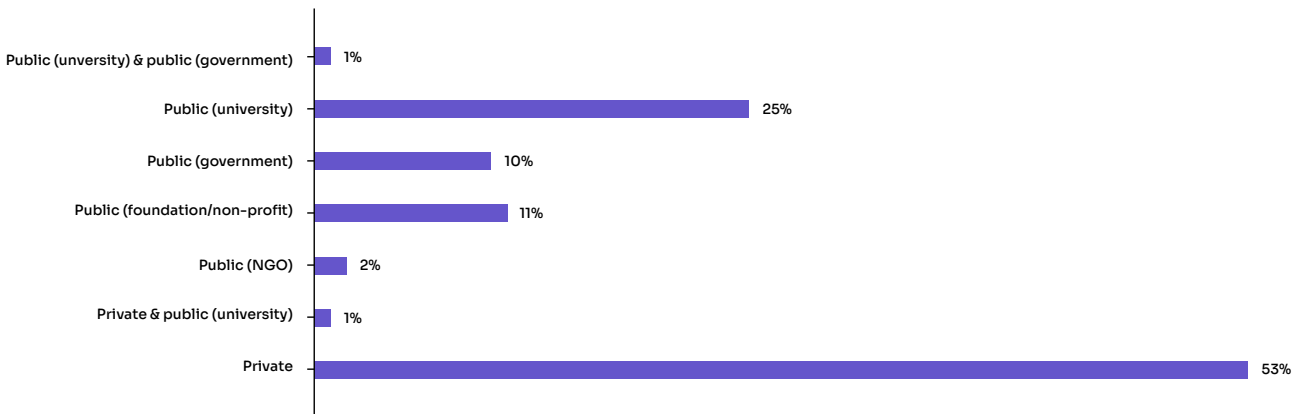


Figure 6. 2022 sectoral representation across proposed applications

The organization type representation across the proposed applications of this call edition highlights, once again, the dominance of private-sector-born projects. While in 2021, these comprised roughly 65% of submissions, applications submitted by private AI companies and private-majority AI ventures continue to account for an absolute majority at 58%. Yet, the fair share of projects from public institutions such as universities and governmental and non-profit organizations (above 10%) indicate that the AI for SDGs tech space is more than just burgeoning across various sectors.

INDUSTRY ANALYSIS

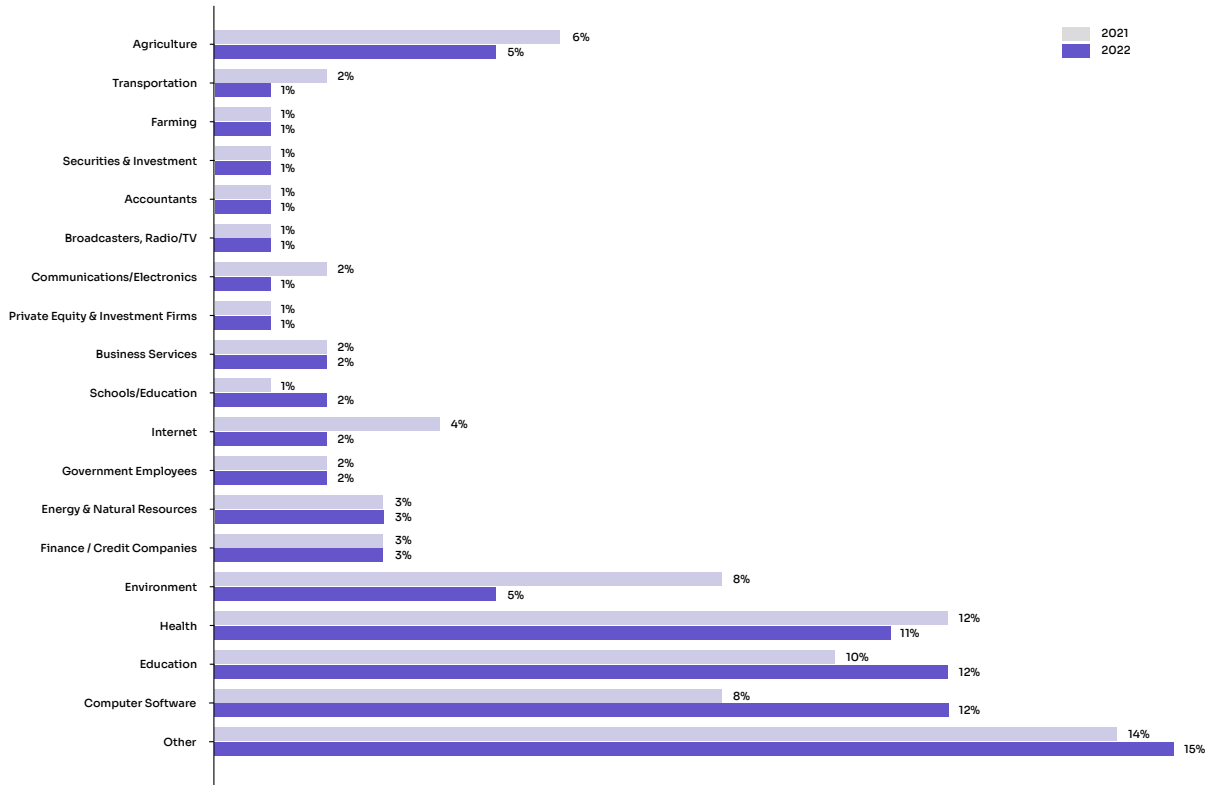


Figure 7. Category representation across proposed applications in 2021 and 2022

The industry category distribution across the 2022 cohort indicates a slight decrease in heterogeneity. While in 2021, a total of 23 industry categories were represented, this number has slimmed down to 17 in 2022.

Still, selected industry categories that have been highly represented in last year’s inaugural edition of IRCAI Global Top 100, continue to take the lead in this year’s call. Projects from “Computer software”, “Education”, “Health” and “Agriculture” persistently rank high. The most relevant difference is expressed in the “Environment” category, where the participation increased by almost 100%, something remarkably manifested by the **Biodiversity cluster**.

Ostensibly, a variety of reasons could be behind the concentration of submissions in these sectors, for example:

- * These sectors presumably continue to attract investment in sector-specific AI applications, which is clearly the case for “Computer Software”, “Education” and “Health”.
- * These sectors can base themselves more easily on financially viable AI solutions, which is clearly the case for “Computer Software”.
- * These sectors find a higher level of maturity in the related AI technologies, which is clearly the case for “Computer Software” and “Health”.
- * These sectors have experienced a hype in recent years, not dissimilar to the Ed-Tech and Agri-Tech hypes.

1.4 Results

GENDER DISTRIBUTION

AI and its underpinning algorithms are nowadays employed in ways that have a far-reaching and direct impact on our lives. Algorithms do not only determine our Spotify playlists, but are also increasingly called upon to design educational curricula, national policies or even to advise us on our personal finances. However, if we fail to diversify the set of people working on these AI innovations, we will only further entrench existing biases and inequalities as new technologies are being developed. This is of especial concern in gender issues.

GENDER DISTRIBUTION

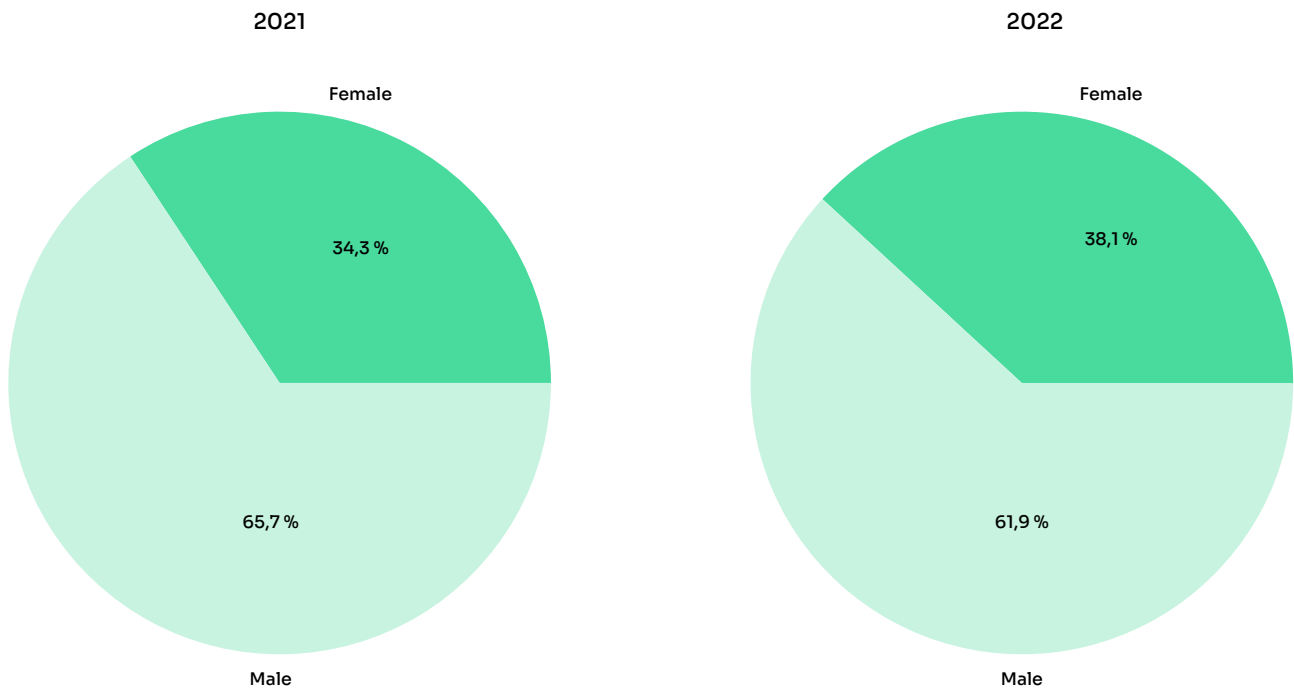


Figure 8. Gender representation across proposed applications in 2021 and 2022

In line with the realities of the modern-day tech space, this year's edition is still characterised by predominantly male participants. Among all founding members of the 2022 cohort, roughly 38% are female, representing a 4% increase compared to the 2021 edition.

INSIGHT 8

WOMEN PARTICIPATION IS CONSIDERABLY HIGHER THAN RELEVANT BENCHMARKS

By 2020, in the United States, women accounted only for 22% of all AI and computer science PhD programs in North America, just 4% higher than in 2010 (Deloitte, 2021). Similarly, according to the European Commission's 2020 Women in Digital (WiD) Scoreboard, only 18% of ICT specialists in Europe are women.

In contrast, IRCAI Global Top 100 accounted for 36.1% of female participation across the two editions. This is also highlighted among the highly ranked projects. Examples of female-led remarkable projects are “Afrocentric NLP”, “MALENA” and “Mobius: Artificial intelligence for scalable and standardised whale monitoring”.

Having gathered a substantial community of female founding members in this edition's platform, IRCAI intends to keep this trend growing throughout further editions, as a way to boost the share of women participating in advancing the SDGs through the development, deployment and use of AI.



1.5 Results

OTHER OBSERVATIONS

OTHER OBSERVATIONS

PROJECTS NEEDS AND REQUIREMENTS

As part of its efforts to foster an entrepreneurial ecosystem of global reach and impact, a large part of IRCAI’s work also lies in making this ecosystem as fair as possible, where all participating projects have a say. It is therefore of utmost importance to understand the needs and requirements of (especially the early-stage) projects in order to work towards their sustainability objectives:

- * Are the founding members in search of an adequate mentorship programme?
- * Were they able to interact with relevant stakeholders?
- * Are they looking for more personnel to join their ventures? What would they need funding for?

This is why participants were asked in the project proposal to indicate their most pressing needs.

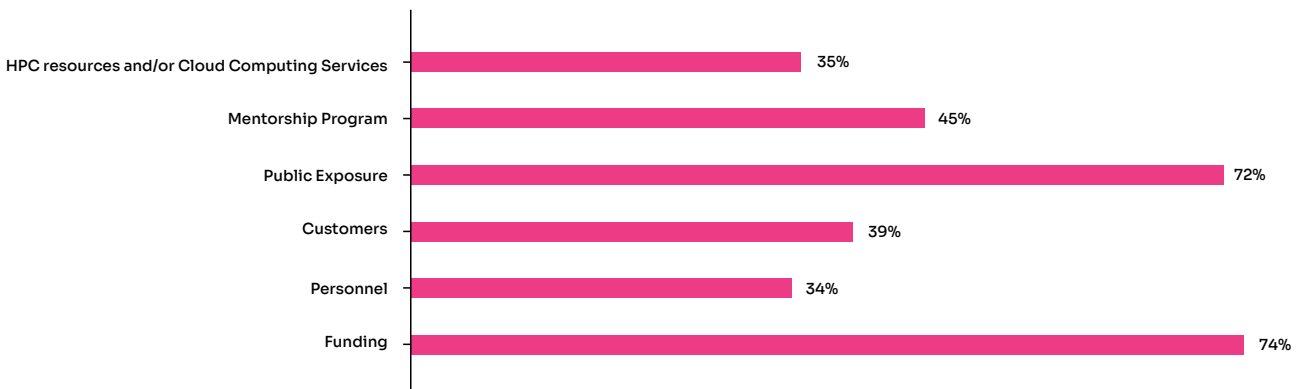


Figure 9. Most commonly cited requirements across proposed applications in 2022

The most commonly selected requirements were funding and public exposure, representing 74% and 72% percent of all project proposals respectively. This is followed by mentorship (around 50%), customers (around 43%) and personnel (around 37%).

GITHUB

GitHub remains the world’s most used software development collaborative platform. This service provides a great way of showcasing AI projects, nurturing collaboration and storing repositories. For this call, IRCAI gave submitting parties the option to share their GitHub content as part of their project proposal, such that the reviewers could access the prototypes. However, the GitHub accounts also served as a great proxy to estimate the maturity of the proposed applications, as well as the level of expertise of the associated team.

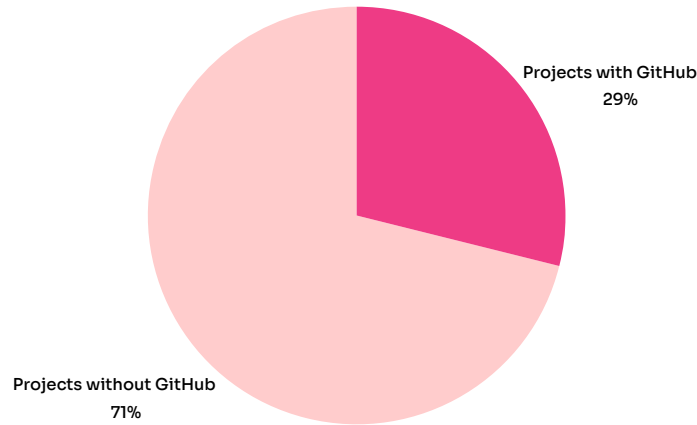


Figure 10. Percentage of proposed applications with a Github account in 2022

Roughly, a bit more than 25% of the participants seized the opportunity to share a link to their GitHub. This proportion correlates with the proportion of excellent projects, however, this is not necessarily a causal relation.

NEWCOMERS V. RETURNING APPLICANTS

Continuously engaged in the sustainable tech platform which emerged in the wake of last year’s inaugural IRCAI Global Top 100 edition, a substantial share of the 2021 cohort submitted an application to this year’s call too. These account for 17% of all applications.

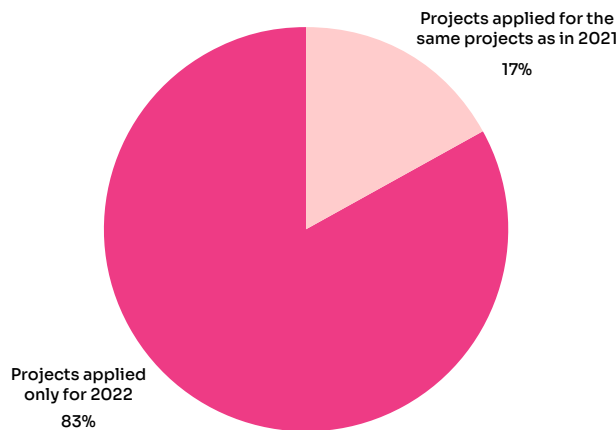


Figure 11. Percentage of proposed applications which already featured in the 2021 cohort

OTHER OBSERVATIONS

PROJECTS BUILDING DATASETS

An estimated 66% of project proposals in the 2022 edition have, in fact, placed a special focus on building and/or expanding datasets to be able to serve their SDG oriented AI projects and ventures. Some of these datasets could be of great benefit to assess the state of advancement of a particular SDG. However, this requires a deeper, case-by-case analysis.

DISCUSSION 2

FOSTERING A DATA SHARING CULTURE FOR SDGS ALIGNED AI SOLUTIONS

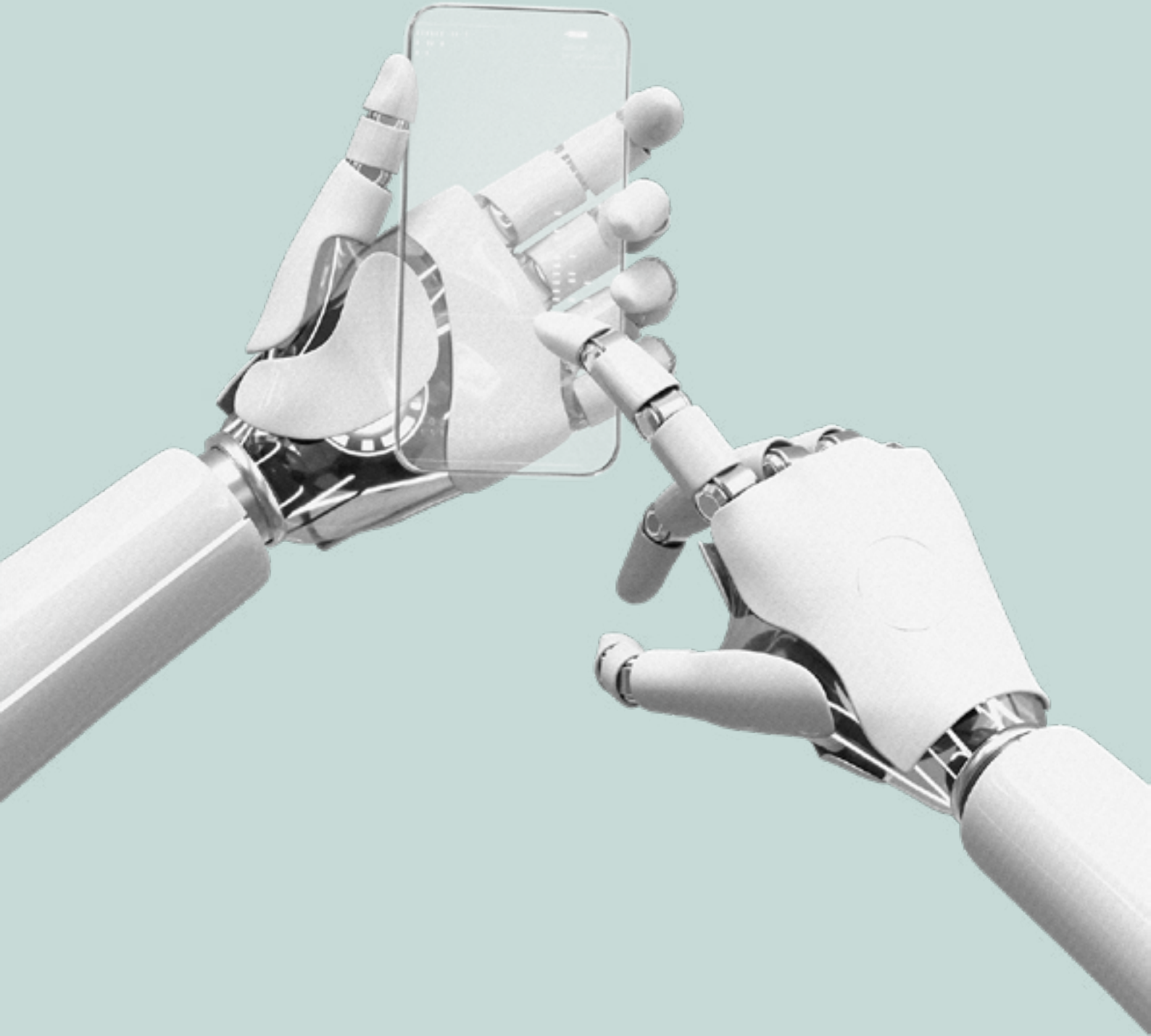
There are many projects building datasets of high potential to assess the state of advancement of a particular SDG, and to build SDGs aligned AI solutions. Examples are the “Biodiversity”, “ESG and impact investment” or “Policy and Regulation” clusters.

We are faced with a huge opportunity for collaboration and sharing, with a common objective to contribute to the SDGs.

How we can foster this emergent data-sharing culture among the applicants, and build the required protocols, among others, is a topic IRCAI is poised to tackle.

OTHER OBSERVATIONS





PART 2.

The 2022 Ranking

2.1 Outstanding Projects

10 PROJECTS



The IRCAI Scientific Program Committees and IRCAI Scientific Journal Editorial Board selected ten solutions from the Global Top 100 project submissions as “outstanding” based on their centrality of AI, potential impact on relevant SDGs, demonstration of potential in completed work (either proof of concept or completed research paper), and ethical design. We will now briefly introduce these outstanding projects.



COLLECTIVE LEARNING: HUMAN-MACHINE COLLECTIVE INTELLIGENCE AT SMART CITY SCALE

With this project, the EPOS team proposes an AI-powered approach to improve the coordination of collective decision-making in smart cities. Issues such as power outages, traffic congestion or overcrowded parking lots are all the result of coordination deficits between humans. The project aims to overcome these deficits through scalable, automated information exchange between citizens. Based on collective learning, the project is implemented using open-source data, distinguishing it from traditional supervised AI solutions that are trained on large amounts of personal data. “What’s unique about these optimized decisions altogether is that they can load-balance and improve the efficiency, while meeting a broad spectrum of Sustainable Development Goals”, notes the team behind this project.

Visit at <https://epos-net.org/>.

NOWCASTING OF SOLAR ELECTRICITY PRODUCTION

This project by Open Climate Fix provides an open-source solution for the short-term forecasting (also known as “nowcasting”) of solar photovoltaic energy production. “Traditional weather forecasts are not optimised for forecasting solar irradiance and are slow to run”, observes the team, pointing at how forecasts for a mere couple of hours ahead become obsolete as soon as they are produced. Basing itself on real-time geostationary satellite imagery with historical solar power generation levels, this Open Fix uses state-of-the-art AI techniques to produce more accurate and regularly updated forecasts of photovoltaic energy production for short time scales.

Discover at <https://www.openclimatefix.org/>.



MBAZA AI

Mbaza AI offers an open-source algorithm that enables a large-scale monitoring of biodiversity trends in remote ecosystems, even without a reliable internet connection or advanced hardware. This innovative solution offers a comprehensive solution for restructuring camera trap-based biodiversity monitoring, making it accessible and efficient in remote areas with limited resources. The algorithm enabled park rangers to shorten the time a typical batch of collected data takes to be processed from weeks to hours.

Discover at <https://appsilon.com/data-for-good/mbaza-ai/>.



RESEARCHER WORKSPACE

Iris.ai consists of an AI-based platform for research document processing. With 6000 new papers being published everyday, the team departs from the thought that “staying on top of and connecting all of this knowledge is impossible”. The NLP architecture designed to detect and manipulate the scientific text does not require large computational resources and packages its ML models in a client-friendly manner, adapting content to the specific domain of the client and requiring minimal human interaction.

Discover at <https://iris.ai/>.

AFROCENTRIC NLP

AfroLID marks a milestone in working towards a more Afrocentric approach to technology development, enabling technologies to be built, evaluated and deployed according to the needs of local African communities. Based on a neural language identification toolkit for 517 African languages and varieties, the project gives rise to a multi-domain web dataset from 50 African countries, covering 14 language families and five orthographic systems. “Developing AfroLID tools is vital for all natural language processing (NLP) since automatic language identification (LID) is an important first step in processing human language appropriately”, remarks the founder of the project.

Discover at <https://afrolid.readthedocs.io/en/latest/>.



MOBIUS: ARTIFICIAL INTELLIGENCE FOR SCALABLE AND STANDARDISED WHALE MONITORING

Mobius offers an AI-assisted system aimed at detecting, locating and classifying whales. “Whales are long-lived carbon reservoirs”, explains the team. Whales supply nutrients for phytoplankton growth and therefore play a vital role in absorbing global CO2 emissions. By conducting image analysis based on remote aerial imagery, this project can greatly assist humans in their efforts to reduce harm to wildlife. As current whale monitoring methods are still largely based on manual aerial imagery analysis, it can substantially improve the quality of annotations and reduce inaccuracies.

Discover at <https://www.whaleseeker.com/>.



MALENA (MACHINE LEARNING ENVIRONMENT, SOCIAL AND GOVERNANCE ANALYST)

With MALENA, its founding members developed a powerful AI tool to inform financial institutions, credit agencies, private equity funds but also individual investors striving to compose SDG-aligned investment portfolios. The tool can rapidly identify environmental, social and governance (ESG) risk terms in text developed by the International Finance Corporation, based on which it then conducts sentiment analysis to assign a positive, negative or neutral sentiment in the relevant context. Its founding members explain: “MALENA complements traditional ESG data providers where coverage is missing, increases analyst productivity, enhances risk identification, and improves ESG integration.”

Discover at <https://www.ifc.org/sustainability/malena>.

PACHAMA ORIGINALS

Pachama Originals is a project that harnesses the combined power of AI and satellite data to monitor how much carbon is stored in forests and how forests change over time and informs companies on investments in carbon credits. Banking on its earlier developed technology, Pachama has recently expanded its scope by providing evidence-based insights to investors on project origination and transparency around community and biodiversity benefits. As put by the founding members, “Pachama enables corporate leaders to invest in their own high-quality forest projects from the ground up, secure credits to reach Net Zero, and make a transformative impact on communities and ecosystems for generations to come”.

Discover at <https://pachama.com/originals/>.



OUTSTANDING PROJECTS

ARTIFICIAL INTELLIGENCE-BASED REFERRAL SYSTEM FOR PATIENTS WITH DIABETIC RETINOPATHY IN JALISCO

This project provides an inspiring example of an AI-based referral system for patients with diabetic retinopathy. Aware of the high prevalence of diabetes and a shortage of ophthalmologists and eye illness detections services in the Mexican State of Jalisco, the founding members of this project developed an AI model based on deep convolutional neural networks (DCNN) to enable a timelier detection of Diabetic Retinopathy in people’s eyes. The trained models preprocess and evaluate the suitability and quality and classify relevant ocular documentation with an exceptional specificity and sensitivity on local data.

Discover at <https://innovacion.jalisco.gob.mx/>.



CLIMATE FINANCE ACCOUNTING VIA ARTIFICIAL INTELLIGENCE

This project consists of an AI model that allows users to identify whether a project is relevant for climate finance and what climate-relevant purpose it contributes to – be it climate adaptation, solar energy or any other purpose. The model has by now been applied to 2.7M+ project descriptions. “Currently, contributing nations are reporting their climate flows without independent verification checks.”, notes the founding member. The model could reverse this trend by flagging projects that have either been omitted by reporting contributors or potentially been over-reported.

Discover at <https://rdcu.be/cV7sP>.

2.2 Excellent Projects

20 PROJECTS



The 2022 Global Top 100 edition provided many first-class projects, making the review and ranking process enriching and difficult. IRCAI wants to highlight twenty excellent projects, five with special mentions due to their particular impact and domain of action.

EXCELLENT PROJECTS



TECH-GEST : AI-BASED ASSET MONITORING FRAMEWORK

TECH-GEST offers a ML-based tool to monitor assets and infrastructure. Based on GIS data from satellite and drone imagery, it provides a great solution to monitor construction projects, control land use and manage assets.

Discover at https://ggpen.gov.ao/?page_id=6238.

HORTICULTURE & AGRI QUALITY ASSAYING SOLUTIONS TOOLS AND MACHINES

This project harnesses the power of AI and computer vision to measure the visual quality of horticultural and agricultural produce. The tool streamlines and automates quality assessment to inform buyers and sellers across fruit, vegetable and spice markets.

Discover at <https://www.praman.ai/>.

SENTINEL - SMART AI FOR WILDLIFE CONSERVATION

Sentinel provides a great example of an AI application for wildlife conservation. By plugging its devices into existing environmental sensors (such as trail cameras), Sentinel’s AI models automatically identify vulnerable species and/or poachers.

Discover at <https://sentinel.conservationxlabs.com/>.

EARS - EARLY AI-SUPPORTED RESPONSE WITH SOCIAL LISTENING

EARS (Early AI-supported Response with Social Listening) is an AI-powered platform aimed at tackling mis- and disinformation on COVID-19, vaccines and other health-related issues. By collecting citizens’ opinions in real time, it “listens to people’s questions and concerns” on public health trends.

Discover at <https://www.who-ears.com/#/>.



SPECIAL MENTION HEALTH TECH

AI-BASED DICOM VIEWER

This team developed an Deep Learning-powered DICOM (Digital Imaging and Communications in Medicine) viewer, helping radiologists diagnose diseases ranging from breast cancer, brain cancer, to tuberculosis by means of mammograms, chest X-rays and brain MRI images.

Discover at <https://midl.comsats.edu.pk>.



AI_PREMIE (ARTIFICIAL INTELLIGENCE TO PREVENT PRETERM BIRTH DUE TO PREECLAMPSIA WHILE PROTECTING MOTHERS’ LIVES)

AI_PREMie offers a novel decision-support system aimed at facilitating the diagnosis and risk stratification in preeclampsia. The system banks on cutting-edge biomedical, clinical and machine learning know-how.

Discover at <https://aipremie.com>.

AI-BASED COMMUNITY ENGAGEMENT PLATFORM AND ANALYSIS BY CITIZENLAB

CitizenLab developed an inspiring digital community engagement platform harnessing the power of Natural Language Processing (NLP), Machine Learning (ML) and data visualization algorithms. The platform was in particular designed to promote civil participation through digital engagement projects and understand community interests.

Discover at <https://www.citizenlab.co>.

UTIL SUSTAINABILITY ANALYTICS

Util provides financial institutions with an AI-based analytics tool to capture the performance of 50k+ listed companies relative to the 17 UN SDGs - empowering investors to better understand and optimise their real-world impact.

Discover at <https://util.co>.



ENVIRONMENTAL INTELLIGENCE SUITE

The Environmental Intelligence Suite by Breeze Technologies seeks to harness the power of AI-enabled sensors to help cities better monitor and improve urban air quality levels.

Discover at <https://www.breeze-technologies.de>.



SPECIAL MENTION AGRITECH

DEEP LEARNING TOOLS FOR EARLY DETECTION OF DISEASES AFFECTING COMMON BEAN AND IRISH POTATO IN THE SOUTHERN HIGHLANDS REGIONS OF TANZANIA

This project by the Nelson Mandela African Institution of Science and Technology provides a noteworthy Deep Learning tool aimed at enabling an early detection of various diseases affecting crops in the Southern Highlands Regions of Tanzania. Based on leaf imagery data, it informs farmers on how to curb the spread of the diseases.

Discover at <https://nm-aist.ac.tz>.



ARBIMON

Arbimon presented us with an inspiring AI-based approach to evaluate the impacts of land use and climate change on biodiversity - providing a great example of how academia and conservation managers can join forces to extract ecological insights from acoustic data.

Discover at <https://www.rfcx.org>.

PLUTO

The Pluto project will lay the foundation for the first global volcanic activity early-warning system. Building upon a previous research prototype system that exploits freely available satellite data, it harnesses the power of AI and computer vision to providing warnings of possible eruptions well in advance.

Discover at <http://orionlab.space.noa.gr/>.

BRIINK

Briink’s NLP-based solution automates the analysis of SFDR (Sustainable Finance Disclosure Regulation) and EU Taxonomy analysis. As such, it enables businesses and financial institutions to bridge their imbalances through APIs relying on pertinent ESG data from various datasets.

Discover at <https://briink.com>.

AI-POWERED TOOLS FOR CLIMATE LAW AND POLICY DATA RESEARCH

This project by Data Scientist Network (Data Science Nigeria) mobilises state-of-the-art NLP methods to scale and automate the identification and analysis of a wide range of data about climate legislation.

Discover at <https://climatepolicyradar.org/>.



SPECIAL MENTION AI ETHICS

RESPONSIBLE HUMAN-CENTERED AI IN AFRICA (RHAI-AFRICA)

RHAI-AFRICA aims to design and implement an Afrocentric, human-centered educational platform powered by AI. By providing theoretical and practical support to the African responsible AI ecosystem in Africa, it will support its users (entrepreneurs, innovators, academics, students and startups) to learn and engage in responsible AI discussion.

Discover at <https://www.linkedin.com/company/responsible-human-centered-ai-design-in-africa-rhai-africa/>.



AN AI SOLUTION TO REDUCE HEALTHCARE INEQUALITIES AND THE IMPACT OF COVID-19

MedCheX’s AI system is built to automatically detect high-risk patients with pneumonia and/or COVID-19. The obtained information then enables doctors to make decisions and provide a tech-aided treatment plan for the diagnosis.

Discover at <https://medchex.tech/>.

HOW DATA SCIENCE AND AI CAN REDUCE GENDER BIAS AND CONCURRENTLY INCREASE PROFITABILITY

ADI’s project serves a solid proof of how Machine Learning can be harnessed to progress towards a better gender equality. The team behind this project simulated the impact of different anti-discrimination laws present globally on gender discrimination in the non-mortgage fintech lending setting.

Discover at <https://doi.org/10.1287/msom.2022.1108>.

SPECIAL MENTION WATER, SDG 6

SMARTEX AI BASED INSPECTION SYSTEM

Smartex is an AI system based on machine vision and aims to identify and classify defects in textiles. By detecting defects from as early as at the point of production, the system can significantly reduce production waste and water pollution.

Discover at <https://smartex.ai/>.



SPECIAL MENTION TRANSVERSAL IMPACT

HOLIS

Holis leverages the power of AI to conduct data collection on the life cycle of various products and provide stores with recommendation to reassess their product catalogs.

Discover at <https://holis.earth>.



RULEWATCHER

RuleWatcher's web service offers a NLP-based data analytics tool to make full use of information originating from governments, UN organisations and NGOs.

Discover at <https://en.osintech.net/>.

2.3 Promising Projects

21 PROJECTS



PROMISING PROJECTS

CLIMATE RESILIENCE DIGITAL TWIN

Discover [here](#).

BÜROKRATT

Discover [here](#).

NOVEL MACHINE LEARNING APPROACH FOR CREDIT RISK ASSESSMENT USING NON-TRADITIONAL DATA SETS

Discover [here](#).

GOVERLTYICS

Discover [here](#).

LEARNISA

Discover [here](#).

ARTIFICIAL INTELLIGENCE TECHNIQUES TO TACKLE URBAN AIR POLLUTION

Discover [here](#).

BULLYBUSTER – A FRAMEWORK FOR BULLYING AND CYBERBULLYING ACTION DETECTION BY COMPUTER VISION AND ARTIFICIAL INTELLIGENCE METHODS AND ALGORITHMS

Discover [here](#).

PIONEERS FOR AI

Discover [here](#).

MINERVA

Discover [here](#).

DICOM-X

Discover [here](#).

COLLECTION OF DISPOSABLE E-CIGARETTES AND BATTERIES

Discover [here](#).

KAIT SOLUTIONS FROM KNOWLEDGE AI

Discover [here](#).

PARTICIP.AI CCC – CRISES CONTACT CENTER AND HELPDESK FOR PEOPLE IN NEED OR WITH DISADVANTAGES

Discover [here](#).

PROTECTING ONLINE COMMUNITIES

Discover [here](#).

BE-INTACT

Discover [here](#).

A.I. FOR GOOD FRAMEWORK TO EMPOWER DIGITAL WORKERS

Discover [here](#).

OSDG

Discover [here](#).

AGRIX TECH

Discover [here](#).

GLOBAL INDEX ON RESPONSIBLE ARTIFICIAL INTELLIGENCE

Discover [here](#).

SUSTAINABLE INFRASTRUCTURE MANAGEMENT USING CITYROVER AI

Discover [here](#).

AFRIHATE: HATE AND OFFENSIVE SPEECH DETECTION FOR AFRICAN LANGUAGES

Discover [here](#).

2.4 Early Stage Projects

48 PROJECTS



EARLY STAGE PROJECTS

TRACE.AI PROJECT

Discover [here](#).

IMPROVE DIAGNOSTICS OF TYPHOID THROUGH OPEN SCIENCE: AN ARTIFICIAL INTELLIGENCE-BASED TECHNIQUE

Discover [here](#).

DKNO

Discover [here](#).

REMOSENSE

Discover [here](#).

OCEANOGRAPHIC DASHBOARD

Discover [here](#).

AI POWERED OPERATING SYSTEM FOR NATIONAL EDUCATION

Discover [here](#).

AI-POWERED SMS FRAUD DETECTOR AND INSTANT FRAUD PREVENTION CALL ALERT

Discover [here](#).

X5GON: CROSS MODAL, CROSS CULTURAL, CROSS LINGUAL, CROSS DOMAIN, AND CROSS SITE GLOBAL OER NETWORK

Discover [here](#).

INTELLIGENT SYSTEM TO INCREASE ROAD SAFETY

Discover [here](#).

DAVINCI

Discover [here](#).

BREAST LESIONS DETECTION VIA MAMMOGRAPHIC IMAGES PROCESSING

Discover [here](#).

AI BIAS CORRECTION VIA MACHINE LEARNING FOR CATEGORIES

Discover [here](#).

AUTOHEALTH: AUTOMATIC DEEP LEARNING SOFTWARE FOR LOW COST HEALTHCARE ASSISTANCE

Discover [here](#).

AUTOMATION OF INVESTMENT PROMOTION AT THE ESTONIAN INVESTMENT AGENCY

Discover [here](#).

SMART BUILDINGS

Discover [here](#).

VALENCIA IA4COVID

Discover [here](#).

ENERGYCONS

Discover [here](#).

BLOOD DONATION - A MOBILE APPLICATION AND WEB PLATFORM TO FIND BLOOD DONORS ONLINE

Discover [here](#).

A VERY ECONOMICAL OBJECT RECOGNITION SYSTEM FOR SERVICE ROBOTSDiscover [here](#).**AI FACIAL AGE ESTIMATION**Discover [here](#).**AN AI BASED CLASSIFICATION SYSTEM FOR AGGREGATE USING IMAGE PROCESSING AND ARTIFICIAL NEURAL NETWORK**Discover [here](#).**WARDEN MACHINERY**Discover [here](#).**AN AI-BASED CERVICAL CANCER PREDICTION USING MACHINE LEARNING TECHNIQUES**Discover [here](#).**DECOLONIZING SCIENCE**Discover [here](#).**WOLFSHEAD LEGAL SEARCH**Discover [here](#).**AGRI MEDIC**Discover [here](#).**I-BRAIN (BRAIN TUMOR DIAGNOSTICS)**Discover [here](#).**4INSHIELD**Discover [here](#).**E-AGRICULTURE BY USING AI**Discover [here](#).**AMY.APP**Discover [here](#).**USING MACHINE LEARNING TO DETERMINE PREOPERATIVE FEASIBILITY AND POSTOPERATIVE OUTCOMES OF LIVER TRANSPLANTATION**Discover [here](#).**AI-POWERED LEARNING SOCIALIZATION AND VIRTUALIZATION PLATFORM**Discover [here](#).**HUMANS IN THE LOOP**Discover [here](#).**1WB WEB3-AI E-WALLET PAYMENT PLATFORM FOR THE UNBANKED AND FEMALE POPULATION**Discover [here](#).**THINKIT SMART SPEAKER**Discover [here](#).**AI-POWERED CLASSROOM ENGAGEMENT AND LEARNING OPTIMIZATION SYSTEM**Discover [here](#).**REACT - REACCOMPANYING CHAIN TRANSFORMATION**Discover [here](#).**A FRAMEWORK FOR DESIGNING STUDENT SUPPORT STRATEGIES IN HIGHER EDUCATION INSTITUTIONS USING AI**Discover [here](#).**JET UNLEASHING THE POTENTIAL OF YOUTH IN THE CARIBBEAN**Discover [here](#).**AN ASTRONOMICAL PROJECT SPECIALIZED IN ASTRONOMICAL TOURISM AND ASTRONOMY EDUCATION WITH VR, AR . FEATURE**Discover [here](#).**TELEPORTING VIRTUALLY TO PALESTINIAN HISTORICAL LOCATIONS**Discover [here](#).**BITSKOUT**Discover [here](#).**SMART AND PROFITABLE GARBAGE CAN**Discover [here](#).**AXLE SHAFT WIND TURBINE**Discover [here](#).**THE MERANTIX VENTURE STUDIO**Discover [here](#).**SMARTCITY**Discover [here](#).**SISTEMA DE CONTROLE DE ACESSO POR RECONHECIMENTO FÁCIAL**Discover [here](#).**TOWARDS A GREEN METAVERSE ERA**Discover [here](#).

Conclusion

The 2022 edition of the IRCAI Global Top 100 has demonstrated the remarkable progress and growth of the program in both the quality and quantity of proposals received. With proposals covering all 17 SDGs across multiple sectors and all five geographic regions, it is clear that the use of artificial intelligence (AI) in sustainable development has become a thriving area of innovation for organizations worldwide.

The submissions analyzed this year have shown that the sustainable tech space is a diverse and engaging international environment for sustainable applications, and it has become a global hub for entrepreneurial activities with significant impact. This progress is a promising sign for the future of sustainable development and AI, and we look forward to seeing the continued growth of this important field.

Over the past few months, the world has been shaken by a new wave of AI innovations in the form of so-called ‘foundational’ or General Purpose AI (GPAI) models (Generative Models, Large Language Models, and others). As with the dawning of other ‘AI Springs’ in the past, these breakthroughs will dramatically augment the methods by which AI is harnessed to the pursuit of a variety of human ends.

Ostensibly, these models have the potential to further democratize the use and accessibility of AI tools, further entrenching their role in the pursuit of the Sustainable Development Goals. Nonetheless, there exists great skepticism

concerning the adverse effects of these models, and their potential impact on society. Just as they are capable of accelerating meaningful progress, so too are they capable of exacerbating a host of rights and ethics-based concerns; from systemic biases, privacy concerns, and in extremis, to the erosion of critical thought, knowledge, and democratic values on a global scale.

In future cohorts of the Global Top 100, it is therefore incumbent on IRCAI to pursue its aims of showcasing the good work of the sustainable tech space, acting ever more as an ombudsman for the delicate principles and values that might, if not properly addressed, be left by the wayside of break-neck technical progress. This is part of our challenge to keep playing a crucial role in fostering a sustainable tech ecosystem for research and entrepreneurial activities with a significant positive impact. IRCAI remains committed to this role and looks forward to the innovative results that next year’s call will surely bring.

