

G6 RECOMMENDATIONS FOR THE FUTURE EUROPEAN STRATEGY FOR ARTIFICIAL INTELLIGENCE IN SCIENCE

Artificial intelligence (AI) is fundamentally changing the way scientific research is conducted. It enables the analysis of huge amounts of data, the automation of complex processes and the development of predictive models, leading to ground-breaking advances. These capabilities are having a profound transformative impact on the entire research landscape and revolutionising fields such as health, climate science, physics, materials engineering, among others.

Developing AI and respective applications within the EU is essential for promoting competitiveness and autonomy, upholding European values and ensuring ethical and data protection standards.

In order to ensure the effective application of AI across scientific domains to boost scientific competitiveness, **the EU must also ensure that it remains at the forefront of AI development** itself. **Developing AI capabilities within the EU is a prerequisite to maintaining leading position.** Strategic support for open infrastructures, talent attraction and training, and international collaboration will drive excellence in foundational and applied AI research. Investing in home-grown AI solutions reduces strategic dependencies on third countries, reinforces data sovereignty, and strengthens EU's global leadership in responsible and cutting-edge scientific innovation.

The G6 recognizes **the need for a robust European Strategy for AI in Science**. For each strategic priority identified below, the G6 presents a corresponding set of concrete measures, ensuring that every aspect of the strategy is directly supported by actionable initiatives.

First of all, The EU must **strengthen fundamental research in core AI disciplines**. The success of a solid foundation in AI relies first and foremost on strong support for mathematics and computer science, which foster the theoretical and technical advances at the heart of AI.

- To this end, the G6 calls on the EU to **significantly increase funding for fundamental research disciplines that underpin all innovation in AI**. This includes dedicated support for long-term, curiosity-driven research in mathematics and computer science, as well as mechanisms to sustain the research environments—institutes, laboratories, and teams—where core AI breakthroughs are made. Strengthening these foundations is essential to ensure EU's capacity to lead in the development of trustworthy, robust, and cutting-edge AI technologies

To address disparities in expertise across regions, **an intra-European mobility scheme** modelled on successful programmes such as Marie Skłodowska-Curie fellowships should be implemented. This scheme would facilitate skill exchanges between Member States while targeting regions with less advanced AI capabilities. By fostering researcher mobility, this initiative seeks to bridge gaps identified in the Coordinated Plan on AI regarding uneven talent distribution.

- To achieve this, the G6 proposes a comprehensive approach combining several measures: the implementation of **Researchers Exchange Programmes** to facilitate both short- and long-term research visits between institutions, with financial support for travel and accommodation; the organisation of **Joint training and development activities**—such as workshops, summer schools, and specialized training programmes—to promote skill-building and foster international networks; and the **Joint supervision of doctoral students** with mobility grants enabling doctoral students engaged in joint supervision arrangements to benefit from guidance by experts in both AI and other scientific disciplines, often across different institutions or countries. This should be organized in close collaboration with the existing ELLIS PhD co-supervision program

A central aspect of this strategy must be **the creation of interdisciplinary innovation platforms** to integrate high-performance computing resources, sector-specific datasets, and expertise from academia and industry to address critical challenges such as healthcare advancements, energy efficiency, and cultural heritage preservation. For example, multilingual AI models could enable seamless access to Europe's historical archives, ensuring the preservation of its cultural heritage across linguistic boundaries. Public-private co-financing mechanisms will support these platforms, ensuring their scalability and sustainability.

- To support this, the G6 recommends establishing **shared Computational Resources and Data Infrastructure** to develop a federated European AI research infrastructure, including high-performance computing resources and shared datasets, and interoperable platforms. This ecosystem should ensure compliance with EU data governance regulations. **The G6 also advocates for expanding a Common AI Research Platform** to serve as a central hub (such as the AI-on-Demand Platform) for accessing, sharing, and validating AI tools, datasets and services. This platform would connect seamlessly with the underlying infrastructures and provide standardised benchmarks, best practices, and support for both academia and industry.

Cross-domain expertise is central to this effort. The participating organisations bring diverse strengths across fields such as healthcare, climate science, physics, and materials engineering. This diversity enables advancements in fundamental AI research to directly inform real-world applications while ensuring that applied innovations are grounded in robust theoretical foundations. By contributing insights to policymakers, this collaboration aims to shape governance frameworks that support innovation while maintaining EU's leadership in responsible AI development.

- To enable this, the G6 proposes **Collaborative Research initiatives** which would be a financial support for joint European research projects with shared infrastructure and datasets, focusing both on the fundamentals of AI and on AI applications, such as the use of AI in science. Additionally, **the joint supervision of doctoral students** will further promote interdisciplinary projects and training by enabling candidates to benefit from expertise across multiple institutions and scientific fields.

Another priority is the **establishment of EU-wide AI research standards** to support the European Green Deal. This includes systematically assessing the environmental impact of AI projects using standardised audit tools and adopting best practices for optimising neural architectures to reduce energy consumption. Shared methodologies, infrastructures, and ethical guidelines should be developed to foster collaboration across Member States while supporting the responsible deployment of AI technologies.

- To address this, the G6 advocates for the development of a **Policy and Ethical AI Framework**, complementing existing efforts on the EU level, such as the [Living Guidelines on the responsible use of generative AI in research](#). The G6 will engage in developing guidelines, standards and recommendations for the responsible development of AI, organising forums for policy contributions at EU level, and developing frameworks for integrating AI into scientific decision-making processes while ensuring transparency and fairness. Finally, the use of G6's cross-domain expertise can serve as an ideal testing ground for the implementation of the European Strategy on AI in Science.

Finally, the **use of AI in science** contributes to the EU's efforts in **reducing strategic dependencies on third countries, reinforcing data sovereignty, and consolidating its position as a global leader in cutting-edge scientific innovation**. Building on the foundation of trustworthy AI, the integration of AI into scientific research will enable researchers to process complex databases and accelerate breakthrough discoveries.

By translating results from fundamental AI into practical tools for science, the EU can unlock breakthroughs in key strategic areas such as health, climate change, energy, and digitalization. AI-based models enable scientists to analyse large amounts of data with high speed and accuracy, allowing them to find hidden patterns and knowledge and helping researchers make discoveries. Moreover, AI acts as a catalyst for accelerating the transfer from laboratory discoveries to industrial and societal applications, thus facilitating the valorisation of research results and fostering technological innovation across Europe.

- This ambition is embedded in each of the proposed measures, ensuring that the benefits of AI for science are fully realised throughout the European research ecosystem in line with EU values and strategic priorities.

The G6 recognizes that genuine AI innovation requires societal trust. This depends on widespread digital literacy and robust data protection. It is only when citizens understand AI and are assured that their data rights will be protected that they will be supportive of innovation in AI. This underscores that European AI development demands more than technical expertise. By embedding social sciences at the core of AI development, we can create technologies that are not just technically sophisticated, but culturally intelligent and socially responsive. By prioritizing trust and human context, the EU defines a new paradigm of excellence in AI development.

Through this strategy, the EU will enhance its global competitiveness in AI research, fostering innovation and solidifying its position as a leader in both foundational and applied AI research, while ensuring sustainable, ethical, and impactful AI development.

EXISTING CAPACITIES WITHIN THE G6

The following examples illustrate the distinctive expertise and capabilities of the six participating organisations. When leveraged collectively, these assets have the potential to deliver significant benefits for the EU as a whole.

[ELLIS](#) is a pan-European network of the leading AI sites across the continent. ELLIS aims to strengthen EU's sovereignty in modern AI research by establishing a multi-centric AI research laboratory consisting of units and institutes across EU. It was established by G6 scientists, and it has quickly grown into a network comprising [41 Units and two Institutes](#), [16 research programmes](#), and a [pan-European PhD programme](#) attracting talent from all over the world, with a [stream of cross-cutting events](#) across the continent. ELLIS includes core sites of CNRS ([Paris Unit](#)), CSIC ([Barcelona Unit](#)), Helmholtz (Munich & [Saarbrücken Units](#)), Max Planck (Jena, Saarbrücken and [Stuttgart Units](#), [Tübingen Institute](#)), and CNR ([Modena Unit](#)). Since its inception, it has led a sequence of successful EU networks of excellence in AI (ELISE, ELIAS, ELSA, ELLIOT, openEuroLLM).

The Max Planck Society and the Helmholtz Association are featured among the [“Top rising institutions in AI”](#) in Nature's 2024 list. In 2011, the Max Planck Society founded the Max-Planck Institute for Intelligent Systems, now one of the largest institutes of the Society and an international hotspot for modern AI research. Already in 2002, Max-Planck scientists co-founded the series of Machine Learning Summer Schools (www.mlss.cc), which have since been organised more than 40 times on six continents. AI core methodology is developed across all of our computer science institutes in Bochum, Kaiserslautern, Saarbrücken, Stuttgart and Tübingen. Work on applications of AI across the sciences pervades the Max Planck Society, and a dedicated AI PhD programme is under development.

The Helmholtz Association has set up its Information and Data Science framework (HIDS) since 2016 and, e.g., invested significantly in its AI and data science ecosystem with its [“Helmholtz AI Platform”](#). This deep structural capacity building fostered collaborations and underlies concerted efforts such as the [Foundation Model Initiative](#) (HFMI). The Helmholtz Association operates one of the [largest GPU clusters in Europe](#), which is in the process of being extended to the [first exascale machine](#), and it played a major role in setting up the [LAION](#) initiative for developing open source datasets and models.

AIHUB-CSIC, established by the CSIC, integrates 76 research groups from 35 centers across 17 scientific disciplines. Its interdisciplinary approach has enabled projects such as [AI4HealthyAging](#), which develops tools for early intervention in neurological and degenerative diseases affecting aging populations. The CSIC also emphasizes ethical principles through initiatives like [HumanE-AI Network](#), which focuses on consensus-building systems that respect diverse perspectives.

Similarly, the CNRS has established itself as a leader in EU's AI landscape through initiatives like [AISSAI \(AI for Science, Science for AI\)](#), which fosters interdisciplinary collaboration between AI experts and scientists from fields such as biology and climate modeling. The CNRS also hosts EU's leading [AI-dedicated supercomputer Jean Zay](#), supporting over 1,400 projects annually with applications ranging from cancer research to climate simulations. Its [nine national AI clusters](#) further integrate research with training and industry collaboration while addressing critical challenges such as sustainability and data privacy.

The CNR plays a pivotal role in aligning Italy's AI research and applications, particularly in science and technology, with broader EU priorities. The CNR leads the [FAIR \(Future AI Research\)](#) initiative, the largest national AI programme that brings together more than 20 universities, research institutions, and private companies to develop human-centered, trustworthy, and sustainable AI systems. In addition, the CNR coordinates the National PhD Programme in AI, a federated programme involving 61 universities and research centers. The availability of the [Leonardo supercomputer](#) - one of the world's most powerful supercomputer - represents a major asset for advancing AI research and innovation.

The Leibniz Association accords high priority to application-oriented research into and the use of AI. The [Leibniz Research Alliance 'Health Technologies'](#) integrates AI potential into medical imaging and interpretation, while the [Leibniz Research Network 'Mathematical Modelling and Simulation'](#) has been running AI schools for several years to promote AI skills. The institutes are strategically positioning themselves in this field, e.g. in the areas of AI knowledge graphs and data science infrastructures, digital materials research and AI hardware research. The decentralised structure of the Leibniz Association enables the institutes to apply AI in a targeted manner to the respective research questions. In addition, the Leibniz Association is involved in cross-institutional exchange on the use of AI in research in accordance with good scientific practice.

The G6 network unites six large multidisciplinary Research Performing Organisations located in Europe, the Consiglio Nazionale delle Ricerche (CNR), the Centre National de la Recherche Scientifique (CNRS), the Consejo Superior de Investigaciones Científicas (CSIC), the Helmholtz-Gemeinschaft Deutscher Forschungszentren (Helmholtz Association), the Leibniz-Gemeinschaft (Leibniz Association) and the Max-Planck-Gesellschaft (MPG).

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