Expanding the Frontiers of AI

NSF AI Investments at a Glance:

- Approximately **$750M** in AI investments annually
- NSF AI investments in **every U.S. state and territory**
- **27** NSF-led National AI Research Institutes
- **7** of 10 inaugural NSF Regional Innovation Engines involve significant AI focus
- **389** active SBIR/STTR awards support AI applications, totaling **$197.1M**

NSF 75 YEARS OF DISCOVERY & INNOVATION

2025 marks the 75th anniversary of NSF. Throughout the year, the agency will host in-person and virtual activities to commemorate this significant milestone.
For more information, visit: new.nsf.gov/75years

Driving AI Innovation

The U.S. National Science Foundation is one of the largest non-defense federal funders of artificial intelligence (AI) research. Our investments in foundational AI research stretch back to the early 1960's, setting the stage for today's understanding and use of AI technologies.

Today, NSF *drives cutting-edge multidisciplinary research in AI,* including machine learning and deep learning, natural language technologies, human-AI interfaces, robotics and advanced cyberinfrastructure for AI. In addition, NSF supports fairness, ethics, accountability, transparency, reliability, safety and security across all areas of AI, working to advance our ability to protect privacy, civil rights, and civil liberties.

The agency also *champions translational research that links AI innovation with science and the economy,* including agriculture, manufacturing, biotechnology and health. For example, NSF-funded projects are using the power of AI to design new catalysts that turn raw materials into products and improve water hazard responses and planning. In the health sector, researchers are developing AI tools to improve fertility potential, monitor patients with lung disease and alert medical staff to patients at risk for sepsis, to name a few.

The NSF AI Institutes program is the nation's largest AI research ecosystem. Launched in 2020, the AI Institutes represent a $500 million investment connecting over 500 funded and collaborative institutions across the U.S. for example:

- AgAID, led by Washington State University, integrates AI methods and robotics into agriculture and helps train the next-generation agricultural workforce.
- AI4ExceptionalEd, led by the University of Buffalo, provides speech language pathologists with the tools and insights to ensure no child in need of speech and language services is left behind.
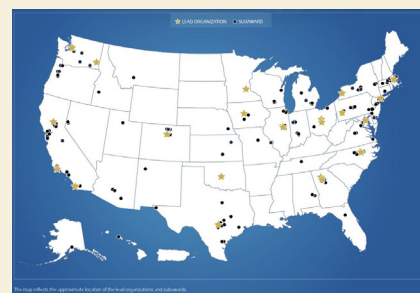
The NSF Regional Innovation Engines program creates and catalyzes innovation ecosystems across the US. The inaugural NSF Engines portfolio, which includes $150 million in investments, includes ten regional ecosystems, and seven involve a significant focus on AI technologies.

- *Development Awards* - Funded over 50 $1 million planning grants to support teams in the early stages of ecosystem formation.
- *Letters of Intent* - Nearly 300 communities across the country signaled an intent to apply to the new Engines opportunity.
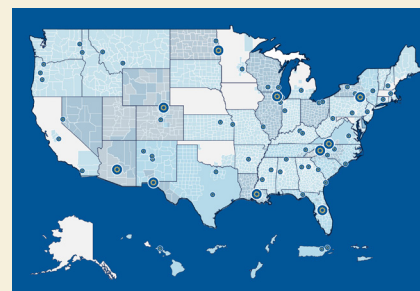
Fostering an AI-Ready Workforce

NSF-funded programs are preparing the current and next generations of AI-capable innovators and workers by investing in them at every stage. For example:

- At the preK-12 stage, programs such as NSF Discovery PreK-12 and NSF Computer Science for All get students interested in AI, computer science, and careers in STEM by providing them with hands-on learning experiences.

- The NSF Advanced Technical Education program supports the education of skilled technical workers at 2-year institutions. Meanwhile the NSF Expanding AI Innovation through Capacity Building and Partnerships program builds AI research and training capacity at minority-serving institutions and creates partnerships between those institutions and NSF AI Institutes.

- The NSF Experiential Learning for Emerging and Novel Technologies program provides participants, no matter their backgrounds in STEM, with the training and knowledge needed to succeed in STEM careers.

NSF is focused on developing solutions to enhance current job positions and create new job opportunities while also mitigating the impact of automation on the existing workforce. Relevant projects include giving firefighters new ways to communicate and make decisions during crises, safely pairing people with robots on construction sites and providing new approaches to improve trauma care.

Democratizing AI Research Resources

NSF enables access to resources such as computational infrastructure, data, software, testbeds, and training that engage the full breadth of the nation's talent in AI innovation.

NSF Leads the National AI Research Resource

The NAIRR is an NSF-led vision for a shared national research infrastructure for responsible discovery and innovation in AI. The NAIRR pilot takes the first step toward realizing this transformative vision. Launched in January 2024, the pilot brought together a coalition of 13 federal agencies and 26 nongovernmental partners, including Amazon, Microsoft, and the Allen Institute for AI, to make a wide range of computational, data, model, software and training resources available and accessible to the U.S. research community. Pilot projects are developing frameworks for producing protein sequences on-demand for specific applications, autonomous unmanned aerial systems to gather information on wildfires, audio-visual deepfake detection techniques, and much more.
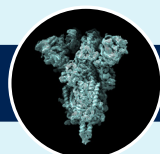
When realized in its full form, the NAIRR will provide a pathway to a future where AI research is not a privilege for the few — those who can afford the high cost of computational resources — but accessible to all who seek to contribute to the research enterprise.

For decades, the U.S. National Science Foundation's investments in artificial intelligence have led to discoveries and innovations that are making tangible and lasting impacts on the lives of millions of people. Such impacts are below. For more information on NSF's history of investments in AI, please check out our fact sheet.

CURRENT IMPACTS

SPEECH-BASED INTERFACES | PROTEIN STRUCTURE PREDICTION | CHATBOTS | LANGUAGE-LEARNING APPLICATIONS | AI AND SOCIETY

To learn more about NSF's AI initiatives, please visit new.nsf.gov/focus-areas/artificial-intelligence.