LEWIS–BURKE ASSOCIATES LLC

Overview of Federal Artificial Intelligence Research and Policy Priorities

Lewis-Burke Associates LLC – March 5, 2025

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Federal Outlook

Congress

Artificial intelligence and machine learning (AI/ML) will be a top policy priority for the 119th Congress. While Congress is currently focused on pressing funding urgencies like finalizing FY 2025 appropriations and passing a reconciliation bill, Lewis-Burke has heard from Congressional staff that a legislative package related to AI is expected to be introduced in this Congress. In addition several bills that would authorize and protect key AI initiatives are likely to reintroduced in this Congress. This could include the *CREATE AI Act*, which would formally authorize and provide support for the National AI Research Resource (NAIRR), and the *Future of AI Innovation Act*, which would ensure support for the US AI. Safety Institute. Reauthorization of the National AI Initiative Act will also be taken up by the House and Senate Science committees, which guides funding levels and policies for programs related to core and fundamental AI R&D. Finally, since both the Senate AI working group and House AI task force released their reports last year, they will likely focus on implementing priorities laid out in through new policy initiatives and priorities. Several policy makers who have historically focused on AI policy sit in key leadership positions on science committees. For example, Rep. Jay Obernolte (D-CA) who will lead the subcommittee on research and technology of the House Science, Space, and Technology Committee, and co-chair the House AI Caucus. On the Senate side, Senator Maria Cantwell (D-WA) will serve as Ranking Member on the Senate Commerce, Science, and Transportation Committee. Sen. Cantwell is a long time supporter of STEM and AI education, and co-introduced the *Future of AI Innovation Act* and *NSF AI Education Act*.

Trump Administration

Aligned with bolstering innovation in AI President Trump signed an Executive Order (EO) on *Removing Barriers to American AI Innovation*, on January 23. The EO comes after the President Trump rescinded the previous Administration's EO on AI, which focused heavily on AI safety,

security, and trustworthiness. The Trump Administration's EO calls for agencies to revise or withdraw all "policies, directives, regulations, or orders, or other actions" aligned with the Biden AI EO, calling for agencies to focus on rapid AI innovation, economic competitiveness, and national security in AI. In regard to AI development, the Order expresses that AI systems must be developed without bias or "engineered social agendas". Finally, the Order directs the newly named White House crypto and AI Czar to work with the National Security Advisor and Presidential Assistant for Science and Technology on a new AI Action Plan, as well as directing the White House to "revise and reissue" AI guidance through the Office of Management and Budget (OMB). The full EO can be found here and the Fact Sheet can be found here

The Trump Administration has already begun providing opportunities for non-federal entities to engage with the Administration on AI. In mid-February the Office of Science and Technology Policy (OSTP) and the Networking and Information Technology Research and Development (NITRD) National Coordination Office (NCO) has released a Request for Information (RFI) on the Development of an Artificial Intelligence Action Plan. The creation of this plan was directed by the Executive Order (EO) administered by the Trump Administration on Removing Barriers to American AI Innovation. Responses to this RFI will inform a national AI plan to spur AI innovation, ensure global dominance in AI, and fortify national security Responses to the RFI are due by **March 15**, and topics may address any relevant AI policy issue, which include: "hardware and chips, data centers, cybersecurity, data privacy and security throughout the lifecycle of AI system development and deployment, technical and safety standards, risks, regulation, and governance," among many other topics.

Below is more detailed information on AI/ML p priorities and major funding opportunities across relevant federal agencies.

Federal Agencies Investment in AI/ML

National Science Foundation (NSF)

The FY 2024 omnibus bill did not provide a specific funding level for AI, but encouraged continued efforts to support AI related research initiatives as well as focus on the transparency, interpretability, and explainability of AI. The FY 2025 budget request for NSF includes $729.16 million for AI funding, which would be a 10 percent increase over the FY 2023 base level. The requested funding would support current and planned AI institutes along with recently launched and long-standing AI programs in research and education. More information on specific opportunities is provided below.

NSF AI Research Institutes
NSF's flagship activity in AI is the NSF AI Research Institutes. Winners of the first three rounds of AI Institutes were announced in August 2020, July 2021, and May 2023, with more institutes currently under competition in astronomical sciences, materials research, and strengthening generative AI. The next competition is expected in the summer of 2025 as NSF shifted to an every other year program cadence. More information regarding the current AI Institute competition can be found here.

National Artificial Intelligence Research Resource Pilot (NAIRR)

The NAIRR Pilot program was launched in January 2024 and supports “fundamental, translational and use-inspired AI-related research with particular emphasis on societal challenges”. The program connects U.S. researchers and educators to computational, data, and training resources needed to advance AI research, partnering with government-supported and non-governmental partners to create a shared national research infrastructure. More information on the NAIRR pilot can be found here.

Artificial Intelligence (AI)-Ready Test Beds

In July 2024, NSF released a Dear Colleague Letter (DCL) to encourage planning grants that expand existing test beds and infrastructure to make them AI-ready and appropriate for use in evaluating the impact and effect of AI tools and systems on users. Planning grants would support the development of AI-Ready Test Beds that "can be used by researchers to test novel AI methods in potential real-world application scenarios." More information on AI-Ready Test Beds can be found here.

Programs

Mathematical Foundations of Artificial Intelligence (MFAI), launched in May 2024

- The MFAI program supports “research collaborations between mathematicians, statisticians, computer scientists, engineers and social behavior scientists to establish innovative and principled design and analysis approaches for AI technology”.
- Deadline of October 10, 2025
- More information on MFAI is available here.

Mathematical Foundations of Digital Twins (MATH-DT), launched in March 2024

- The MATH-DT program supports “foundational mathematical and statistical research on digital twins in applied science to harness science, technology and innovation to address society’s most pressing challenges”. The program encourages collaborative efforts in fundamental research innovation in Digital Twin development.
- Deadline of March 17, 2025
- More information on MATH-DT can be found here.

Foundations for Digital Twins as Catalyzers of Biomedical Technological Innovation (FDT-BioTech), launched in March 2024

- The FDT-BioTech program supports “interdisciplinary research projects that explore the mathematical and engineering foundations behind the development and use of digital twins in biomedical and healthcare applications”. The program has a specific interest in silico models used in the evaluation of medical devices and the relevance of the developed models in addressing challenges affecting the development and assessment of biomedical technologies
- Deadline of May 5, 2025
- More information on FDT-BioTech can be found here.

Accelerating Computing-Enabled Scientific Discovery (ACED), launched in February 2024

- The ACED program seeks to drive new computing advancements while accelerating scientific discovery by promoting partnerships between computer science researchers and those with expertise related to the Biological Sciences, Mathematical and Physical Sciences, and Engineering.

- The program solicitation notes interest in questions related to how novel artificial intelligence techniques can accelerate scientific discovery as well as how new innovations in digital twins can exceed traditional modeling techniques.
- Deadline of September 17, 2025.
- More information on ACED can be found here.

Other Ongoing Cross-Cutting Funding Opportunities
NSF has invested in AI through multiple funding opportunities including fundamental research across NSF. Examples of NSF programs that support AI research are described below.

Expanding AI Innovation through Capacity Building and Partnerships (ExpandAI)
- Aims to build capacity and broaden participation in AI research, education, and workforce development at Minority-Serving Institutions (MSIs). ExpandAI will support Capacity Building Pilots (CAP) awards, and partnership awards within the NSF AI Institute ecosystem (ExpandAI Partnership (PARTNER) awards). This solicitation includes DHS, USDA, NIST, and DOD.
- Deadline of March 10, 2025.
- More information on ExpandAI can be found here.

NSF Research Traineeship (NRT Program)
- The NRT program supports "interdisciplinary, evidence-based traineeships that advance ways for graduate students in research-based master's and doctoral degree programs to pursue a range of STEM careers." The current competition notes interests in proposals related to NSF priority areas, which would include AI, although there is no longer an AI-focused track.
- More information on NRT is available here.

Experiential Learning for Emerging and Novel Technologies (ExLENT)
- The ExLENT program supports provision of experiential learning experiences that promote access to and pathways into emerging technology fields, including AI. Funding supports program implementation, stipends or other supports for student participants, and other needs to address participation barriers for diverse cohorts.
- More information on ExLENT can be found here.

Cyber-Physical Systems (CPS)
- The CPS program supports "research on engineered systems with a seamless integration of cyber and physical components, such as computation, control, networking, learning, autonomy, security, privacy and verification, for a range of application domains."
- Deadlines in Summer 2025.
- More information on CPS is available here.

Research on Innovative Technologies for Enhanced Learning (RITEL)
- The RITEL program supports "early-stage research in emerging technologies such as AI, robotics and immersive or augmenting technologies for reaching and learning that respond to pressing needs in real-world educational environments". RITEL supports research in all learning contexts and for all learner populations.
- Deadline of November 4, 2025.

- More information on the RITEL program can be found here.

Core Programs with AI-Focused Themes
Science of Learning and Augmented Intelligence (SL)

- This core program from the Division of Behavioral and Cognitive Sciences (BCS) is interested in developing basic theoretical insights and fundamental knowledge about augmented intelligence (how human cognitive function can be augmented through interactions with others or with technology).
- The program supports research "on augmented intelligence that clearly articulates principled ways in which human approaches to learning and related processes, such as in design, complex decision-making and problem-solving, can be improved through interactions with others or through the use of artificial intelligence in technology".
- Deadline of August 6, 2025.
- More information on SL can be found here.

IIS: Robust Intelligence (RI)

- The RI program, which is a core program of the Computer and Information Science and Engineering (CISE) Directorate, supports "computational research in artificial intelligence, machine learning, computer vision, human language technologies and computational neuroscience". RI includes a specific program area for AI.
- More information on RI can be found here.

Human-Centered Computing (HCC)

- The HCC program, also a core program of CISE, supports "research in human-computer interaction (HCI)" that integrates knowledge across disciplines to design new computing systems that amplify humans' physical, cognitive, and social capabilities to accomplish individual and collective goals. The program's human-technology interface explores methods for interaction with artificial intelligence.
- More information on HCC is available here.

CNS: Networking Technology and Systems (NeTS)

- The NeTS program, also a core program of CISE, supports research regarding the "fundamental scientific understanding of and advances in large-scale, complex, heterogeneous communication networks". The program is also interested in theoretical and artificial intelligence-based approaches for design and analysis of wireless communications networks, including establishment of performance limits and characterization of achievable trade-offs.
- More information on the NeTS program can be found here.

CCF: Software and Hardware Foundations (SHF)

- The SHF program, also a core program of CISE, supports "research on the design, evaluation and operation of computer hardware and software". The program also is looking to support the development of new formal techniques for emerging areas such as artificial intelligence, autonomous systems, and policy and regulatory compliance.
- More information on the SHF program can be found here.

Department of Energy (DOE)

AI/ML continues to be one of DOE's top cross-cutting emerging technology research and development. Planned investments and competitive solicitations in AI/DS open to national labs and research universities in FY 2025 include:

Office of Science

- Scientific AI foundation models to accelerate innovation for forefront science and for models trained on unique, highly curated scientific datasets, including models that can only be trained on supercomputers.
- AI tools for design and evaluation of trustworthy AI systems, including new storage and archival tools for FAIR (Findable, Accessible, Interoperable, and Reusable) data and privacy-preserving algorithms to enable science using proprietary and sensitive data.

NNSA

- New AI tools and methodologies to assist in reducing cost and schedule in the discovery, design optimization, manufacturing and certification, and deployment and surveillance phases of a nuclear warhead system;
- Continue to develop AI/ML applications for additive manufacturing, advanced engineering materials work, and record digitization efforts.

Looking ahead to FY 2026, DOE is considering the creation of AI Research and Development Centers. In July 2024, the Senate introduced the Department of Energy (DOE) Artificial Intelligence Act which would authorize $1.2 billion to create at least eight National Lab-led AI Research and Development Centers. Key elements would include:

- National lab-led multidisciplinary centers with research university and industry partners;
- No less than $30 million per year for each center with an initial award period of no less than five years and up to seven years, with another five-year renewal;
- Advance three main objectives—accelerate the safe and trustworthy deployment of AI for science, energy, and national security missions; demonstrate the use of AI in addressing those DOE mission areas; and maintain a U.S. competitive advantage; and
- Each center should have a distinct AI research and innovation goal to advance specific science, energy, and national security missions and develop a technical roadmap to meet those goals within five to seven years (the first award term for the center).

Department of Defense (DOD)

Defense Advanced Research Projects Agency (DARPA)

DARPA has funded research in AI for decades and is responsible for early advances in AI/ML technology. DARPA's Information Innovation Office (I2O) maintains a focus on AI and considers "proficient artificial intelligence" one of its core research thrusts. I2O aims to (1) "advance the state of the art of AI," (2) "apply state-of-the-art AI to create new capabilities for national security," and (3) "develop techniques to mitigate the threats posed by state-of-the-art AI systems." I2O has multiple open BAAs which are specifically focused on AI research. While many of the existing BAAs have expiration dates in Fall 2024, new AI-focused BAAs are expected to be released or renewed after these fall expiration dates.

The Military Services
The Military Services have continued investing in AI, establishing new R&D programs and centers to align with DOD priorities. Each military service generally develops capabilities for its own warfighters. Some programs relevant to Service-specific AI development are outlined below.

Army
The Army's Combat Capabilities Development Command (DEVCOM) is the umbrella entity overseeing the Army Research Lab (ARL) and Army Research Office (ARO). ARL supports various essential research programs (ERP), including Artificial Intelligence of Maneuver and Mobility (AIMM ERP). AIMM seeks to advance AI research for Next Generation Combat Vehicles (NGCV) in collaboration with other government entities and academic partners.

ARL has released various Broad Agency Announcements (BAA) and other funding opportunities in the past year focused on AI. In November 2022, ARL released a BAA that will be open until November of 2027 that includes several topics related to AI, including "Artificial Intelligence and Machine Learning with Extremely Sparse Data,and Artificial Intelligence and Machine Learning Managing Massive Data Sets," among other topics. AI is expected to continue to be a major focus in upcoming funding opportunities from ARL. In April 2024, the U.S. Army Futures Command's (AFC) Army Applications Laboratory (AAL) issued a BAA for Disruptive Applications, aiming to fund researchers focused on pioneering advancements in disruptive technologies within accelerated timeframes. The BAA outlines three key lines of effort: the discovery, acceleration, and translation of disruptive technology applications, with a particular interest in AI-related research, including large-scale data analysis.

In 2019, the U.S. Army developed the Artificial Intelligence Integration Center (AI2C), formerly the AI Task Force, in partnership with and based out of Carnegie Mellon University. The center's mission is to connect the Army with the broader AI community and to better identify new and emerging technologies to solve challenges in the field. AI2C is currently accepting partnership inquiries, from organizations including but not limited to academic, foreign organizations, and nonprofits, however they are not able to offer new T2 partnerships at this time. AI2C released a BAA on the topic of Transformative Artificial Intelligence Research and Applications. This BAA is accepting applications until August 2026 and is looking for research that aims to bolster new technology in basic, applied, and advanced research (6.1, 6.2, 6.3, and higher). Data visualization and synthetic environments was named an area of interest among other topics. More details on the BAA can be found here.

Navy
In April 2024, the Navy released its 2024 Naval Science and Technology Strategy to highlight their updated S&T focus areas, which include Autonomy/AI, acknowledging the importance of basic research in AI and the potential applications to Naval S&T challenges.

The Navy funds a portfolio of S&T research primarily through the Office of Naval Research (ONR) and Naval Research Laboratory (NRL). The Navy Center for Applied Research in Artificial Intelligence (NCARAI) within NRL conducts basic and applied research on AI to address problems that are critical to the Navy, Marine Corps, and broader DOD community. NCARAI offers Educational Partnership Agreements (EPAs) that allow universities and non-profits who are committed to advancing science education to engage in NRL research or technology transfer/transition projects. ONR's Division 311: Mathematics, Computer, and Information

Sciences (MCIS), houses the core computing and AI initiatives for ONR. Division 311 supports Mathematical Data Science and basic research on machine learning.

Air Force

The Air Force Office of Scientific Research (AFOSR) executes AFRL's basic research program and has multiple research areas of focus. One research focus is Information and Networks (RTA2). While RTA2 has various research interests which "lie at the intersection of the ability to collect, mathematically analyze, and disseminate large quantities of information in a time critical fashion with assurances of operation and security," the program has a significant focus on AI topics including, the utilization of AI for decision-making models, algorithms, and sensing/enhancing situational awareness.

National Institutes of Health (NIH)

NIH is interested in using AI/ML to increase the utility of the vast amount of data generated through biomedical research, including data contained in electronic health records, -omics and imaging data sets, and disease-specific databases. In January 2025, NIH launched a new Strategic Plan for Data Science 2025-2030. The strategic plan outlines five goals around data sharing and management, human-derived data for research, new opportunities in software and AI, biomedical research data infrastructure, and strengthening the data science community.

NIH's Office of Data Science Strategy (ODSS) coordinates NIH-wide activities related to AI/ML. At the June 2024 Advisory Committee to the Director (ACD) meeting, ODSS received approval to move forward with three new training programs aimed at preparing the next generation of biomedical researchers in the use of ethical AI. The programs will build on existing NIH-wide efforts like Bridge to Artificial Intelligence (Bridge2AI), but will focus on imparting skills identified as strategically important for the future biomedical workforce, such as ontology usage, data encoding, and AI-assisted reuse of existing datasets. Team-based science and the intersection of ethics with biomedical AI will also be emphasized across the three programs. ODSS plans to launch a postdoctoral program using the K01 mechanism and two R25 29 programs (one aimed at biomedical and behavioral undergraduate and graduate researchers, and one aimed at graduate bioethics and humanities researchers) in FY 2025 pending available funds.

ODSS also curates a list of funding opportunities across NIH ICs for work related to AI/ML in biomedical research, available here.

Advanced Research Projects Agency for Health (ARPA-H)

The Advanced Research Projects Agency for Health (ARPA-H) was launched in March 2022 with the goal of accelerating better health outcomes for all Americans and revolutionizing how we prevent, treat, and cure diseases. At its launch, ARPA-H debuted with an Open-Office Broad Agency Announcement (BAA), soliciting cutting-edge, transformative biomedical proposals. As ARPA-H has entered its third year, its overall mission has remained in funding high-risk, high-reward research that translates scientific discoveries and inventions into technological innovations, accelerating transformational technological advances in areas industry alone will not undertake.

Mission Office-specific Innovation Solutions Openings (ISO) programs housed in ARPA-H's four mission offices have now been launched in replacement of the Open BAA. The ARPA-H mission offices are:

- **Health Science Futures***:* Accelerating advances across research areas, removing limitations that stymie progress towards solutions;
- **Scalable Solutions***:* Addressing geography, distribution, manufacturing, data and information, and economies of scale challenges to create timely and equitable solutions;
- **Proactive Health***:* Focus on prevention by creating new capabilities to detect and characterize disease risk and promote treatments and behaviors to anticipate health threats (e.g., viral, bacterial, chemical, physical, psychological); and
- **Resilient Systems***:* Capabilities, business models, and integrations to respond to crises (e.g., pandemics, social disruption, climate change, economic instability).

One interest area specific to the Resilient Systems mission office is "novel ways to protect, secure, integrate, analyze, communicate, and present health data, including but not limited to advances in privacy, cyber security, artificial intelligence with enhanced patient safety properties, low-code or no-code technologies, semantic approaches, and rapid integration techniques."

Through the Open BAA, ARPA-H has funded projects that aim to incorporate AI/ML technology into biomedical research. A full list of projects funded through the Open BAA is available here.

Moving forward, ARPA-H is beginning to launch programs at a more rapid pace in conjunction with the announcement of new program officers. Programs launched thus far with relevance to AI/ML include:

- **ARPA-H Biomedical Data Fabric (BDF) Toolbox**: Aims to increase access and decrease barriers to connect biomedical research data from multiple sources through the use of AI/ML generated data sets.
- **ARPA-H Digital Health Security Initiative (DIGIHEALS):** Aims to incorporate the current developments of the cybersecurity industry into the healthcare field to protect healthcare data at hospitals and medical centers through AI/ML. A list of awards made through DIGIHEALS is available here.
- **Universal Patching and Remediation for Autonomous Defense (UPGRADE):** Aims to bridge the gap between detecting digital vulnerabilities and preventing security large-scale cyberattacks on medical technology systems through the development of protective AI software.