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Request for Information: Development of a 2025 National Artificial Intelligence Research and Development Strategic Plan

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General Comment

See attached file(s)

Attachments

Open Valley-RFI-2025

RFI Response

**NATIONAL SCIENCE FOUNDATION AND THE OFFICE OF SCIENCE
AND TECHNOLOGY POLICY
Washington, DC**

In the Matter of

**Request for Information on the Development of a 2025 National
Artificial Intelligence (AI) Research and Development (R&D) Strategic Plan**

Docket No. NSF–2025–OGC–0001

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To: Faisal D'Souza, NCO
Office of Science and Technology Policy
2415 Eisenhower Avenue
Alexandria, VA 22314

May 28, 2025
Open Valley

From: Ahmed Rady

Re: Request for Information on the Development of a 2025 National Artificial Intelligence (AI) Research and Development (R&D) Strategic Plan

Open Valley Response to the US AI Action Plan RFI Update

Open Valley appreciates the opportunity to contribute to the United States AI Action Plan. We look forward to helping the administration strengthen America's global leadership in AI, drive government efficiency, create jobs, and boost the U.S. economy. Aligned with the bold vision for American AI leadership, based on innovation and entrepreneurship, that will "promote human flourishing, economic competitiveness, and national/global security."

As the technology pioneers leading end-to-end open networks architecture, advanced connectivity, and AI/ML SaaS providers, we believe that the open-source AI approach is the foundation that leads to better products, faster innovation, larger economic growth, and increased productivity. Open Valley has been at the forefront of the open-source since the establishment in 2022 and actively participating in open-source communities such as The Linux Foundation, ONF "Open Networking Foundation," and Magma, as well as open networks standard bodies such as O-RAN Alliance, ATIS, 3GPP, Bharat 6G Alliance, and Connectivity Standard Alliance.

Our response to this RFI Considering the previous administration's National Artificial Intelligence Research and Development Strategic Plan (2023 Update) and our views of the potential updates that may be needed to rewrite the national AI strategic plan with a focus on the critical areas that may require long-term investment with uncertain commercial payoffs as well as areas of foundational research. Also, it is very important to shed some light on the criticality of prioritizing investment in an advanced domestic connectivity ecosystem, e.g., 6G, 5G, and Open RAN, to enhance accessibility and operational speed.

The previous administration's National Artificial Intelligence Research and Development Strategic Plan (2023 Update) primarily focused on R&D that promotes responsible innovation, including R&D to leverage AI to tackle large societal challenges and develop new approaches to mitigate AI risks reaffirms eight key strategies as follows. That defines the national AI R&D strategic plans and answering the key potential questions (**Policy & Governance, Technical Priorities, Ethics & Society, International Dimensions, Workforce & Inclusion, Implementation**).

- Strategy 1: Make long-term investments in fundamental and responsible AI research.
- Strategy 2: Develop effective methods for human-AI collaboration.
- Strategy 3: Understand and address the ethical, legal, and societal implications of AI.
- Strategy 4: Ensure the safety and security of AI systems.
- Strategy 5: Develop shared public datasets and environments for AI training and testing.
- Strategy 6: Measure and evaluate AI systems through standards and benchmarks.
- Strategy 7: Better understand the national AI R&D workforce needs.
- Strategy 8: Expand public-private partnerships to accelerate advances in AI.
- Strategy 9: Establish a principled and coordinated approach to international collaboration in AI research.

Considering the previous administration's National AI R&D Strategic Plan (2023 Update) and aligned with the Trump Administration's new AI Action Plan and guidelines that ensure the United States can secure its position as the world leader in artificial intelligence, the below are the main considerations for our response and as highlighted by the Docket No. NSF-2025-OGC-0001.

- Identifying specific AI research areas that the Federal government should prioritize.
- Focusing on areas where private sector investment is insufficient or where national interests require government leadership.
- Considering areas that may not offer immediate commercial returns but serve national interests.

The Federal government should prioritize and Invest:

- Infrastructure support for the AI research and development community.
- AI research for national security and critical infrastructure.
- Research on next-generation AI hardware and architectures beyond deep learning.
- AI research for accelerating fundamental scientific discovery and technological breakthroughs in areas with insufficient private-sector investment.
- Fundamental advances in AI algorithms, architectures, mathematical foundations, and computing paradigms aiming to maintain U.S. AI leadership.
- Advances in AI for the public sector and government applications.
- Advances in AI applications in cybersecurity and cyberspace operations beyond commercial use.
- Research on AI systems and education supporting American workers and improving workforce productivity.

(A) Infrastructure support for the AI research and development community.

I. Expand and Modernize AI Compute Infrastructure:

Build AI-ready supercomputing capacity: Establish or expand centralized compute resources enabling equitable access for academic and public-interest researchers who lack industrial-scale computing power

Deploy distributed infrastructure: Encourage AI compute at the edge and on-device to alleviate cloud-based bottlenecks and enhance security and efficiency

Support shared academic infrastructure: Provide grants or access to tiered computing for universities to support both cutting-edge research and educational training

II. Accelerate AI Data Center and Broadband Deployment:

Streamline permitting: Establish national-level fast-track approvals for building data centers, broadband fiber networks, and related power infrastructure

Create AI Economic Zones: Designate federal-state-private sector collaboration zones to speed infrastructure permitting and incentivize private capital investment

Use federal offtake agreements: Help guarantee demand for new data center infrastructure to attract financing

III. Ensure Energy Resilience:

Modernize the power grid: Upgrade national transmission systems to handle the energy demands of AI workloads, including grid-enhancing technologies and diversified energy sources.

Enable AI-smart grids: Deploy AI to optimize energy usage in data centers and national grid operations

IV. Strengthen Networking and Data Infrastructure:

Invest in digital connectivity: Ensure universal high-bandwidth internet access for AI deployments across regions

Digitize public data: Make federal datasets more accessible and machine-readable to help small innovators and researchers

Coordinate cloud strategies: Align government procurement and cloud platforms to enable efficient AI workloads and secure deployments

IV. Fund and Facilitate Academic and Industrial Partnerships:

Invest in university-based infrastructure: Direct funding to academic institutions for local AI computing resources and access to national platforms like Stargate.

Promote public-private research hubs: Co-locate infrastructure development with local expertise, e.g., AI for power systems in energy hubs.

(B) AI research for national security and critical infrastructure.

I. Strengthen Cybersecurity for Critical Infrastructure:

Deploy autonomous AI-based cyber defense: Use AI for real-time detection, adaptation, and response to cyber threats, especially against attacks on critical sectors like power grids and financial networks

Implement Zero Trust frameworks: Mandate advanced cybersecurity architectures tailored to AI environments

Align with risk-based cybersecurity standards: Encourage government adoption of existing standards to prevent duplication and ensure robust protection across sectors

II. Fund AI R&D Targeted at National Priorities:

Expand AI R&D funding for national missions: Use grants and dedicated funding to support mission-aligned innovation in cybersecurity, defense automation, and critical systems resilience

Incentivize dual-use innovation: Promote public-private research partnerships for AI technologies that benefit both civilian and national security objectives

III. Integrate AI into National Security Missions:

Adopt domestic AI models at scale: Use advanced American-developed AI models within defense and intelligence agencies for data analysis, threat detection, and operational efficiency. Current adoption levels are insufficient compared to other nations.

Secure classified AI environments: Invest in cloud infrastructure with the highest security classifications to enable mission-critical generative AI applications

(C) Research on next-generation AI hardware and architectures beyond deep learning.

Beyond traditional deep learning architectures, research needs to be actively exploring innovative hardware and architectural approaches to AI:

Quantum Computing: While still in early development, quantum computing has immense potential for AI, with quantum AI algorithms capable of solving problems intractable for classical computers.

Hybrid AI Architectures: Researchers are also investigating combinations of different computing paradigms, such as integrating classical processors with neuromorphic chips or quantum accelerators, to leverage the strengths of each approach for specific AI workloads.

Neuromorphic Computing: This field aims to mimic the structure and function of the human brain, offering greater energy efficiency and cognitive capabilities than current AI hardware

(D) AI research for accelerating fundamental scientific discovery and technological breakthroughs in areas with insufficient private-sector investment.

long-term, fundamental research in areas such as general-purpose AI systems, explainability, reasoning, robotics, and trustworthy AI — areas not immediately profitable for the private sector but essential to national interests. This includes advancing data-centric AI, federated learning, and AI for scientific simulations (e.g., for climate modeling, fusion energy, epidemiology). Also suggest focusing on AI for manufacturing, materials discovery, and scientific instrumentation, where government can drive innovation through sustained investment.

Expanding National AI Research Infrastructure as infrastructure investments should prioritize support for non-commercial, scientific AI use cases such as high-performance computing for genomics, astrophysics, and chemical simulations.

Fund cross-disciplinary centers at universities to develop AI for specific domains like materials, sustainability, public health, or climate — especially where the private sector has limited domain expertise. such centers for bridging computing with domain-specific fields.

(E) Fundamental advances in AI algorithms, architectures, mathematical foundations, and computing paradigms aiming to maintain U.S. AI leadership.

I. Fundamental Advances in AI Algorithms:

Multi-Modal Data Fusion: Developing algorithms that can fuse and represent multiple data types (e.g., text, image, audio, sensor data) to improve human synthesis, reasoning, and decision-making

Knowledge-Guided Machine Learning: Integrating traditional physics-based analysis and domain knowledge with machine learning to leverage the strengths of both approaches. This can lead to more accurate and reliable models, especially in scientific and engineering applications.

II. Advances in AI Architectures:

Graph-based, Topology-aware AI Models: Developing models capable of effectively analyzing spatial-temporal data on complex networks for tasks like anomaly detection.

Implicit Neural Network-based Solvers: Utilizing advanced deep learning architectures for previously unsolvable optimization problems, such as those in power grid management.

III. Advances in Mathematical Foundations:

Robust AI Models: Developing robust AI models that can effectively handle real-world shifts in data distribution, ensuring performance and reliability outside of controlled training environments. This implies a deeper mathematical understanding of generalization and out-of-distribution performance.

Behavioral System Theory with Machine Learning: Combining theoretical approaches from behavioral system theory with machine learning to develop efficient control algorithms without relying on explicit mathematical models of system dynamics.

IV. Advances in Computing Paradigms:

Neuromorphic and Quantum AI: the broader context of "next-generation AI hardware" implies exploration into these and other advanced computing technologies beyond traditional von Neumann architectures.

Energy-Efficient AI Hardware: Significant investment in low-carbon, energy-efficient AI hardware development. This includes "Chips-for-AI" programs to create specialized hardware optimized for AI, which will reduce energy consumption and carbon footprints.

(F) Advances in AI for the public sector and government applications.

I. Invest in Digital and Data Infrastructure for Public Use:

Digitize public records: Making government records machine-readable and accessible allows AI systems to improve service delivery and transparency

Modernize IT systems: Public-sector applications of AI require robust IT infrastructure, especially cloud platforms capable of supporting real-time data sharing and large-scale inference

II. Accelerate AI Adoption in Federal Agencies:

Streamline procurement and deployment: urge the government to simplify contracting and technology approval processes. And Simplified Acquisition Threshold can enable faster access to cutting-edge AI capabilities.

Deploy GenAI for mission outcomes: Agencies are encouraged to adopt domain-specific AI, including foundation models fine-tuned for tasks like customer service, records processing, fraud detection, and national security operations.

III. Support Public-Private Partnerships:

Co-create solutions with industry: Encourage federal agencies to co-develop AI pilots and proofs of concept with tech companies, especially for critical services like healthcare (e.g., VA, HHS), energy (DOE), and transportation (DOT)

Leverage university-government models: Research Institutions and Universities emphasize strengthening collaborations between academia and government to deploy AI in public health, urban planning, and environmental monitoring

IV. Establish National AI Mission for Government Efficiency:

Create a federal AI deployment roadmap: A national plan could set clear targets for where AI can most improve public services (e.g., disaster response, benefits delivery, infrastructure monitoring) and identify agency-specific champions for implementation

Support AI-ready workforce in government: Train federal employees to work with, evaluate, and manage AI systems through reskilling programs and strategic hires

(G) Advances in AI applications in cybersecurity and cyberspace operations beyond commercial use.

To support advances in AI applications in cybersecurity and cyberspace operations beyond commercial use, we recommend that the U.S. federal government take strategic actions across adoption, infrastructure, standards, and collaboration:

I. Build Infrastructure for Government-Grade AI:

Invest in classified, mission-specific AI infrastructure: Fund and deploy cloud and compute systems in classified domains to enable AI at the highest security tiers

Secure the full AI tech stack: Implement policies and standards covering infrastructure, models, and applications to prevent system-level cyber vulnerabilities

II. Expand R&D and Public-Private Risk Mitigation:

Collaborate with industry: Partner with AI developers to evaluate frontier models for dual-use risks, and advanced cyber threats

Fund open-source and academic contributions: Open-source AI models are already being used in cybersecurity contexts (e.g., threat modeling, vulnerability detection), and should be supported by federal initiatives

III. Coordinate with Industry and Allies:

Establish cross-sector AI security standards: Use existing frameworks of creating duplicative new ones. This maintains flexibility while ensuring rigorous protection

Engage in global cybersecurity diplomacy: coordinate with allies on shared norms for AI use in cyberspace

IV. Institutionalize National AI Cyber Strategy:

Create a unified federal AI cybersecurity task force: Coordinate protocols, trust frameworks, and threat response across all federal agencies, with clear oversight and alignment to national goals.

Embed secure development practices: Mandate secure coding standards, threat modeling, and developer training for all government-affiliated AI systems.

(H) Research on AI systems and education supporting American workers and improving workforce productivity.

Develop national training curricula and call for federally supported curricula in AI, robotics, and digital manufacturing — especially for displaced workers and workers in traditional industries like manufacturing, logistics, and infrastructure.

Invest in Tools that Enhance Workforce Productivity highlights the transformative potential of AI copilots for enhancing performance across sectors.

Conclusion: Artificial Intelligence (AI) is reshaping the global economy and redefining the boundaries of innovation. As leaders in the private sector actively building and deploying AI technologies, we believe the United States must embrace a forward-leaning, innovation-enabling national AI strategy to maintain global leadership, accelerate responsible deployment, and ensure widespread economic benefit.

Open Valley, as a private sector ecosystem member, is ready to work alongside the federal government to realize the full promise of AI. With a clear national strategy, supportive infrastructure, and a focus on collaboration, the U.S. can lead the next era of global innovation while protecting its workforce, values, and strategic interests.