

15 March 2025

*To: Networking and Information Technology Research and Development (NITRD) National Coordination Office (NCO), National Science Foundation*

*In re: Response to the Request for Information on the Development of an Artificial Intelligence (AI) Action Plan*

IEEE welcomes the opportunity to provide comments to the Networking and Information Technology Research and Development, National Coordination Office and the White House Office of Science and Technology Policy on the priorities that should be in the new *AI Action Plan*.

IEEE-USA represents approximately 150,000 engineers, scientists, and allied professionals living and working in the US. Our members are a diverse group of technical engineers, scientists and artificial intelligence (AI) governance specialists who develop and work with the emerging technologies used in artificial intelligence systems.

IEEE SA is a globally recognized standards-setting body that develops consensus standards through an open process that engages industry and brings together a broad stakeholder community to develop approaches and solutions for the pragmatic application of AI systems (AIS).

To prioritize national security and global dominance in the development and use of AI and AIS, the United States Government (USG) should commit to an approach which optimizes current resources, be they human or material, and ensures that future resources are developed for continued and guaranteed productivity and growth. AI and AIS are multifaceted systems developed by interdisciplinary teams across many cross-functional domains. As such, IEEE recommends that the USG:

- 1) Enable AI dominance through urgent development of a dedicated AI infrastructure, and use of standards which ensure AI and AIS interoperability, performance and reliability.*
- 2) Accelerate AI and AIS innovation through market-driven competition and innovation by democratizing technologies for national use and investing in emerging technologies and next-generation technological ventures.*
- 3) Ensure America's AI-enabled dominance for future generations by modernizing and creating a productive and efficient workforce.*

If you have any questions, or wish to discuss the input provided below, please do not hesitate to contact Erica Wissolik, [e.wissolik@ieee.org](mailto:e.wissolik@ieee.org) or (202) 360-5023.

*1) Enable AI dominance through urgent development of a dedicated AI infrastructure, and use of standards which ensure AI and AIS interoperability, performance and reliability.*

**Require existing expert bodies, such as OSTP, NITRD and other relevant entities, to conduct a thorough assessment of the nation's infrastructure backbone to find where novel infrastructure for AI and AIS must be developed or improved.** OSTP and NITRD should elicit recommendations and comments from public, private, and academic partners for developing novel AI-ready infrastructure, or improving existing infrastructure. The infrastructure improvements in question could be related to energy or operational efficiency, or secure networking and communication, but we recommend focusing primarily on emphasizing the need for a novel infrastructure for AI and AIS networking and communication.

**The complexities of a dedicated infrastructure for AI and AIS networking and communication can be managed through development of standards.** Standardization provides a common language for technological innovation and enables developing and implementing complex solutions at efficient cost structures. The USG should support standards development for interoperable, performant, and reliable AI and AIS.

IEEE recommends the following:

***1a) AI Infrastructure:*** The USG should develop an urgent plan for leveraging scalable and resilient networking and communication frameworks for AI and AIS. The goal should be development of autonomous AI and AIS communication networks along with development of tools with human-centric design for system controls and implementation of safety measures. Human-centric design ensures having interfaces and protocols which will make it easy for human controllers to monitor, adjust, and take over, if necessary, while maintaining oversight even as AI and AIS operate autonomously.

**Existing critical communication and networking infrastructure should be protected in conjunction with oversight from USCYBERCOM, and other relevant agencies.** The USG should seek to implement, via public and private partnerships, a strong digital identity for secure data transactions across existing communication networks. The goal should be to revitalize and safeguard infrastructure for national security.

***1b) Technical Standards:*** The USG should require relevant agencies to use clear, adaptable, and trustworthy standards for AI and AIS which ensure interoperability, performance, and reliability of AI and AIS networking and communication in an interconnected AI infrastructure. The adaptability of standards should not sacrifice reliability, performance or security. Interoperability can face challenges due to differing standards across systems. Thus, building a dedicated infrastructure for AI and AIS requires clear, adaptable and trustworthy standards to ensure performance and reliability of different technologies and components. The goal should be to ensure efficient, yet performant, AI and AIS so that interconnected systems can be scaled reliably and securely.

**IEEE recommends that the USG require the use of clear, adaptable and technically sound standards and frameworks that help ensure AI systems are effective, reliable and aligned with broader economic and national goals.** Technical standards provide the necessary technical foundation

to help support evidence-based policymaking, regulatory consistency and industry alignment. Standards:

- Establish common definitions, methodologies and benchmarks for AI systems, helping to ensure consistency across (sectoral, industry vertical) policy frameworks;
- Define parameters for risk assessments and classification frameworks, including providing testable criteria for AI performance, safety and accountability;
- Help enable global AI interoperability and scalability by contributing to the definition of benchmarks for AI performance, robustness and security; and
- Strengthen public-private AI collaboration as they facilitate dialogue between AI developers, regulators and policymakers—helping to ensure that AI policies are practical and technically feasible.

Technical standards help promote the innovative, trustworthy, and secure development and use of AI and AIS. The collaborative processes in which standards are developed support commercialization and diffusion of technologies by building consensus on information flows and enabling interoperability of components, manufacturing, and service requirements. Developed through public-private partnerships, they provide the foundation for trustworthy, scalable and effective AI systems that drive economic growth while supporting national security, technological advancement, and responsible implementation.

***1c) AI Procurement:*** IEEE recommends that the USG systematically identify areas where agencies implement and use AI and enable federal agencies to strengthen their requirements for AI procurement (defined as any process by which entities engage in determining which systems to purchase and use for their organizational and productivity needs). Public procurement systems are not necessarily ready for the challenges of procuring AI systems. The multilayered complexity of AI systems, and the data sets on which they are built, challenge the staff responsible for procurement, who may not understand the systems they are purchasing and deploying. Most federal agencies have not yet adapted their procurement processes and rules to address the emerging complexity.

**IEEE recommends the use of tools that offer complementary how-to-guidance that can be applied to a variety of processes, including pre-solicitation and contract monitoring.** As part of a broader risk management strategy – as recommended in the NIST AI Risk Management Framework (RMF) – standards such as IEEE [P3119](#) (Draft Standard for the Procurement of AI and Automated Decision Systems,) help strengthen AI procurement approaches with due diligence processes to help ensure that federal agencies are critically evaluating the kinds of AI services and tools they acquire. IEEE P3119 provides agencies with a method to require transparency from AI vendors about associated risk and can also help the USG to use their procuring power to shape the market. This could increase demand for trustworthy AI solutions.

*2) Accelerate AI and AIS innovation through market-driven competition and innovation by creating Centers of AI Acceleration and investing in emerging technologies and next-generation technological ventures.*

**The USG should incentivize both private and public sector investment for the creation of incubators and accelerators to create technological hubs in all parts of the country.** The benefits of

market-driven competition and innovation are obvious but require a carefully balanced and managed interplay between public, private, and academic entities for investing in promising technologies, and enabling the growth of market-ready ventures.

**The USG should continue to seek out and invest in high-risk, but high-reward, emerging technologies** which may not be economically feasible or practical for private companies or academia to pursue.

Lastly, the **USG should ensure that US regulatory and public policy frameworks do not hinder bringing technological innovation to the market.** IEEE recommends the following:

**2a) Centers of AI Acceleration: Incentivize the creation of novel technologies, which may open new markets.** [Centers of Excellence](#) are an existing model for the development of Centers of AI Acceleration; note that the model for Centers of AI Acceleration should not be only data centers. For technologies which promote national or homeland security, the USG should encourage the creation of private or academic incubators and accelerators partnered with federal agencies such as the Department of Defense or the Department of Homeland Security. However, there is also a need for Centers of AI Acceleration for the development of technologies and services which are not meant for defense or security. The goal of Centers of AI Acceleration should be to identify research and ideas which can address market needs in a targeted manner.

**2b) Future Investments: Empower DARPA, IARPA, and other federal funding agencies to pursue research and development in emerging technologies**, such as artificial general intelligence (AGI), quantum and neuromorphic computing, human-machine information synthesis, advanced robotics, or advanced stem cell therapy. DARPA should also create a program for R&D of autonomous systems which can withstand extreme environments for enabling deep space exploration via autonomous AI; the Arctic region, thermal vents, or the Moon, can serve as useful test beds for developing rugged, all-terrain AIS. Deep space exploration will open new economic opportunities for the U.S., e.g., via mining of minerals rare on Earth. However, an autonomous network of AI-managed satellites will add both security for American national interests, and extend AI and AIS networked communications to space.

*3) Ensure America's AI-enabled dominance for future generations by modernizing and creating a productive and efficient workforce.*

**The USG should seek guidance on developing a plan for human flourishing which includes development of skills necessary to use and deploy AI/AIS.** A recent Pew Study found that 52 percent of surveyed workers worry about AI use in the workplace [2]. The U.S. economy may suffer if Americans are wary of innovation or unaware of how to use AI. Prior transformational shifts in the economy, e.g., during the rise of Internet and digital technologies, demonstrated that new economies are created once an existing workforce gains an understanding and trust of new technologies. IEEE believes that governmental, private sector, and non-governmental institutions all play a crucial role in maximizing opportunities for students and workers in the emerging AI economy, and in mitigating the negative impacts on individuals. To support increased AI and AIS use in the workforce, IEEE recommends the following:

**3a) Productivity and Flourishing with AI and AIS:** The USG should develop a coalition of public, private, and academic partners and stakeholders to plan for upskilling workers in different domains; upskilling should include agentic AI. The American workforce may find it easier to manage and trust AI and AIS decisions if consequential decisions are made transparent via the use of Explainable AI (xAI) models and frameworks. To optimize physical or manual labor, a coalition of stakeholders should determine how to enable safe human-machine teaming AI-enabled tools, such as exoskeletons, or augmented vision (for example: firefighters using exoskeleton footwear to combat muscle fatigue).

**3b) Preparing for the Future:** The USG should task a coalition of stakeholders to identify foundation skills related to working and living with AI and AIS. Ensuring homeland and national security in the age of AI and AIS use requires building foundational skills for identifying both normal and abnormal AI and AIS behaviors. Some examples of foundation skills related to working and living with AI and AIS include managing risky AI behaviors (e.g., when chatbots give bad [advice](#)), managing AI overreliance and under reliance, identifying automation abnormalities, and understanding how to be safe when using such systems. The goal should be to enable effective and safe AI literacy, along with targeted upskilling for using, managing, and understanding such systems.

**Secondly, domain-specific opportunities and risks for human-AI partnership should be identified.** Americans will attain greater productivity by knowing how to navigate their existing work requirements with the help of AI and AIS, and how to safely partner with AI and AIS for future work requirements and environments. Some examples of domain-specific human-AI partnerships include data center automation and management, scientific research and development, managing and controlling transportation, and managing and controlling energy efficiency and resources.

In summary, IEEE recommends:

- 1) *Enabling AI dominance through urgent development of a dedicated AI infrastructure, and use of standards which ensure AI and AIS interoperability, performance and reliability, where:*
  - a dedicated infrastructure enables AI and AIS networking and communication;
  - standards ensure AI and AIS interoperability, performance and reliability;
  - AI procurement procedures safeguard both economic and national security; and
  - required technical and frameworks are clear, adaptable, and trustworthy.
- 2) *Accelerating AI and AIS innovation through market-driven competition and innovation by democratizing technologies for national use and investing in emerging technologies and next-generation technological ventures where:*
  - the creation of Centers of AI Acceleration promotes AI and AIS innovation and creates new economies for future growth and productivity, and
  - the US pioneers innovation and technology in emerging fields by enabling high risk, but high reward, endeavors.
- 3) *Ensuring America's AI-enabled dominance for future generations by modernizing and creating a productive and efficient workforce where:*

- *a coalition of public, private and academic partners and stakeholders plan for upskilling America's workforce via AI and AIS, and*
- *we identify the foundational skills all Americans need to be productive in a world with all types of AI and AIS.*