23 January 2024

To: National Institute of Standards and Technology (NIST)

Re: NIST's Assignments Under Sections 4.1, 4.5 and 11 of the Executive Order Concerning Artificial Intelligence (Sections 4.1, 4.5, and 11)

The IEEE Standards Association (IEEE SA) welcomes the opportunity to provide its comments on NISTs role in carrying out its responsibilities under the [President's Executive Order (EO) on Safe, Secure, and Trustworthy Artificial Intelligence](#), Sections 4.1, 4.5, and 11.

IEEE SA is a globally recognized standards-setting body within IEEE, the largest organization of technology professionals in the world. We develop consensus standards through an open, multistakeholder process that engages industry and brings together a broad stakeholder community.

These standards play a critical role in implementing AI regulation by providing a structured framework that helps governments and regulatory bodies address the challenges associated with AI, including addressing risk management in AI development and deployment, as well as in ensuring interoperability, establishing safety and quality, providing guidance on ethical and fair use, helping define accountability and liability, serving as reference for compliance requirements, and helping to enable regulatory agility.

Such standards can complement NIST's work and charge to develop voluntary standards for testing and validating AI in federal acquisitions, thereby helping to reduce possible duplication of standards development efforts and outputs; serving as a foundation for innovation/building blocks or reference for NIST standards work; and helping reduce the demands (including resources) on NIST.

The value of having NIST recognize industry led standards that have been developed and adopted through an open, transparent, inclusive multi stakeholder approach will enable NIST to leverage:

- Market-Driven Solutions – Industry standards that capture the evolving nature of AI capturing the complexities and risks to balance innovation with market needs and ethical demands.
- Expertise and Innovation – Industry standards are developed by experts who have direct, specialized knowledge and experience with the technologies and practices resulting in more effective, innovative, and applicable standards.
- Flexibility and Adaptability – Industry developed standards respond to technological advancements and market changes allowing for standards that are more current and adaptable to changes and emerging technology.
- Global Compatibility – Industry developed standards are developed to operate on a global scale to facilitate international trade and cooperation providing economic

opportunities and benefits while strengthening American leadership
- Compliance – An industry adopted standards-based approach in developing and deploying product development and compliance standards can mitigate potential risks as well provide a framework that can be used to as to enable interoperability between products and within systems

While regulation is essential, rigid regulation can hinder innovation. Well-designed industry adopted standards minimize disparities in how AI systems are deployed and used across different regions, ensuring a baseline level of AI safety and security to be established that are based on defined ethical considerations and interoperability requirements, including reducing risks associated with the design, operational use, and application of AI.

At IEEE SA, our community has developed resources and standards globally recognized in the use and application of AI systems, establishing principles and frameworks for internationally recognized and adopted standards that adhere to the WTO Agreement on TBT Code of Good Practice and the TBT Committee Decision on Principles for the Development of International Standards.

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> For example: IEEE P3119™, Standard for the Procurement of AI and Automated Decision Systems, which establishes a uniform set of definitions and a process model for the procurement of Artificial Intelligence (AI) and Automated Decision Systems (ADS) by which government entities can address socio-technical and responsible innovation considerations to serve the public interest. The process requirements include a framing of procurement from an IEEE Ethically Aligned Design (EAD) foundation and a participatory approach that redefines traditional stages of procurement as: problem definition, planning, solicitation, critical evaluation of technology solutions (e.g. Impact assessments), and contract execution. The scope of the standard not only addresses the procurement of AI in general, but also government in-house development and hybrid public-private development of AI and ADS as an extension of internal government procurement practices.

IEEE SA would also like to note per OMB Circular A119, government agencies are directed to use voluntary consensus standards in lieu of government-unique standards except where inconsistent with law or otherwise impractical. It also provides guidance for agencies participating in voluntary consensus standards bodies and describes procedures for satisfying the reporting requirements in the Act.

IEEE has a portfolio of standards that may be of interest to NIST, that includes

IEEE 7000™, Standard Model Process for Addressing Ethical Concerns during System Design incorporates a set of processes by which organizations can include consideration of ethical values throughout the stages of concept exploration and development Processes incorporated in the standard provide for traceability of ethical values in the concept of

operations, ethical requirements, and ethical risk-based design are described in the standard.

IEEE **7001-2021** Standard for Transparency of Autonomous Systems establishes measurable, testable levels of transparency, so that autonomous systems can be objectively assessed, and levels of compliance determined.

IEEE **7002-2022** Standard for Data Privacy Process contains requirements for a systems/software engineering process for privacy-oriented considerations regarding products, services, and systems utilizing employee, customer, or other external user's personal data.

IEEE P7003™ Algorithmic Bias Considerations describes specific methodologies to help users certify how they worked to address and eliminate issues of negative bias in the creation of their algorithms, where "negative bias" infers the usage of overly subjective or uniformed data sets or information known to be inconsistent with legislation concerning certain protected characteristics (such as race, gender, sexuality, etc); or with instances of bias against groups not necessarily protected explicitly by legislation, but otherwise diminishing stakeholder or user well-being and for which there are good reasons to be considered inappropriate.

IEEE P7004™ Standard for Child and Student Data Governance provides stakeholders with certifiable and responsible child and student data governance methodologies.

IEEE P7004.1™ Recommended Practices for Virtual Classroom Security, Privacy and Data Governance provided best practices for meeting the requirements of IEEE P7004: Standard for Child and Student Data Governance when designing, provisioning, configuring, operating, and maintaining an online virtual classroom experience for synchronous online learning, education,

IEEE **7005-2021** Standard for Transparent Employer Data Governance contains specific methodologies to help employers in accessing, collecting, storing, utilizing, sharing, and destroying employee data, including specific metrics and conformance criteria regarding the types of uses from trusted global partners and how third parties and employers can meet them.

IEEE **7007-2021** Ontological Standard for Ethically Driven Robotics and Automation Systems contains a set of ontologies with different abstraction levels that contain concepts, definitions, axioms, and use cases that assist in the development of ethically driven methodologies for the design of robots and automation systems.

IEEE P7008™ Standard for Ethically Driven Nudging for Robotic, Intelligent and Autonomous Systems establishes a delineation of typical nudges (currently in use or that could be created). It contains concepts, functions and benefits necessary to establish and ensure ethically driven methodologies for the design of the robotic, intelligent and autonomous systems that incorporate them.

IEEE P7009™ Standard for Fail-Safe Design of Autonomous and Semi-Autonomous Systems establishes a practical, technical baseline of specific methodologies and tools for the development, implementation, and use of effective fail-safe mechanisms in autonomous

and semi-autonomous systems. The standard includes (but is not limited to): clear procedures for measuring, testing, and certifying a system's ability to fail safely on a scale from weak to strong, and instructions for improvement in the case of unsatisfactory performance.

IEEE **7010-2020** Recommended Practice for Assessing the Impact of Autonomous and Intelligent Systems on Human Well-Being provides specific and contextual well-being metrics that facilitate the use of a Well-Being Impact Assessment (WIA) process in order to proactively increase and help safeguard human well-being throughout the lifecycle of autonomous and intelligent systems (A/IS).

IEEE P7010.1™ Recommended Practice for Environmental Social Governance (ESG) and Social Development Goal (SDG) Action Implementation and Advancing Corporate Social Responsibility provides recommendations for next steps in the application of IEEE Std 7010, applied to meeting Environmental Social Governance (ESG) and Social Development Goal (SDG) initiatives and targets. It provides action steps and map elements to review and address when applying IEEE 7010. This recommended practice serves to enhance the quality of the published standard by validating the design outcomes with expanded use. It provides recommendations for multiple users to align processes, collect data, develop policies and practices and measure activities against the impact on corporate goals and resulting stakeholders.

IEEE P7011™ Standard for the Process of Identifying and Rating the Trustworthiness of News Sources provides semi-autonomous processes using standards to create and maintain news purveyor ratings for purposes of public awareness. It standardizes processes to identify and rate the factual accuracy of news stories in order to produce a rating of online news purveyors and the online portion of multimedia news purveyors.

IEEE P7012™ Standard for Machine Readable Personal Privacy Terms identifies/addresses the manner in which personal privacy terms are proffered and how they can be read and agreed to by machines.

IEEE P7014™ Standard for Ethical considerations in Emulated Empathy in Autonomous and Intelligent Systems defines a model for ethical considerations and practices in the design, creation and use of empathic technology, incorporating systems that have the capacity to identify, quantify, respond to, or simulate affective states, such as emotions and cognitive states. This includes coverage of 'affective computing', 'emotion Artificial Intelligence' and related fields.

IEEE P7015™ Standard for Data and Artificial Intelligence (AI) Literacy, Skills, and Readiness establishes an operational framework and associated capabilities for designing policy interventions, tracking their progress, and empirically evaluating their outcomes. The standard includes a common set of definitions, language, and understanding of data and AI literacy, skills, and readiness.

IEEE SA also has several reports relative to ethically aligned design (EAD) that might be of interest:

- **EAD For Artists**

- **EAD For Business**

- **EAD, First Edition**

    o **EAD Chapters**

- **EAD, First Edition – Overview**

- **Defining A/IS Ethics – Glossary**

If you have questions, please do not hesitate to contact Karen Mulberry at k.mulberry@ieee.org.