

22 September 2023

The Honorable Bill Cassidy, M.D.
Ranking Member
Senate Health, Education, Labor, and Pensions Committee
United States Senate
428 Senate Dirksen Office Building
Washington, DC 20510

RE: Senate Committee on Health, Education, Labor, and Pensions White Paper: *Exploring Congress' Framework for the Future of AI: The Oversight and Legislative Role of Congress over the Integration of Artificial Intelligence in Health, Education, and Labor*

Via E-Mail: HELPGOP_AIComments@help.senate.gov

Dear Ranking Member Cassidy,

The IEEE Standards Association (IEEE SA) welcomes the opportunity to respond to the questions that the Senate Committee on Health, Education, Labor, and Pensions posed in its White Paper.

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 process that engages industry and brings together a broad stakeholder community.

The deployment of large language models and other generative artificial intelligence (AI) applications have precipitated the need for appropriate standards and measures that should be taken to ensure scientific integrity and the safety of the public.

As a neutral global technical organization and a champion of standards and engineering excellence, IEEE SA believes it is necessary to harness the benefits of Artificial Intelligence (AI) while protecting against harmful uses. We are engaged in forward-looking measures to establish necessary standards and guidelines for ethically aligned and age-appropriate design, and work to address issues that require an informed public dialogue and remediate action.

Since 2016, IEEE, through the IEEE SA, has been developing a wide range of standards and methods to address safety, biases, transparency, privacy, and corporate governance. These tools can be used also to address many of the publicly debated issues of AI governance.

IEEE SA offers the following responses to help inform the questions posed by the HELP Committee:

- Global Standards Development Organizations (SDOs) such as IEEE, play a very important role in fostering emerging technology such as the development of AI standards.

- New technology comes with unknown obstacles and unintended risks requiring accountable design and lifecycle planning to ensure responsible innovation. As artificial intelligence, autonomous intelligent systems (AIS), machine learning, autonomous vehicles, and robotics advance at a rapid pace, careful considerations need to be made during development and implementation regarding humanity.
- It is important that policymakers be aware of the evolving nature of AI and the complexities in standardizing such technologies, and balance enabling innovation with ensuring ethical considerations are followed.
- IEEE SA has developed resources and standards globally recognized in the area of applied ethics and systems engineering and continues to develop accessible and sustainable approaches and solutions for pragmatic application of AIS principles and frameworks. The first edition of the IEEE SA, *Ethically Aligned Design*, published in 2018, included a glossary that defines AI ethics.
- IEEE SA also contributed to the development of the National Institute of Standards (NIST) AI Risk Management Framework, noting the IEEE standards and work programs and their outputs that define responsible and ethical approaches to manage AI risk.
- IEEE SA offers recognized AIS standards that are developed to ensure consistency, transparency, and accountability in AI system development as well as the mechanism to update standards in line with technological advancements. The value of adhering to a standards-based approach in developing and deploying AI is that product development and compliance to standards can help mitigate potential risks as well as enable interoperability between products and within systems.
- IEEE SA offers [IEEE CertifEd™](#), a certification program that verifies criteria and methodology for the assessment and certification of AI against ethical risks.
- The Committee's questions on the approach to take for the use of AI in medical devices and development of new drugs and biologics raises risks that must be considered before AI innovation can be applied and regulations updated. It is very important for strict ethical codes and standards to be adopted and followed to prevent the creation of dangerous sequences, whether by accident or intention. This also applies to AI safety as existing product safety standards and regulations should be adopted and applied to AI implementation. We suggest that regulatory and legislative efforts should set universal safety and quality standards ensuring products and companies avoid compromise; including potential incentives to exceed these standards.
- As to bias in AI decision-making, the integrity and accuracy of data used by AI is paramount. Data should reflect reality and remain untampered while broad enough to be representative of diverse populations and environments. AI algorithms must continuously evolve adapting to new information and data sets and test data sets against ethical standards. Stakeholder engagement and transparent reporting will contribute to a more equitable AI ecosystem. Ethical guidelines and standards such as [IEEE P7003™ Algorithmic Bias Considerations](#) can serve as a roadmap for fair AI development, emphasizing principles like transparency, fairness, and accountability.
- While regulation is essential, rigid regulation can hinder innovation. Well-designed international standards could minimize disparities in how AI systems are deployed and used across different regions, ensuring a baseline level of ethical considerations are met worldwide and enhance interoperability.

IEEE has a portfolio of standards that may be of interest as the Committee considers a framework for the future of artificial Intelligence (AI). These include:

[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 unformed 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](#)
 - [EAD Chapters](#)
- [EAD, First Edition – Overview](#)
- [Defining A/IS Ethics – Glossary](#)

We would look forward to further discussions with the Committee. If you have questions, please do not hesitate to contact Erica Wissolik at e.wissolik@ieee.org or (202) 530-8347.