Communique of the IEEE Standards Association (IEEE SA)
on Generative Artificial Intelligence Applications
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The deployment of large language models and other generative artificial intelligence (AI) applications has precipitated a worldwide conversation about the benefits and possible harms of AI systems, as well as the need for appropriate standards and measures that should be taken to ensure scientific integrity and the safety of the public.

Guided by the vision of our founders, as a neutral global technical organization and a champion of standards and engineering excellence, IEEE SA believes that 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.

AI generative models leverage both established and cutting-edge computational techniques, offering immense potential across various sectors, including industry, education, and humanitarian initiatives, and can improve accessibility, as well as inclusivity in content creation.

Despite their promise, generative AI models raise serious ethical concerns and display profound limitations. AI systems integrate data, algorithms of varying complexity, sensors, and actuators – each with inherent values, biases, and unanticipated impacts when introduced into ever-changing socio-technical environments. We are therefore concerned that flawed systems may be embedded in the fabric of daily life before the necessary technological guardrails and societal safeguards are in place. Over the past few years, 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 could be used also to address many of the publicly debated issues of quality assurance of Large Language Models. An example is IEEE P7009™[1], a standards project in development for Fail-Safe Design of Autonomous and Semi-Autonomous Systems that 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.

Given the evident impact that AI-supported applications have on our democratic institutions, societal cohesion, and the mental health of our children, we should not understate the importance of these new advances in AI research and development. It is against this backdrop that we express our deep concern that current iterations of AI technologies are far from mature and trustworthy.

To prevent harmful outcomes, we posit that it is imperative for developers, users, and regulators to address ethical and societal concerns. Transparency is one particularly essential criterion, requiring detailed information about a model's corpus, architecture, guardrails, and policies for handling data, particularly data and code provenance using proper watermarking methodologies and systems. In addition, the use of AI to develop and propagate misinformation should also be addressed.

In this era where we increasingly rely on AI systems, we view it essential for governments, industry, scientists, and engineers worldwide to assume their share of responsibility, and recognize the

[1] https://standards.ieee.org/ieee/7009/7096/

significance of openness, international collaboration, and critical discourse in their development and use.

This public policy communication was developed by the IEEE SA and IEEE President-elect Thomas Coughlin and represents the considered judgement of a group of IEEE members with expertise in the subject field. The statements taken by IEEE SA do not necessarily reflect the views of IEEE or its other Organizational Units.

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