IEEE Public Policy Position Statement

Ethical Considerations of Autonomous Intelligent Systems (AIS)
6 April 2023

IEEE supports the inclusion of ethical considerations in the design and deployment of Autonomous Intelligent Systems (AIS).

Autonomous Intelligent Systems (AIS) systems are machine-based systems that are capable of influencing the environment by producing an output for a given set of objectives[1]. In general, AIS are being created that are capable of adaptation and learning based on feedback and data from their environment. These systems hold great promise to benefit society in application domains as diverse as transportation, health and social care, environmental preservation, enterprise productivity, communication network optimization, power grid adaptation and management, agriculture, manufacturing, and entertainment.

By improving prediction, optimizing operations and resource allocation, and personalizing service delivery, use of AIS can prioritize support for socially and environmentally beneficial outcomes and provide technological opportunities for companies and governments. However, the same elements and techniques that power the socio-economic benefits of AIS can also bring about new risks or negative consequences for individuals or society if ethical design principals are not applied.

AIS technologies are powering impressive advances in many industries. To ensure that AIS are deployed responsibly, developers and operators of AIS need to be aware of consensus-based global best technical practices, standards, and conformity assessment and certification schemes that recognize and align with end-users' and citizens' values when building and deploying AIS. To that end IEEE supports:

- The development of technological communities, the development and dissemination of research and development products, the promulgation of technical best practices, the development of educational programs and the development of technical standards and conformity assessment programs that can extend the capacity of AIS developers and operators to deploy the benefits of such systems in a manner that respects and acknowledges the obligation to hold accountable these systems in their human, social and environmental context.
- Efforts that encourage and facilitate a global, inclusive, and informed dialogue between technological communities, policy makers, regulators, legal professionals, ethicists, philosophers, economists, community representatives, end users and other interested parties regarding best practices for the ethically aligned design of AIS.

---

[1] https://www.oecd.org/digital/artificial-intelligence/

- The consensus process of, and assets produced through, the IEEE Global Initiative on Ethical Aspects of Autonomous and Intelligent Systems[2] and continues to engage the broader IEEE community in this area through efforts such as:
  - "Ethically Aligned Design – A Vision for Prioritizing Human Well-being with Autonomous and Intelligent Systems." [3]
  - IEEE global standards that focus on environmental, societal, and ethical issues associated with a certain field of technology.[4]
  - The IEEE ethical certifications for AI-driven systems and organizations[5].
  - Technology efforts across IEEE Societies and Councils, including the IEEE Computer Society, IEEE Computational Intelligence Society, IEEE Robotics and Automation Society, IEEE Society on the Social Implications of Technology and their associated Technical Conferences and Journals.
  - IEEE Tech Ethics program, which seeks to ensure that ethical and environmental societal implications of technology become an integral part of the development process by driving conversation and debate on these issues.[6]

IEEE endorses the principle that design, development and implementation of AIS should be undertaken with consideration for the societal consequences and safe operation of systems with respect to:

- Human Rights–AIS shall be created and operated to respect, promote, and protect internationally recognized human rights.
- Well-being–AIS creators shall adopt increased human well-being as a primary success criterion for development.
- Data Agency–AIS creators shall empower individuals with the ability to access and securely share their data, to maintain people's capacity to have control over their identity.
- Effectiveness–that AIS is being effective and fit for its intended purpose.
- Transparency–The basis of a particular A/IS decision should always be discoverable.
- Accountability–AIS shall be created and operated by industry, academia, and other bodies to provide an unambiguous rationale for all decisions they made.
- Awareness of Misuse–AIS creators shall guard against all potential misuses and risks as well as provide effective mitigation of harms caused by AIS in operation.
- Competence–AIS creators shall specify, and operators shall adhere to the knowledge and skill required for safe and effective operation

The IEEE Code of Ethics (IEEE Policies Section 7.8)[7] is explicit in referencing IEEE's commitment to ethical design and to the societal implications of intelligent systems, and states in part: *We, the members of the IEEE, in recognition of the importance of our technologies in affecting the quality of life throughout the world, and in accepting a personal obligation to our profession, its members, and the communities we serve, do hereby commit ourselves to the highest ethical and professional conduct and agree:*

---

[2] https://standards.ieee.org/industry-connections/ec/autonomous-systems/

[3] https://ethicsinaction.ieee.org/?utm_campaign=EAD1e&utm_medium=PR&utm_source=Web&utm_content=geias

[4] https://standards.ieee.org/initiatives/artificial-intelligence-systems/standards/

[5] https://engagestandards.ieee.org/ieeecertifaied.html

[6] https://techethics.ieee.org/

[7] https://www.ieee.org/about/corporate/governance/p7-8.html

- to hold paramount the safety, health, and welfare of the public, to strive to comply with ethical design and sustainable development practices, and to disclose promptly factors that might endanger the public or the environment;
- to improve the understanding by individuals and society of the capabilities and societal implications of conventional and emerging technologies, including intelligent systems.

IEEE is committed to developing trust in technologies through transparency, technical community building, and partnership across regions and nations, as a service to humanity. Measures that ensure AIS are developed and deployed with appropriate ethical consideration for human and societal values will enhance trust in these technologies, which in turn will increase the ability of the technologies to achieve much broader societal impacts.

In parallel with our commitment to the ethical aspects of designing, developing, and deploying AI systems, IEEE supports the development of AI technology and its application to advance the interests of society, and offers specific recommendations for public policy makers in a separate IEEE Position Statement entitled Artificial Intelligence[8].

About IEEE
IEEE is the world's largest technical professional organization dedicated to advancing technology for the benefit of humanity. Through its highly cited publications, conferences, technology standards, and professional and educational activities, IEEE is the trusted voice in a wide variety of areas ranging from aerospace systems, computers, and telecommunications to biomedical engineering, electric power, and consumer electronics.

---

[8] https://globalpolicy.ieee.org/wp-content/uploads/2019/06/IEEE18029.pdf