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| **Document Title:** | **Keynote: Imbuing Trust and Ethical Values in the Design of Standardized Technology Platforms: A 21st Century Challenge** |
| **Source:** | Karen Bartleson, 2017 IEEE President  |
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I want to add my welcome to the 21st Global Standards Collaboration meeting and to the new IEEE European office here at the Austrian Standards Institute Meeting Center. Thank you for your participation in GSC-21. My name is Karen Bartleson, and I am the president of IEEE. On behalf of our more than 420,000 members in over 190 countries, I want to express how thankful we are to have you here.

Over today and tomorrow, we will be hearing from one another about communications technologies and artificial intelligence in autonomous systems—or “AI” and “AS”—as well as their application in environments such as smart cities, and I am so excited to learn from you. I would like to ground and contextualize our gathering within the theme of “Building Trust and Ethical Values in the Design of Standardized Technology Platforms.”

Ethics in design is, of course, a crucial 21st-century challenge facing the global engineering community. I believe I can say “of course” in that statement because many, if not all, of the people in this room would generally agree with it. Your actions prove as much. Many of the organizations represented here in Vienna today are already at work in the ethics-in-design space, and IEEE is honored that you join us in this pressing, multi-faceted and globally shared challenge.

Ethics and technology are not exactly new areas for IEEE. Our commitment to advancing technology to benefit humanity has guided IEEE and our predecessor societies from the early days of their formation more than 100 years ago. In fact, IEEE adopted its first code of ethics in 1914.

But it is also true that the membership of IEEE and really the entire global technology ecosystem are confronting a significantly different challenge in terms of ethics in design with regard to artificial intelligence and autonomous systems. The ongoing development of powerful technologies and disruptive innovations in AI/AS demands a sharper focus on social responsibility and accountability from the global technology community than ever before.

AI/AS is different from technologies developed in the past. For example, the process of how algorithms track our behavior is often hidden by design. This opaque and self-learning nature of AI/AS work does not necessarily denote any negative behavior, but, because personalization is supposed to appear somewhat magical for users, the humans who use AI/AS cannot be fully cognizant of why certain choices they have made affect how the technology behaves. Also, the emergence of unintended consequences could be vastly accelerated through AI/AS technologies as we are hearing from a few famous people. When an algorithm is created to be self-learning in some way, it means that programmers or manufacturers may not always fully understand the implicit biases or actions a certain technology may take when powered by AI/AS. These are just a couple of examples of why ethical considerations at the front end of the design process must become essential in AI/AS innovation.

There is no doubt that development and rollout of AI/AS stand to transform the ways that humans everywhere work, play, and think over the coming years. Recent developments in AI-focused areas herald its full-fledged arrival via autonomous automobiles, cognitive computing, and collaborative robotics. And already—as with any disruptive innovation—AI is presenting a number of complex public policy challenges, in terms of our moral values and ethical principles, which require extensive knowledge of science and technology for effective decision-making. These issues span a diverse spectrum of applications including agriculture, communications, energy, the environment, health care, and transportation.

Now let’s realize this vision 10 years into the future. Imagine it is the year 2027. Driverless cars, drones, and unmanned aircraft have transformed the movement of things and people. We are solidly on pace to reach or maybe even exceed the United Nations’ projection of more than 6 billion people living in cities by the year 2045,[[1]](#footnote-1) and, to help ensure safe and sufficient services, connectivity has grown ubiquitous across smart cities, smart buildings, smart cars and even through sensors on or in human bodies. In the medical field, AI is being used to find patterns in medical data, diagnose diseases, and suggest treatments to improve patient care and health outcomes. Surgical robots are extending the surgeon’s capacities, adding reliability, and reducing human error. AI is providing seamless control for robotic limbs, improving the connection between human and prosthetic. AI, furthermore, is being used to streamline disaster response, directing surveillance drones, compiling and analyzing data, and deploying teams, and robots are employed to search for victims, provide reconnaissance, and explore areas unsafe for humans.

As a person who believes in the power of technology to benefit humanity, I find this to be a very compelling vision. I think most of you in this room do, too. But I think we can also agree that it’s a challenging vision, as well. The potential benefits for quality of life are breathtaking; the ethical questions to be solved, however, are daunting:

* Who determines when and how AI/AS can be used?
* Who monitors AI/AS development and expansion?
* Who ensures compliance with safety standards?
* Who takes responsibility when AI/AS malfunctions?
* What safeguards are in place to protect the massive amount of data and personal information needed to power AI/AS?

With today’s outset of AI/AS proliferation around the globe, such questions illustrate the pressing need for deep conversation and open, balanced collaboration today among diverse stakeholders … the AI/AS experts who understand the technologies … the policy makers who devise the regulatory environment … the public who have varying levels of interaction and acceptance of AI/AS. If we are to realize the best version of the world’s AI/AS vision, it is imperative that we comprehensively address the ethical challenge today. Ethics must be a non-negotiable part of our composition as engineers and scientists. Ethics in design must be as ingrained within us as any other guiding precept.

As are many of the other organizations represented in this room today, IEEE is already working to prioritize the maximum benefit of AI/AS to humanity and the natural environment, while mitigating the risks and negative impact as AI/AS evolves. Rudi Schubert, the IEEE-SA’s director, new initiatives, will be speaking later during GSC-21 on IEEE work in artificial intelligence and autonomous systems and provide details, for example, our IEEE P7000™ series standards in this area. Globally open and balanced standardization processes allow multiple stakeholders to come together and create a roadmap of sorts to help people and organizations navigate complex situations.

Let me just say for now that the work being done today across the IEEE Global Initiative for Ethical Considerations in Artificial Intelligence and Autonomous Systems and other IEEE activities contributes to a broad effort being advanced at IEEE to foster an open, expansive, and inclusive conversation about ethics in technology, known as the IEEE TechEthics program. Launched last year, the program aims to coordinate and drive institute-wide activities in technology ethics. We want to address a widespread ethics landscape—from developing professional guidelines to assessing societal impacts to considering technological implementation. And we will continue to advocate for technologies that benefit humankind around the globe.

I would like to quickly read the opening paragraph of IEEE’s Code of Ethics:

*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…*

In that short paragraph, IEEE spells out what it holds in high regard: integrity … ethics … responsible behavior … the obligation IEEE has—as the world’s largest technical professional organization dedicated to advancing technology for the benefit of humanity—to actually live those values.

For me, there is a simple equation: A person does not have “some” ethics—you are either ethical, or you are not. An ethical person does not stand idly by when lives could be affected by their action or inaction; they take action for those who will never learn of their choices.

Some may say that it is acceptable to compromise one’s ethics in pursuit of a greater good. A benefit to the greater good is, after all, difficult to argue against, since the ultimate result will help many, while negatively affecting few.

However, this is a position that we, as stewards for the advancement of technology, must not assume. If even one person suffers because an engineer or scientist acts in an unethical manner, the cost is too high.

We all know that there will always be an element of humanity that misuses technology—or uses it naively. And I understand that we all bring different perspectives to the practice of ethics, and what is a “right’ choice, as we would define it.

But at the core of all of this must lay a deep and abiding commitment to the health, well-being, and future of our families, our communities, and our world. There are many ways for you to engage in IEEE or other organizations’ activities in ethics in design. I urge you to find the right place for you to apply your talents and share your insights and experience.

And, again, welcome to the IEEE European office and GSC-21. Thank you for your partic

1. <http://www.un.org/en/development/desa/news/population/world-urbanization-prospects-2014.html> [↑](#footnote-ref-1)