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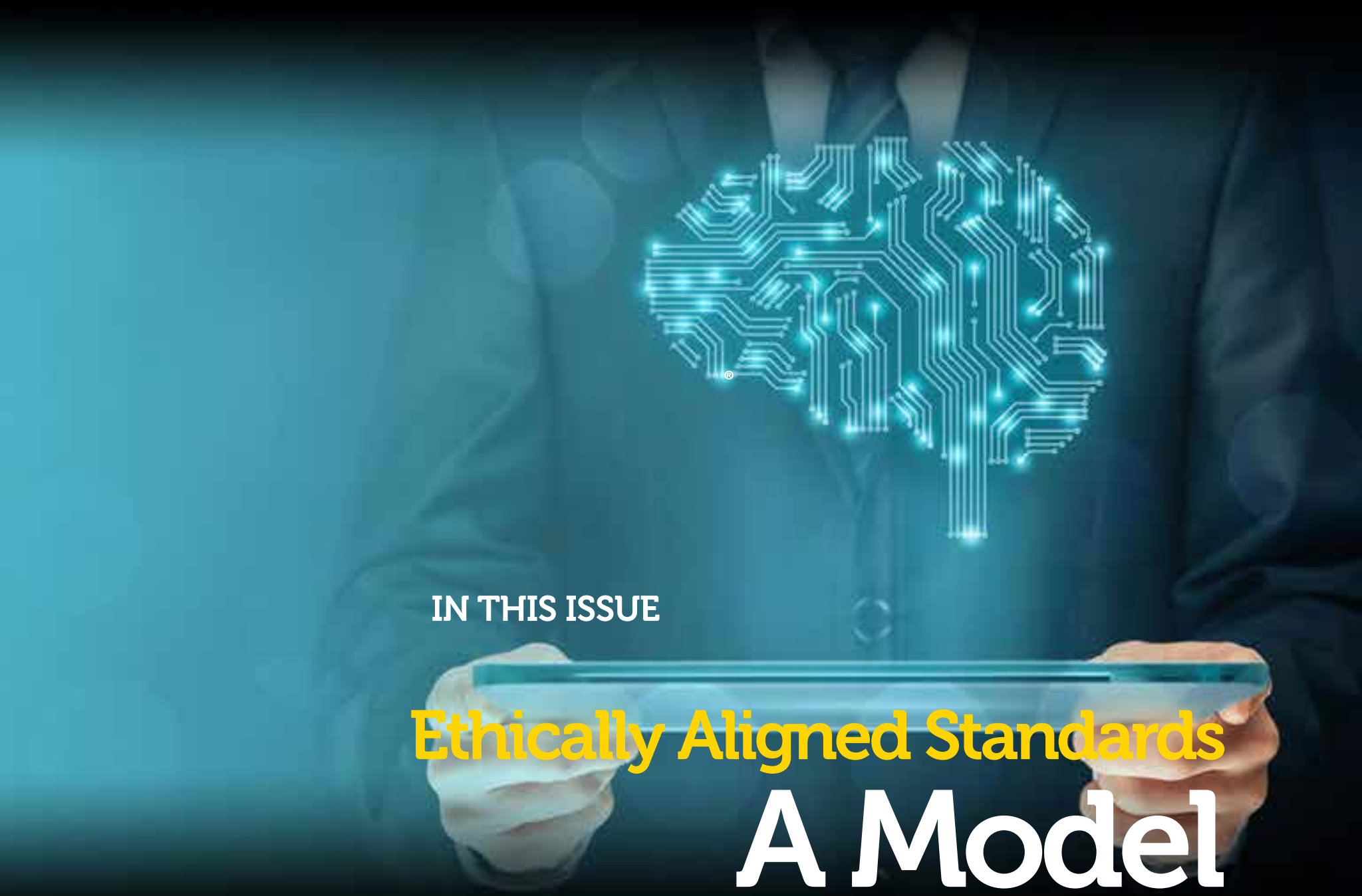
Ethically Aligned Standards



IN THIS ISSUE

Ethically Aligned Standards

A Model for the Future

IEEE

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Technical standards are formal documents that establish uniform engineering or technical criteria, methods, processes and practices developed through an accredited consensus process. The purpose of this publication is to help raise awareness of standards, show the importance of standards, present real-world applications of standards, and demonstrate the role you can play in the standards development process. Knowledge of standards and standards activities can help facilitate your professional engineering practice and improve technological developments to meet the needs and improve the lives of future generations.

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CONTENTS

Letter from the Editor

Standards for the Virtual World

All of us are taught ethics through moral stories in our childhood. Many professions such as engineering, medicine, and law teach a "code of ethics," and many businesses have a formal code of ethics in their collection of policies. While these ethical standards are applied largely to an individual's behavior in interacting with peers or customers, they rarely push individuals to reflect on the considerations applied to designing or certifying a product. Falsifying product performance, emission reports, or breaching data security to access private information are all well-known examples of an engineering organization's actions having directly harmed people as individuals or society as a whole. As "smart" gadgets along with their corresponding infrastructure continue to develop, one has to worry about the conscious or unconscious misuse and harm this may cause.

In the same way that we expect all individuals to operate with a moral code, we must also work to make engineering professionals and technologists aware of the ethical implications of their decisions for product design. IEEE, the world's largest technical professional organization dedicated to advancing technology for the benefit of humanity, recently undertook the enormous task of addressing this gap in personal ethics versus designing ethically-aligned products. To begin with, we must agree on several definitions to enable the dialog in this domain, establish a framework for ethical considerations, and provide guidelines to technology developers and product designers who may be experts at the engineering tasks, but unaware of the ethical dilemmas created by some of their well-intentioned inventions and innovations.

Current effort under IEEE is focused on ethically-aligned design for artificial intelligence applications and automated systems. Three working groups have been formed under the IEEE Standards Association (IEEE-SA). Dr. Konstantinos Karachalios, Greg Adamson, and John Havens provide us with some early insight into these efforts. Interestingly, some of the guiding principles are based on the active research of Professor Sarah Spiekermann, chair of the Institute for Management Information Systems at Vienna University of Economics and Business. Her "values-based system design" approach can be applied to many disciplines beyond information technology.

Let us not expect we will achieve nirvana if all product designers are ethically aligned. After all, successful products have to be "psychologically catchy" for customers to buy and use them–this is true for individual consumers and businesses. Customer education about ethical considerations in product design will be equally important. As a consumer, how does a product lead you to make ethical use of it or prevents you from making unethical use? Would you pay extra for such products? How much? Why? These and other questions like these are likely to come up as we dive into exploring ethically-aligned designs.

I am sure we will hear more on these topics in years to come. Until then, look for gaps in ethics as you design products or develop new technologies. You are bound to find use cases that are influenced differently based on your local environment.

Yatin Trivedi, Editor-in-Chief, is a member of the IEEE Standards Association Board of Governors (BoG) and Standards Education Committee (SEC), and serves as vice-chair for Design Automation Standards Committee (DASC) under Computer Society. Yatin served as the Standards Board representative to IEEE Education Activities Board (EAB) from 2012 until 2017. He also serves as the Chairman on the Board of Directors of the IEEE-ISTO.

Yatin currently serves as Associate Vice President for semiconductor design services at Aricent Inc. Prior to his current assignment, Yatin served as Director of Strategic Marketing at Synopsys where he was responsible for corporate-wide technical standards strategy. In 1992, Yatin co-founded Seva Technologies as one of the early Design Services companies in Silicon Valley. He co-authored the first book on Verilog HDL in 1990 and was the Editor of IEEE Std 1364-1995™ and IEEE Std 1364-2001™. He also started, managed and taught courses in VLSI Design Engineering curriculum at UC Santa Cruz extension (1990-2001). Yatin started his career at AMD and also worked at Sun Microsystems.

Yatin received his B.E. (Hons) EEE from BITS, Pilani and M.S. Computer Engineering from Case Western Reserve University. He is a Senior Member of the IEEE and a member of IEEE-HKN Honor Society.

Ethically Aligned Standards

- A Model for the Future

by John C. Havens

In April of 2016, The IEEE Global Initiative for Ethical Considerations in Artificial Intelligence and Autonomous Systems (AI/AS) was launched with a mandate to provide a document that could provide technologists with a pragmatic guide to deal with the pressing ethical considerations of AI/AS. Although it is not a professional code of ethics, the IEEE Global Initiative has created the first version of this document called, EthicallyAligned Design, featuring over eighty specific Issues and Recommendations written by more than 100 global thought leaders in AI/AS, ethics, policy, academia and business. The purpose of the IEEE Global Initiative is to ensure that every technologist is educated, trained, and empowered to prioritize ethical considerations in the design and development of autonomous and intelligent systems. Ethically Aligned Design was created as a complement to traditional codes of ethics,

to aid and empower engineers not familiar with these technologies to increase innovation while diminishing negative consequences in their work.

As a pragmatic way of complementing Ethically Aligned Design, the IEEE Global Initiative believes that prioritizing applied ethical considerations at the front end of any system or product development process will redefine innovation for the algorithmic era to encourage excellence and integrity in all of the technology we design for a positive and healthy human future. This means technologists will have the opportunity to use methodologies that provide more rigorous due diligence regarding the values of stakeholders and end users than they may be using today.

Examples of methodologies along these lines include Value Based Design, Value Sensitive Design and Responsible Research and Innovation (RRI). As the RRI Tools website notes, this means "involving society in science and innovation 'very upstream' in the processes of R&I to align its outcomes with the values of society." The goal of the IEEE Global Initiative is to institutionalize the rigors of this "upstream analysis" to further aid the scientists and engineers involved in the creation of the intelligent, autonomous, and other emerging technologies driving our human future.

To help steer this alignment process, the IEEE Global Initiative recommended ideas for Standards projects* that became the IEEE P7000™ series of Standards Recommendations based on Ethically Aligned Design.

The series to date includes the following:

- **IEEE P7000™**: Model Process for Addressing Ethical Concerns During System Design
  (Working Group already in process)

- **IEEE P7001™**: Transparency of Autonomous Systems
  (Working Group already in process)

- **IEEE P7002™**: Data Privacy Process
  (Working Group already in process)

*Only the IEEE Standards Association (IEEE-SA) can actually create Standards–the IEEE Global Initiative makes recommendations for Standards that become Working Groups once approved.

IEEE P7000™

IEEE P7000™ provides a seminal opportunity for technologists to imbue their systems development process with prioritized ethical considerations. Here are specifics regarding IEEE P7000™, a **Model Process for Addressing Ethical Concerns During System Design**:

Purpose of the project: Innovation teams, including engineers, technologists, and other project stakeholders need a methodology for turning ethical concerns around technology into values for corporate technology strategy. They need to know how to enrich system analysis and design with the identification, analysis and reconciliation of ethical impact dimensions.

The purpose of this Standard is to enable the pragmatic application of this type of Value-Based System Design. The methodology developed in this effort demonstrates how a conceptual

analysis of values and an extensive feasibility analysis can help to refine ethical system requirements in systems and software life cycles. P7000 will provide engineers and technologists with an implementable process aligning innovation management processes, IS system design approaches and software engineering methods to minimize ethical risk for organizations, stakeholders, and end users.

Need for the project: Engineers and their managers, as well as other stakeholders, benefit from a well-defined process for considering ethical issues early in the system life cycle. Consumers are not trained to think of the ethical considerations regarding the products and services they use–it is only by rigorously examining ethical concerns that manufacturers, engineers, and technologists can best ensure products and services are as safe and relevant for end users as possible. It should be noted up to this point there is no IEEE Standard offering a process model for engineers to consider ethical factors affecting their projects.

To provide an example of how this type of ethically-oriented work can function, the diagram in Fig. 1 was created by Professor D. Sarah Spiekermann, who chairs the Institute for Management Information Systems at Vienna University of Economics and Business (WU Vienna). She is also Vice-Chair of the IEEE P7000™ Working Group, and author of the book "Ethical IT Innovation: A Value-based System Design Approach," which features

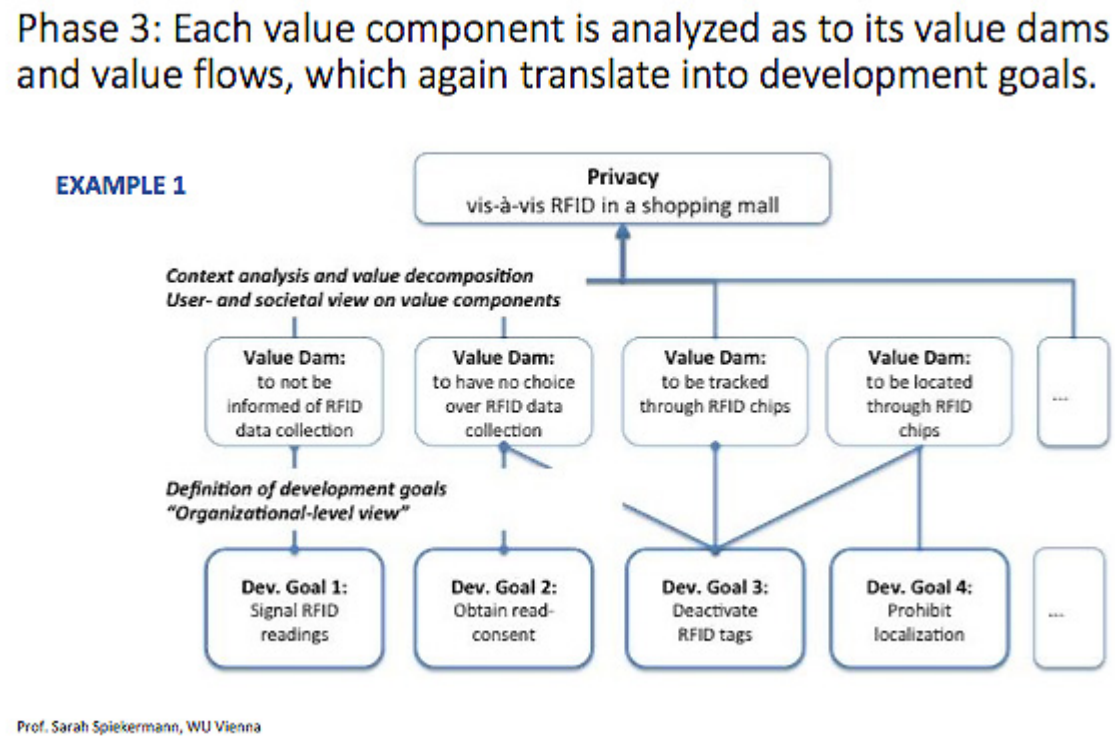

Fig. 1. From Ethical IT Innovation by Sarah Spiekemann (by permission).

a vast repository of research demonstrating the business value of prioritizing ethics at the front end of design.

Although it may seem difficult to create an ethical focus for the system development lifecycle of an organization, it is possible to thoroughly evaluate values like privacy (as shown in Fig. 1). By considering how an end user or stakeholder identifies with a certain value, and by recognizing where "value dams" would keep them from achieving values important to their lives, engineers can proactively and preemptively build AI/AS tools that align with people's ethical and deeply held beliefs.

In this way, the hope of our P7000™ Working Group ("our," as I am the Working Group Chair) is that it will redefine innovation by helping companies focus on values throughout the entire system development life cycle to create more value for customers while avoiding breaches regarding their beliefs and unintended consequences that can be costly from a risk, compliance, or a negative public relations standpoint.

Challenges

There are important challenges our Working Group faces while creating P7000™ that reflect the pressing need to create a methodology that prioritizes ethical considerations for the systems development life cycle.

Firstly is the notion of **awareness**. While professional codes of ethics are firmly established for organizations like IEEE and others that provide robust measures for employee or member values, many technologists are unaware that applied ethical methodologies like values-based design exist. Currently, the word "ethics" can sometimes be frustrating for many engineers as it implies a focus on risk, compliance, or whistle blowing rather than a new way of framing innovation in the algorithmic age.

For this reason, in the IEEE Global Initiative we often say, "ethics is the new green," to reposition our work in a light of business sustainability in a similar fashion as how the green/environmental movement came into the enterprise a decade ago. In this analogy, it is the people (employees and end users of products) we are hoping to sustain by better aligning products and systems to their values in the same way organizations have aligned their core values around sustaining the planet in ways that help define their brand to the marketplace.

A second challenge to tackle is the need for clarity around **definitions**. Understandably, when people first begin thinking about ethical considerations in the workplace, they focus on specific methodologies like utilitarianism or virtue ethics and assume P7000™ will favor one mode of thought over another. However, this is not the case. Rather, it is by mapping overarching values as shown in Sarah's diagram in Fig. 1, that multiple philosophies or methodologies can be applied to try and determine stakeholder and end user values. Once these are identified, these same methodologies can then be used to help prioritize how best to address

issues relating to people's values and the "dams" that could keep them from coming to fruition. This process will also be expanded to try and recognize cultural considerations of a product created in one country that is designed for use globally.

Thirdly is the need to provide **certification** for the P7000™ Standard(s). In the same way an organization can define, implement and validate how they incorporate a system like Agile for Marketing, our goal is to make P7000™ certification along these same lines. Meaning, what an organization can provably demonstrate is their analysis of stakeholder/end user values, and their due diligence to design and build products and services that align to those ethical or preference-based signals. Plus, as products and services created via the P7000™ process begin to be widely used, our hope is to identify qualitative and quantitative metrics demonstrating products and services align to end users based on their direct feedback. This may happen through surveys, societal metrics like the OECD's Well-being Index, or via sensor-based technology reflecting people's use of products and services, and their ethically oriented sentiment via social media or other channels demonstrating their belief that their values are being honored.

Conclusion

The good news is that in all of our work to increase awareness, provide definitions, and create certifications for these ethical considerations, we will be educating technologists on the existence of value-driven design in ways they may not have considered before. Just as important in our algorithmic era, we are hoping to encourage organizations to prioritize human wellbeing by the proactive prioritization of values elicitation and implementation.

It's early days for the Working Group, and we welcome anyone's participation.

John C. Havens is Executive Director of The IEEE Global Initiative for Ethical Considerations in Artificial Intelligence and Autonomous Systems, and Working Group Chair for IEEE P7000™. John is also a regular contributor on issues of technology and wellbeing to Mashable, The Guardian, HuffPo and TechCrunch and is author of Heartificial Intelligence: Embracing Our Humanity To Maximize Machines and Hacking Happiness: Why Your Personal Data Counts and How Tracking it Can Change the World.

John was an EVP of a Top Ten PR Firm, a VP of a tech startup, and an independent consultant where he has worked with clients such as Gillette, P&G, HP, Wal-Mart, Ford, Allstate, Monster, Gallo Wines, and Merck. He was also the Founder of The Happathon Project, a non-profit using emerging technology and positive psychology to increase human wellbeing. John has spoken at TEDx, SXSW Interactive (six times), and as a global keynote speaker for clients like Cisco, Gillette, IEEE, and NXP Semiconductors. John was also a professional actor on Broadway, TV, and film for 15 years.

For more information, visit John's site or follow him @johnchavens.

Advancing Technology for Humanity

- The Human Standard & Artificial Intelligence

by Konstantinos Karachalios

Ethical Standards for AI/AS Development

What does it mean to Advance Technology for Humanity?

While this is an engaging and purposeful tagline for IEEE, the little word "for" has–again and again–to be given meaning and put in action. In the context of "Artificial Intelligence" (AI) the critical question is, "what do we wish to prioritize in the creation of technology in the algorithmic age?" Then we need to act to get it done. As scientists and engineers we have a long and honorable tradition of upholding excellence in what we build.

However, tradition is not sufficient anymore in the age of intelligent machines–the emerging challenges we face also demand a critical and innovative approach towards the process of scientific and technological inquiry itself. Simply doing, and then later thinking about the potentially negative sides of what we have done, may take humanity to places where nobody wants to go, at least consciously.

In the case of AI, it is only by defining the deep ethical considerations we wish to address as a society before we create technology that we can best align with people's values who use it and avoid negative unintended consequences.

To help in this process of societal definition, the IEEE Standards Association (IEEE-SA) launched The IEEE Global Initiative for Ethical Considerations in Artificial Intelligence and Autonomous Systems (AI/AS) in April of 2016. We did this for two key reasons:

1. To move beyond both the fear and the uncritical admiration regarding autonomous and intelligent technologies.
2. To show that aligning technology with ethical values will help advance innovation with these new tools while diminishing fear in the process.

To pragmatically address specific ethical issues in AI/AS, the IEEE Global Initiative on AI Ethics was tasked with two primary deliverables. The first was the creation of Ethically Aligned Design: A Vision for Prioritizing Human Wellbeing with Artificial Intelligence and Autonomous Systems. Given the sensitive and complex nature of the matter, we chose an iterative approach. The first version was created by over 100 AI/Ethics thought leaders from the IEEE Global Initiative and contains over 80 pragmatic Issues and Candidate Recommendations for technologists to use in their work today to create a positive future. It was published as an explicit open call for opinions and feedback via our submission guidelines process, to help inform the creation of the second version.

Along with creating and evolving Ethically Aligned Design, members of the IEEE Global Initiative are encouraged as their second deliverable to recommend standardization projects to IEEE-SA based on their work. Here are titles for each of these standardization projects, and more information is available via the links included. Along with the projects listed below, the IEEE Global Initiative recently submitted three more standardization ideas for consideration:

- IEEE P7000™: Model Process for Addressing Ethical Concerns During System Design (Working Group already in process)
- IEEE P7001™: Transparency of Autonomous Systems (Working Group already in process)
- IEEE P7002™: Data Privacy Process (Working Group already in process)
- IEEE P7003™: Algorithmic Bias Considerations (Project has been approved as a Working Group. More information will be available on The IEEE Global Initiative's website soon.)

From what we have been told, IEEE P7000™ is the first Standard in the history of IEEE that is directly focused on the implementation of applied ethical methodologies to technology. To be clear, this is not to infer that engineers and technologists have not always focused on prioritizing sound ethical practices in the creation of their work. Likewise, IEEE has had a professional code of ethics guiding its work and membership for decades.

But as the purpose of the IEEE Global Initiative states, our goal is to ensure every technologist is educated, trained, and empowered to explicitly prioritize ethical considerations in the design and development of autonomous and intelligent systems. By this we mean that along with a code of ethics providing direction for member behavior, technologists in the algorithmic era need to use methodologies that provide more rigorous due diligence regarding the values of stakeholders and end users than they may be using today. Examples of these methodologies along these lines include Value Sensitive Design and Responsible Research and Innovation (RRI). As the RRI Tools website notes, this means, "involving society in

science and innovation 'very upstream' in the processes of R&I to align its outcomes with the values of society." By creating the IEEE P7000™ series of Standards based on Ethically Aligned Design, our goal is to institutionalize the rigors of this "upstream analysis" to further aid the scientists and engineers involved in the creation of the intelligent, autonomous, and other emerging technologies driving our human future.

The launch of the IEEE Global Initiative and the subsequent development of the IEEE P7000™ family of Standards are pushing the boundaries of the art of consensus building into key facets of the AI/AS ecosystem. These activities contribute to the IEEE TechEthics™ program, which is a broader effort being launched at IEEE to foster an open, broad, and inclusive conversation about ethics in technology. It is because of these efforts of the entire organization to prioritize ethics that we can collectively create a societal standard for our future that truly advances technology for humanity, and for a healthy and innovative future.

Konstantinos Karachalios is an internationally recognized leader within the standards development and intellectual property communities and has extensive expertise in public policy, strategic planning, and the not-for-profit sector. His leadership efforts played a crucial role in the successful international cooperation between Germany and France in the areas of coordinated research and scenario simulation pertaining to large-scale nuclear accidents.

Following the success of these cooperative international endeavors, he joined the European Patent Office (EPO). Among the highlights of his career within the EPO are his creation and leadership of the EPO's International Academy, the Department of Technical Assistance to the Middle East and Africa, and the Bureau for Public Policy Issues, and his guidance and insights as the EPO's envoy to a number of United Nations organizations. As a member of EPO's core taskforce for the "Scenarios for the Future" project, Konstantinos contributed to repositioning the techno-political stakes, reframing the way in which they are debated in the global arena, and initiating and coordinating strategic responses to the challenges raised by those discussions.

Konstantinos earned his Ph.D. in Energy Engineering (Nuclear Reactor Safety) and his master's degree in Mechanical Engineering for the University of Stuttgart.

Ethics and Technology

by Greg Adamson

The year 2018 marks the bicentennial of Mary Shelley's Frankenstein: The Modern Prometheus. Even the worst of the movie renditions retain her key ethical question: What responsibilities do we have for the technologies we create? The "we" includes both technologists and the community as a whole. Shelley chose to focus on the loneliness of a new being. The artificial intelligence (AI) devices we create today are far short of sentience, so our challenges tend to relate to the social impact and the way that the technologies we create will change us.

Ethics and technology have been constant, if not always agreeable, partners for the past century. The twentieth century itself was split in two. Prior to World War II (WWII), a sense of confidence in the narrative of progress guided scientists, technologists, governments, and society in general. Technology would lift us out of poverty, ignorance, and hardship, and provide a world of abundance.

The development and use of nuclear weapons during WWII created a sense of shock, firstly in the scientific and technical communities, and then in the general community. We now, demonstrably, had the capacity to destroy our world. In the aftermath of WWII, technology and community values developed different paths. In 1959, C. P. Snow's The Two Cultures [1] emphasized the difference in a provocative style. Environmental concerns arose in the 1960s, along with other challenges including the "digital divide," a gap between those who gained benefits from technology and those who didn't.

Seeking to address those societal concerns from the technical perspective, in 1972 IEEE established the forerunner to the Society on Social Implications of Technology (SSIT). The 1980s and 1990s saw the rise of new fields of engineering, including environmental engineering and engineering for development. By the early 2000s, awareness of many issues related to ethics and technology had gained broad public awareness, and IEEE adopted the tagline "Advancing Technology for Humanity." Today, SSIT has five areas of focus: (1) technology ethics, (2) development technology, (3) technology sustainability, (4) access to technology, and (5) the impact of emerging technologies.

The twentieth-century discussions of ethics were dialogues about what we should do, given the options available. In this century, the discussion has become much more pressing, examining what we have to do. There are several reasons for this, including the following three:

1. Technology advances. Whether we speak about Moore's Law, the Singularity Function, or simply technology change, the accumulative impact of technological innovation is changing the face of the world from year to year. For example, autonomous vehicles are being built and tested today. The discussion is no longer speculative.

2. The growing impact of these advances. We can take just three examples: (1) autonomous machines and weapons, (2) the human-machine interface, and (3) the future of work. While it would be generally agreed that AI is not currently "intelligent" in a human sense, the rapidly expanding capacity of machines, weapons, and algorithms is leaving us behind. While in the past a bridge failure could be attributed to a design or material flaw, technologists can no longer explain exactly how an AI device has come to a conclusion. This means we have to develop new tools to manage the risk of this uncertainty. The development of brain technologies that allow users to control devices simply by thinking, and which may allow machines to reverse this process, shows that the traditional field of medical ethics must now be used to help us in our development of such technologies. While there is furious debate about whether automation will create permanent unemployment for a large part of society, there is no doubt that the rate of displacement of work, including skilled professionals, is dramatic.

3. Expectations of company behaviour. Regulatory focus on poor financial compliance behaviour is now spilling over into the technology field. Over the past decade, total fines and remediation imposed on financial services organizations is approaching $400 billion. Since 2010, the equivalent cost for just two technology failures (BP's Gulf of Mexico spill and VW's emissions concealment) is approaching $60 billion and is expected to rise further. These fines are occurring in many jurisdictions, so can be expected to continue.

Another way to think about technology and ethics, which cuts across the professional and development categories, is between "microethics" and "macroethics." Microethics ad-

dresses the local and immediate, making sure products are safe and reliable, creating a culture of trust in technologists' work, rejecting bribery and corruption, and related areas. Macroethics asks broader questions, such as, what are the risks in developing this technology? This is particularly important in certain fields such as biomedicine and AI.

With these areas of change, now is a good time to re-examine the connection between ethics and technology. Broadly speaking, there are two separate ways that ethics and technology intersect from the perspective of a technologist.

One relates to the behaviour of individual technologists in their professional activity. This is the world of codes of ethics. In October 2016, the White House and New York University's Information Law Institute issued a report from a July 2016 workshop on AI. The report made specific mention of IEEE and other professional organizations working in the AI field, calling on them "to update (or create) professional codes of ethics that better reflect the complexity of deploying AI and automated systems within social and economic domains." IEEE is currently considering how best to respond to this input.

A separate but related aspect of the ethics landscape is the consideration of ethical and societal impacts in the process of developing new technologies. Action here involves technology professionals, but also company policies and culture, government regulation, and the broader community (particularly if a technology becomes unpopular). IEEE has recently increased its engagement in this aspect of the landscape. The launch of the IEEE Global Initiative for Ethical Considerations in Artificial Intelligence and Autonomous Systems (AS) and the subsequent development of the P7000 family of standards (which includes P7001 and P7002) have spearheaded the building of consensus on key facets of the AI/AS conversation. This complements existing content from Technology & Society Magazine and other publications, as well as events and other projects across IEEE. All of these activities contribute to the IEEE TechEthics™ program, a broader effort being launched at IEEE to foster open, broad, and inclusive conversation about ethics in technology.

While ethical behaviour is about doing the right thing, it doesn't follow that the right thing is intuitively obvious. Just as technologists learn to assess risks in their work, they need to learn how to identify ethically challenging circumstances. For students, this is usually already a part of their current curriculum. The growing difficulty of the challenges, however, means that there is a universal need for greater ethics education. While some coursework is currently provided to students, in the typical workplace there is only a weak tradition of in-service ethics training. Such training is important both to reinforce university education, but also because until a technologist enters the workforce it is difficult to gain a practical sense of the ethics challenges one will face. Government workers and technologists in the not-for-profit sector have similar responsibility for their activities and decisions. For entrepreneurs building new companies, managers in medium-size enterprises, and executives in corporations, the responsibility is once again heavier, as a poor ethical "tone at the top" is universally recognized as a leading cause of ethics breakdown. Here responsibility exists in relation to both the product produced and to the training of staff.

As is evident from these examples, IEEE is involved in all aspects of the ethics and technology discussion. We encourage all interested people to get involved. A simple way to start is by contacting us for more information.

References

1. Snow, C. P., The Two Cultures. London: Cambridge University Press,1959.

Greg Adamson *Chair, IEEE Ad Hoc Committee on Ethics Programs, Chair, IEEE Technical Activities Ad Hoc Committee on Design for Ethics, g.adamson@ieee.org*

Greg Adamson is chair of the IEEE Ad Hoc Committee on Ethics Programs and the IEEE Technical Activities Ad Hoc Committee on Design for Ethics. He is past-President of the IEEE Society on Social Implications of Technology, and is active in the IEEE TechEthics™ program. He is also an honorary Associate Professor at the University of Melbourne, and chair of the IEEE conference series on Norbert Wiener in the 21st Century. His research interests include professional ethics frameworks, and Norbert Wiener's contribution to an understanding of technology and society.

Developing an Ethical Technical Standard

by Howard Wolfman

When we think of standards development or use, we tend to picture a group of hardworking individuals huddled around a table or in an on-line meeting, coming up with the best ever, all-inclusive standard.

Oh, if only it were that simple! Experience has shown that this ideal process frequently does not occur. Rather, the following actions by a standards development individual, company, or industry segment are examples of ethical abuses of the standards development process or application.

If we look at the overarching ethical concepts of standards development, we can categorize standards ethics as "good" or "bad". The following table lists good and bad standards ethics, and offers a guideline relative to what behavior constitutes either good or bad standards ethics during the standard development process.

Good standards ethics shall meet all of the listed seven good criteria, or conversely, fail any one of the five bad criteria.

Good and Bad Standards Ethics

Good (Ethical)	Bad (Unethical)
– Ethics decisions made by a standards-writer which further	– Passing a standard that was advantageous to one's company, or
– one's own well-being while serving industry, and	– made one rich at the expense of others, or
– that of his company, and	– detrimental to customers worldwide, or
– also benefit the SDO (Standards Development Organization), and	– confusing to fellow members of the professional community , or
– the electrical and electronics industry, and	– damaging to the reputation of the SDO.
– the customers who uses this standards, and	
– the earth as a whole.	

Some Examples of Standards Abuse

"Packing" the working group or voting pool

I have witnessed standards development meetings in which the operating procedures were incomplete, and because they were incomplete, allowed a company or industry to pack the meeting with colleagues who were not really involved in the development of the standard in question, but attended the meeting for the sole purpose of group voting. What was even more disturbing was the practice of the hiring of "shills" to attend the meeting, who were instructed to watch the way a particular individual voted and always vote the same way.

Falsifying self-certification data

Examples of unethical actions include selection non-representative test samples in order to provide test data for the marketing organization to use in their collateral; or even worse, creating specially made units to use in the self-certification test program.

Submitting "special" non-representative products for standards review

I have seen abuses of creation of special products to be used for standards review. For example, specially made samples that were needed in order to meet a customer's requirements, or two specially made sets of samples made by an engineer – one for safety tests and one for performance tests.

Placing SDO logo on products that have not been submitted for test and review

A major example of standards abuse by an engineer was submitting self-certification of data to a safety organization with the thought that he was too busy to do the testing, but would do the testing later.

"Emissionsgate"

One of the most publicized ethics issues in recent years was the infamous "Emissionsgate," in which a major global automotive manufacturer's engineers programmed engines to activate certain emissions controls only during laboratory emissions testing. This was done with the simple goal of providing better performance on the road. This programming was deployed in about eleven million cars worldwide and resulted in billions of dollars in fines and recalls of these cars.

What Can We Learn From These Examples?

Very simply stated—we should know what is ethical and what is unethical, and have a sense of what is right and what is wrong. Ultimately, we need to practice what is ethical in spite of any pressures to meet deadlines or meet safety, performance, or operational requirements.

Howard Wolfman
Lumispec Consulting, Adjunct Professor University of Illinois at Chicago, h.wolfman@ieee.org

Howard Wolfman received his BSEE from the University of Illinois, MBA from Northwestern University, and is a Registered Professional Engineer in Illinois. After many years of industry experience leading engineering, manufacturing, marketing, and sales functions in diverse product areas, he is now the principal of Lumispec Consulting, specializing in Management and Lighting Energy Efficiency.

Howard has held numerous leadership positions in domestic and international standards and trade organizations including ANSI, IEC, IEEE, NEMA, UL and CSA. He has been a member of the IEEE Standards Board for what seems to be forever – about 12 of the last 15 years. His IEEE activities include past chairman of the Chicago Chapter of the EMC Society, past member of the Board of Governors of the EMC, IAS, and EMS Societies, past chairman of the Chicago Section, past region 4 Director and past IEEE Treasurer.

He is an adjunct full professor in the Master of Engineering Program at the University of Illinois at Chicago, has been a lecturer at universities worldwide, made numerous presentations, and authored many papers. He is a recipient of the IEEE Centennial Medal (1984), the IEEE Third Millennium Medal (2000) and the NEMA Kite and Key Award (2008).

Funny Pages

Shall We Go To Lunch?

by Baloo, Jantoo.com