USNC CURRENT

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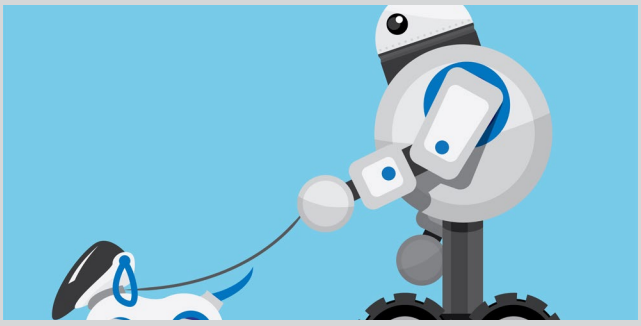
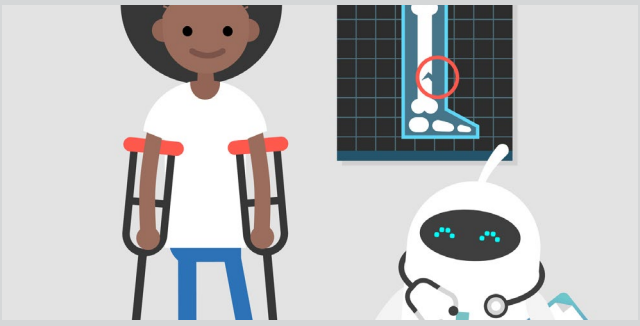
FOCUS ON: ARTIFICIAL INTELLIGENCE

FEATURED STORIES



Artificial Intelligence and Automated Systems



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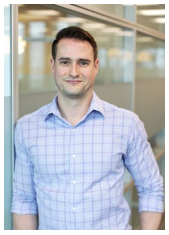
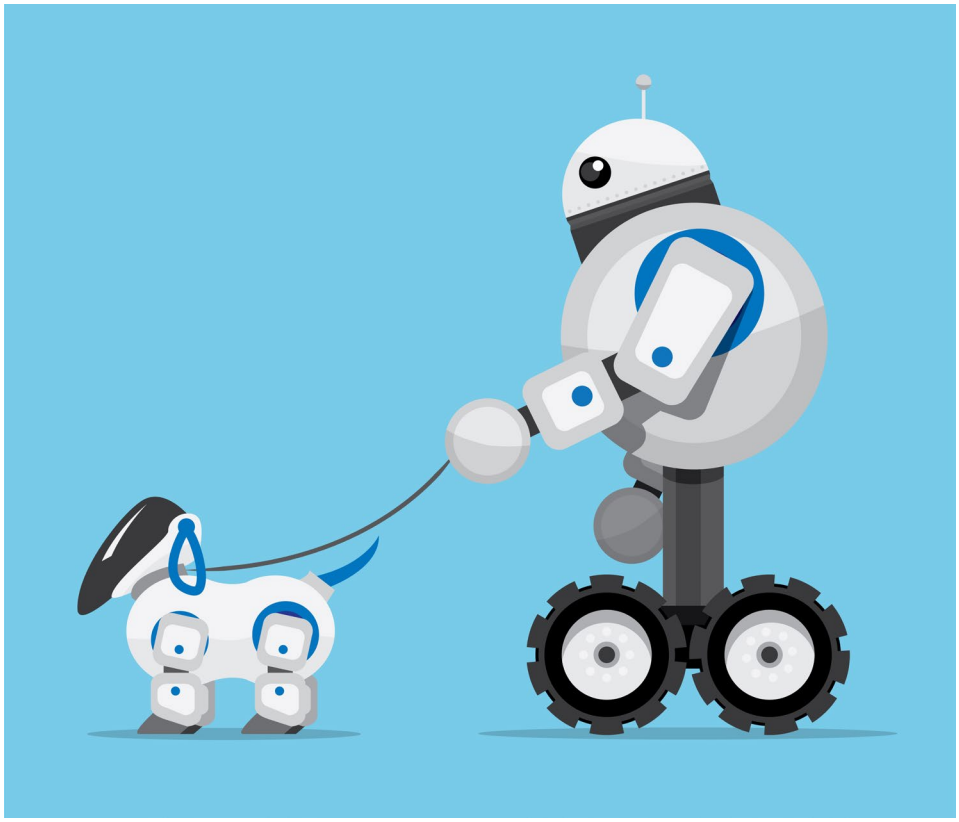
Artificial Intelligence and Automated Systems

By Kyle Crum, Manager, Advanced Technology at Rockwell Automation and Wallie Zoller, Project Leader, Global Products Standards and Regulations at Rockwell Automation





The fast progress of artificial intelligence creates the need to address its impact across entire technological ecosystems. The integration of AI presents opportunities for improvements to automated systems while also presenting a host of challenges and risks. The execution of a cohesive strategy requires consideration of technical applications, the thoughtful development of standards and regulatory frameworks, as well as the examination of possible societal implications.

A Brief History and Introduction to the "State of the Art"

The term Artificial Intelligence (AI)—coined for a Dartmouth College conference in 1956[1]—broadly refers to non-natural systems that display 'creativity' in problem solving. Innovative minds have contemplated such concepts since Homer,[2] but wide-spread practical examples have only become feasible since the electronics revolution sparked by WWII, the genius of Alan Turing,[3] and the subsequent foundational development of computing technologies through the 1950s and 1960s.[4] While the historical context of AI is broad, herein the authors will focus on a modern manifestation composed of the set of supervised, semi-supervised, and unsupervised AI algorithms that learn from training data, ongoing system use, or a combination of both—a sub-class commonly referred to as machine learning.

With the onset of cloud computing, companies promoted the concept of a centralized computer where AI (and other analysis) could be performed on large aggregated datasets to generate insights that are not obvious at lower levels. While largely successful in the information technology space, where round-trip latency on the order of 60 ms to 70 ms is acceptable,[5] many industrial applications within the operational

1 J. Moor, "The Dartmouth College artifical intelligence conference: The next fifty years.," *AI Magazine*, vol. 27, no. 4, pp. 87-91, 2006.

2 B. G. Buchanan, "A (Very) Brief History of Artifical Intelligence," *AI Magazine*, vol. 26, no. 4, pp. 53-60, 26 September 2007.

3 A. M. Turing, "Computing Machinery and Intelligence," *Mind*, vol. 59, pp. 433-460, 1950.

4 G. Dyson, Turing's Catheral: The Origins of the Digial Universe, New York: Pantheon, 2012.

5 Compass datacenters, "Latency, Bandwidth and the New Data Center Network," [Online]. Available: https://www.compassdatacenters.com/wp-content/uploads/2016/04/latency-and-bandwidth.pdf. [Accessed 18 April 2019].

technology space require answers an order-of-magnitude faster. In response to this need, the concept of scalable analytics or "fog computing" was born.[6,7]

Scalable analytics leverages compute surfaces spread throughout the application space. These resources then perform analysis, sending only the necessary results to higher levels for further evaluation and contextualization. The benefits are significant. Lower-level machines have access to high-frequency data that is impractical to send to the cloud, and their proximity mean much lower latency. Their results, however, can be aggregated to the cloud for further analysis and correlation.

Tangible Applications

A scalable analytics model enables analysis to be performed at the appropriate level, while enabling higher-level correlation and trending. For example, suppose a waste-water treatment site was concerned about pressure, blockage, and cavitation in pumps.[8] Low-level analytics surfaces could evaluate frequency and time-domain data at the motor-drive level. These systems can review gigabytes of data via AI looking for suspicious events. The motor-drive level compute systems only need to highlight a problem to higher levels in the system—messages measured in bytes. These events, after transmission to higher levels, can be evaluated for other insights; maybe revealing that there is a correlation with outside temperature or humidity. This architecture leads to much more effective AI system deployment.

Impact to Standards and Regulations

These technological revelations will have a dramatic impact on extant standards and regulations as well as require careful consideration for standards and regulations currently in development. AI-based analytic systems will have applications across myriad technologies and cut across a broad range of topics. It is important to support efforts to develop and maintain a carefully considered and widely applicable framework to ensure that the safety and security of both the system and end users as AI based solutions are integrated into the current landscape. Standards and regulation have proven to be an excellent vehicle for providing guidance and mutual adherence for product development and certification.

Artificial intelligence, machine learning, scalable analytics, and the like provide an enormous opportunity for rapid progress in the speed and efficiency of production and delivery of goods. It is critical to understand the implications this will have on relationships between human and machines, especially as it applies to safety and security. As the deliverable complexity and speed of AI-based systems continue to escalate, the success of the systems will ultimately rest on an architecture that makes appropriate considerations for transparency, traceability, and accountability. That is to say, should an undesirable outcome from self-training or autonomous system emerge, administrators and technology owners will have insight and impetus to address areas of concern.[9]

Ethics/Social Impact

Artificial intelligence and autonomous systems will reshape the socio-economic landscape as we know it. Inscribed in these systems will be ethical principles that guide their behavior and could have wide-reaching implications. Those principles must be rooted in a coordinated discussion which takes broadly accepted social norms and goals into consideration and produces trustworthy results free of bias and harm. Continuous engagement by a multi-stakeholder group including technology experts as well as industry and government consortia will be required to ensure the greatest benefit is derived from the deployment of these systems.

AI is a tool with the potential to improve our collective well-being. The benefits of that potential will only ever be fully realized when people are confident that the technology and systems are designed with consideration to optimal oversight, accountability, and governance.[10]

6 Rockwell Automation, "New Scalable Analytics Capabilities for Industrial IoT Applications," 6 November 2017. [Online]. Available: https://ir.rockwellautomation.com/press-releases/press-releases-details/2017/ New-Scalable-Analytics-Platform-for-Industrial-IoT-Applications/default.aspx. [Accessed 18 April 2019].

7 R. Mahmud, R. Kotagiri and R. Buyya, "Fog computing: A taxonomy, survey and future directions," in *Internet of Everything*. B. G. Buchanan, "A (Very) Brief History of Artifical Intelligence," *AI Magazine*, vol. 26, no. 4, pp. 53-60, 26 September 2007. Springer, 2018, pp. 103-130.

8 Rockwell Automation, "EnWin Utilities Reduces Main Breaks by 21 Percent," [Online]. Available: https://www.rockwellautomation.com/en_NA/news/case-studies/detail.page?pagetitle=EnWin-Utilities-Reduces-Main-Breaks-by-21-Percent-%7C-Case-Study&content_type=casestudy&docid=bf7f04749a0e3440a43184f4ef0784e1. [Accessed 19 April 2019].

9 IEEE, IEEE Global Initiative on Autonomous & Intelligent Systems.

10 E. Commission, "High Level Expert Group on Artificial Intelligence," [Online]. Available: https://ec.europa.eu/digital-single-market/en/high-level-expert-group-artificial-intelligence.

AI in Radiology and Radiation Oncology

By Mahadevappa Mahesh, MS, PhD, FAAPM, FACR. & Geoffrey Ibbott, PhD, FAAPM, FACR.

Artificial intelligence (AI) is often used as an umbrella term to describe a number of activities that can contribute to medicine. In fact, AI is very much related to, but different from machine learning, deep learning, big data, and similar activities. In most areas of medicine, and particularly in radiology and radiation oncology, these techniques are beginning to contribute to computerized decision support, interpretation of images, and automated treatment planning.

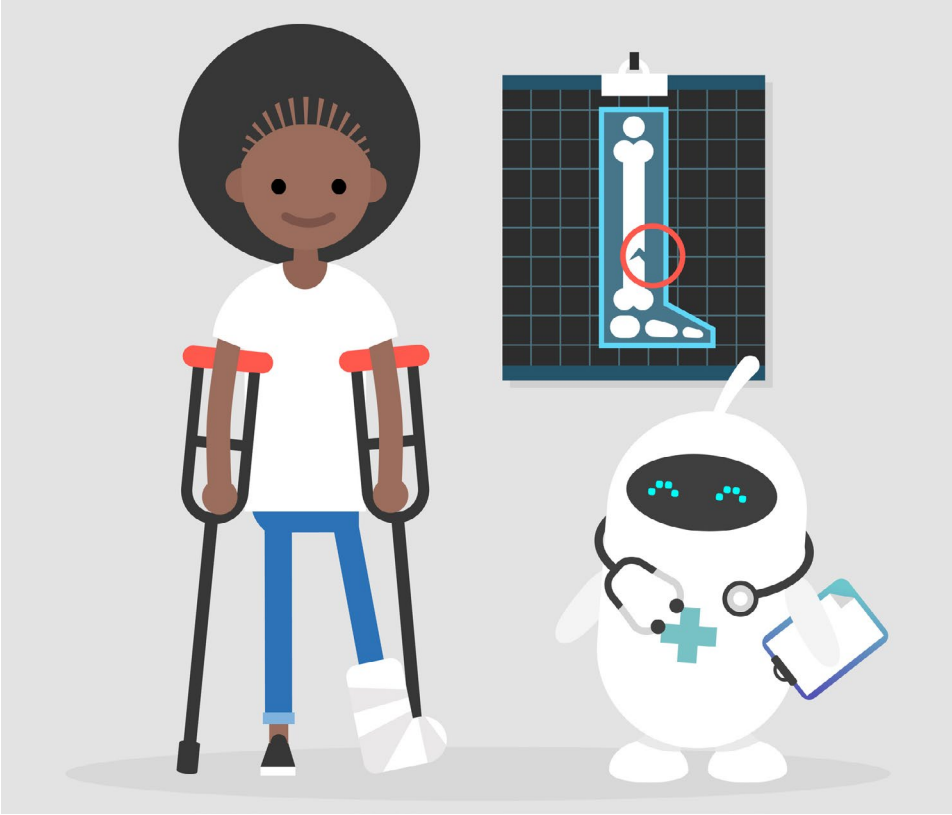
AI in Radiology:

Radiology is very much amidst the AI revolution. Radiologists are cautious this time, since they experienced the "hype-bust" cycle with computer aided diagnosis (CAD) in the past. The primary motivation behind the emergence of AI in radiology this time has been due to the desire for greater efficacy and efficiency in clinical care. As imaging data continues to grow and imaging reimbursements decline, it has forced health-care providers to compensate by increasing productivity. AI tools properly integrated into the workflow would increase efficiency, reduce errors and increase productivity. AI tools are being developed to enhance or complement radiologists in their daily practice. AI algorithms, particularly deep learning, have demonstrated remarkable progress in image-recognition tasks. AI methods excel at automatically recognizing complex patterns in imaging data and providing quantitative, rather than qualitative, assessments of radiographic characteristics.[1]

A few such tools, such as Cardio DL (performs editable ventricle segmentation on cardiac MRI images), OsteoDetect (detects wrist factures in adult patients' x-rays), and a few others are already approved by the US FDA for clinical use.

The American College of Radiology has established the Data Science Institute (**www.acrdsi.org**) to facilitate collaboration between radiology professionals, industry leaders, government agencies, and other stake-holders for the development and implementation of artificial intelligence (AI) applications that will help radiology professionals provide improved medical care.

Some commentators have predicted that AI will end the practice of radiology. They are wrong; in fact, AI methods will be beneficially incorporated into the practice of radiology. AI tools will allow radiologists to be more productive, accurate, consistent and timely in their work. It is evident that the field of AI in radiology is still in its infancy and is unlikely to replace radiologists



1 Hosny A, et al. Artificial Intelligence in Radiology. Nat Rev Cancer. 2018 August; 18(8) 500-510. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6268174/

within the near or even distant future. The roles of radiologists will expand as they become more connected to technology and have access to better tools. They are also likely to emerge as critical elements in the AI training process, contributing knowledge and overseeing efficacy.

AI in Radiation Oncology:

Radiation oncology is on the verge of benefitting from the application of AI techniques also. The availability of inexpensive computer storage and powerful graphics processing units has made the collection of massive amounts of patient data more practical. Unfortunately, the collection of data from the many thousands of patients that is needed for decision support is just beginning. But one day it may be possible for a radiation oncologist to turn to a database of previously-treated patients and a deep-learning algorithm to determine which treatment resulted in the best outcome for patients having the same tumor type, stage, and grade—as well as matching sex, age, smoking history, and genetic makeup—as the patient for whom he or she is considering a course of treatment. Today, advances are being made in automated techniques to recognize and outline (a process called segmentation) the different structures in a patient's body, on the basis of CT scans. The process of segmentation must be performed for each patient receiving radiation therapy, and for tumors in complex body locations such as the head and neck, identifying the extent of each of the many normal, sensitive structures can take hours. It is hoped that machine learning and AI techniques will soon reduce this to an hour or less. At the same time, computer algorithms are being refined that can recognize changes in CT and MR scans and contribute to decision-making regarding a course of therapy or predict the outcome of treatment.

IEC YOUNG PROFESSIONALS, THEN AND NOW

Ethan Biery was selected to represent the United States as a 2013 Young Professional and then as a 2014 YP Leader. As a direct result of that experience, Ethan was offered a position on the USNC Technical Management Committee in 2015, and was one of the founding members of the Young and Emerging Professionals Committee. This later led to his nomination as Vice Chair of the USNC Communications Committee. In 2018, He was also selected to represent the United States at the inaugural Future Leaders Forum, with a focus on influencing development of IEC standards around cybersecurity and the smart grid. At his employer, Lutron Electronics, Ethan's primary tasks now involve training and working with customers and salespeople to overcome technical obstacles, including understanding compliance with various domestic and international energy- and product-related standards. He also works with Lutron's global standards team on a regular basis to provide feedback from customers that can be used to help influence future standards development within the IEC and other standards-writing organizations.

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USNC Recap

IEC Procedures and Processes Training

On April 29, 2019, the USNC co-hosted the IEC Procedures and Processes Course in conjunction with the IEC central office. During the one-day training, Jan-Henrik Tiedemann, Head of IEC Academy & Capacity Building, went over a series of interesting IEC topics including standardization strategy & development process and the IEC Young Professionals Programme. The USNC thanks Jan-Henrik for the time and dedication spent in order to provide the USNC constituency with countless resources and plentiful knowledge.

USNC TAG Leadership Workshop

Following the IEC Procedures and Processes Training, the USNC hosted its biennial USNC TAG Leadership Workshop. This learning opportunity invited all USNC TAG Leaders to participate in an overview of important USNC topics such as US/CENELEC Relations and the Frankfurt Agreement, the USNC TAG Model Operating Procedures, and the Nuts & Bolts of TAG Leadership.

The USNC would like to recognize all the speakers and the USNC TAG Leadership Workshop Task Force::

- Muhammad Ali, NEMA
- Sonya Bird, UL
- Hae Choe, AAMI
- Valara Davis, UL
- Elaina Finger, Corning Incorporated
- Robert Friedman, Siemens
- Patricia Griffin, ANSI
- Bob Kretschmann, Rockwell Automation
- Bill Lawrence, FM Approvals
- Kevin Lippert, Eaton Corporation
- Jim Matthews, Corning Incorporated
- Joe Musso, UL
- Debra Negron-Badillo, USNC
- Grace Roh, UL
- Steve Swanson, Corning Incorporated

IEC National Committee Secretaries Mid-Year Forum

During the week of May 13, 2019 the US National Committee to the IEC hosted the National Secretaries Forum with over two dozen national committees converging at the New York ANSI office. A series of productive meetings and thoughtful discussion were had about issues the international community is addressing with an eye to the future opportunities and challenges facing the IEC. Some

IEC National Committee Secretaries Mid-Year Forum

of the topics discussed by the Forum included:

- Recruitment of the future General Secretary & CEO
- Who should attend NC Secretary Forums?
- Dealing with IT systems/issues and digital tools
- Recruitment and retention of new members and experts
- Strategic and operational challenges faced by NCs.
- Best practices from around the world
- Young Professionals and succession planning
- Geographical balance and diversity—what does diversity mean for IEC?
- Draft IEC Sales Policy and draft IEC IP Policy documents
- Online authoring of standards
- IEC Masterplan implementation: overview of deliverables, assignments and future steps

In addition, guest speaker, Dr. Richard Galvez, led a fascinating discussion about artificial intelligence and standardization, as well as the value of innovation in all of the IEC's work.

Following the successful meeting, a reception was held with all in attendance. The United Kingdom offered to host the next IEC National Secretaries Forum in London next year.

Register Now to Attend ANSI Company Member Forum, June 24–25, 2019

The **American National Standards Institute (ANSI)** invites members to register for the 2019 ANSI Company Member Forum (CMF), which will be held in Santa Clara, CA at the offices of Qualcomm. This year's topics are relevant to companies across all sectors of the economy, including digital transformation, sustainability, the circular economy, the effects of standards on 5G, and updates on the latest discussions about China's standardization reform.

A final agenda will be available in the next few weeks.

Participation in ANSI's CMF offers many benefits:

- Data, information, and best practices—garnered from the discussion topics and invited experts;
- Opportunities to collaborate with colleagues to identify industry-wide challenges faced by many other CMF members, and learn and share new approaches that effectively address these issues;
- A place to network and build productive and meaningful relationships with industry peers in the standardization community.

The CMF begins on June 24 with a session that will run from 12:00 p.m. until 5:00 p.m. followed by a networking reception. On June 25, the CMF resumes with sessions that will run from 8:00 a.m. until 5:00 p.m.

Registration is open until June 14, 2019. More information is available **here**.

About the CMF

The CMF serves as a venue for ANSI members representing the full spectrum of U.S. industry to examine issues related to national and global standards, as well as conformity assessment developments. The forum allows industry members an opportunity to collectively shape and influence U.S. policy in the domestic and international arena, while bolstering cross-networking and alliances.

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LinkedIn

Would you like to stay updated with the news and events of the USNC? **Join our LinkedIn Group** to keep updated on and provide input on all issues electrotechnical that can affect your life from your own home to the other side of the globe! If you have any information to share on the LinkedIn, please contact Kristen Palma (**kpalma@ansi.org**).

Update on Artificial Intelligence from the National Institute of Standards and Technology (NIST)

On February 11, 2019, the Executive Order on **Maintaining American Leadership in Artificial Intelligence (AI)** directed the National Institute of Standards and Technology (NIST) to create a plan for Federal engagement in the development of technical standards and related tools in support of reliable, robust, and trustworthy systems that use AI technologies (Plan). In developing this Plan, NIST is engaging with Federal agencies, the private sector, academia, non-governmental entities, and other stakeholders with interest in and expertise relating to AI.

This plan seeks to help understand the current state, plans, challenges, and opportunities regarding the development and availability of AI technical standards and related tools, as well as priority areas for Federal involvement in AI standards-related activities.

NIST's Request for Information about federal government engagement in AI standards was published in the Federal Register Notice on May 1, 2019. See **https://www.nist.gov/topics/artificial-intelligence/request-information-about-federal-engagement-artificial-intelligence** for the RFI and related information.

More information and updates about the NIST tasking under the EO is posted, **https://www.nist.gov/topics/artificial-intelligence/ai-standards**.

HONORARY LIFE MEMBERSHIP AND RETIREMENT

In May 2019 the USNC awarded Mr. Kenneth Gettman and Mr. Mark Earley with Honorary Life Membership. Mr. Gettman and Mr. Earley have been institutions in the USNC for over two decades and their presence will be missed. Mr. Gettman served as Secretary for 14 USNC Technical Advisory Groups and as international Secretary of IEC/SC 22G – Adjustable Speed Electric Drive Systems. He also served as Technical Advisor for 8 TAGs and as Deputy TA for 10. Mr. Earley worked primarily in TC 64, was awarded by numerous industry associations, and wrote a bestselling book on international standards. Let us all congratulate them on a happy retirement!

IEC SIGNS SDG 5 GENDER EQUALITY – GENDER RESPONSIVE STANDARDS DECLARATION

In line with the UN Sustainable Development Goals (SDGs), in 2016, UNECE WP 6 created the "Gender Responsive Standards Initiative" with the aim of improving gender balance in standards development, and ensuring that the content and impact of standards when implemented are gender-responsive. In coordination with international, regional and national standardization organizations a proposal was made and WP6 has adopted the Gender Responsive Standards Initiative during its meeting held on November 14–16, 2018.

The **Declaration** was officially opened for signature on May 14, 2019.

The IEC has signed this declaration, as well as ITU and ISO.

Selected Excerpts from IEC's White Paper "Artificial Intelligence across Industries"

Great Opportunities Come with Risks and Challenges

AI represents a huge market potential. According to a recent study from the International Data Corporation (IDC), worldwide spending on cognitive and AI systems is forecast to exceed USD 57 billion in 2021.[1] The retail and banking sectors are expected to spend the most on AI in the coming years, followed by discrete manufacturing, healthcare and process automation. These five industries, still according to IDC, will continue to be the largest consumers of AI technology, with their combined investments representing nearly 55% of all worldwide spending on such technology by 2021.

Taking into account the related service industry of machine intelligence, which includes programme management, education, training, hardware installation, system integration and consulting, the market size is actually much larger and AI is foreseen to become one of the fastest-growing industries in the near future. While automated customer service and diagnostic systems will likely remain the top drivers of AI spending in the coming years, smart manufacturing is expected to take a strong position in the AI market. IDC actually sees intelligent process automation become the third largest use case of AI systems by 2021.[1] Other use cases that will experience fast spending growth include public safety, emergency response, and shopping advisors and recommendations.

Inevitably these exciting market prospects will also carry a certain number of risks and challenges. The impact of AI on the workforce is frequently cited as a potential threat to societies, with tensions in social relations resulting from a gradual diversification of the employment market. Increased automation and connectivity could also lead to additional or intensified wealth gaps between developed and developing economies. However uncertain such scenarios appear today, all major economies throughout the world have started to invest heavily to support AI innovations as part of their strategic technology planning activities. For instance, in 2017 China promulgated the "New Generation of AI Development Plan," the "Three Year Action Plan for the Promotion of New Generation of AI Industry (2018-2020)" as well as various other policies to accelerate research, development and industrialization of AI technology.

Need for Artificial Intelligence

Today's society and business landscape are characterized by a complex and unprecedented set of challenges and opportunities. Existing markets are subject to disruption and can even disappear abruptly in a short space of time. Major global trends impacting society, the economy, business, cultures and personal lives, often called megatrends, are defining the future world of mankind and its increasing pace of change.

Megatrends represent interconnected, global interactions that contribute to framing the impact of major technology developments such as AI. The joint effect of digitization, automation and AI is expected to significantly impact the future of work. It is anticipated that computerization will affect many low-skill jobs, with computer-guided automation becoming increasingly prevalent across numerous industries and environments, including manufacturing, planning and decision-making.[2] The growth in technological capabilities is already transforming supply chains, reshaping the workforce and redefining jobs. The challenging prospect of such change lies in the fact that the growth is not linear but rather complex and accelerating.

At the same time, AI will enable and improve a wide range of applications that can address some of the challenges emerging from these megatrends: environmental concerns,

1 IDC Spending Guide Forecasts Worldwide Spending on Cognitive and Artificial Intelligence Systems to Reach $57.6 Billion in 2021 [Online]. Available: go.iec.ch/wpai001. [Accessed: 14 September 2018].

2 HAJKOWICZ, S. A., REESON, A., RUDD, L., BRATANOVA, A., HODGERS, L., MASON, C., BOUGHEN, N., Tomorrow's Digitally Enabled Workforce: Megatrends and scenarios for jobs and employment in Australia over the coming twenty years, CSIRO, Brisbane, 2016.

changing demographics, or economic disparity, to mention only a few.

Scarcity of Natural Resources

The planet's natural resources are being consumed at an alarming rate and most countries are expected to double their annual global consumption of such resources by 2050.[3] Not only are finite natural resources being depleted, humans are also using far more environmental resources than Nature can regenerate. While in the past resource conservation was often viewed as detrimental to business, today the two are by no means mutually exclusive.

AI is already helping countless manufacturers to optimize productions processes, thereby reducing waste and increasing output. In addition, AI will soon be used not just to optimize the processes themselves but also their inputs. By analyzing the purpose, properties and environmental impact of a production's input materials, AI will be able to help scientists design materials that match the specifications required for more sustainable production. Ideas have even been proposed for using AI to identify a second usage for the material components of by-products created by machinery, thereby creating a near circular use of raw materials. Not only are such efficiency gains in production processes an attractive incentive for businesses, they will also have a significant impact on global resource consumption.

AI will also help utilities in an era of increasing urbanization, growing power consumption, scarcity of water resources, and large-scale deployment of renewable energy. This will be achieved by more intelligent management of both demand and supply. On the demand side, AI is already producing significant energy savings, for example by reducing the consumption of data centres by 15%. On the supply side, decentralized smart energy grids will be able to predict and pre-empt outages, and manage fluctuations in supply and demand to ensure the optimal level of supply while at the same time minimizing the use of fossil fuels.[4] Additional examples include the optimization of renewable energy generation through solar or wind farms or the optimization of vehicle traffic flows to reduce emissions.

Climate Change

Forecasts by leading scientists have been unequivocal: without a consistent response to the climate change challenge and a more responsible use of environmental resources, unpredictable changes will threaten the planet. This raises the question of how to reconcile economic objectives with environmental sustainability. Equally important is how mankind can prepare for unexpected dramatic natural occurrences in the future.

The use of AI in a wide variety of applications is expected to play a leading role in the fight against climate change. AI can support complex decision-making processes when dealing with natural resources or when predicting unexpected incidents. The consumption and use of resources, for instance, can already be optimally coordinated during energy generation. AI makes it possible to set numerous parameters such as context-based electricity consumption and grid load in relation to weather forecasts and electricity tariffs. As a result, the behaviour of electricity consumers can be determined and addressed more efficiently.

Building on those achievements, intelligent mobility solutions involving a more responsible use of resources can be implemented, including autonomous electromobility. Not only can vehicles and trucks be optimally and efficiently matched to one another, they can also be driven more efficiently thanks to AI.

Similar developments can be devised for efficient water consumption. In agriculture, for example, AI allows to determine the optimal water demand depending on the specific needs of each individual plant, the soil situation and current weather conditions. Furthermore, supply strategies for droughts and water shortages in affected regions and countries can be developed using AI techniques.

AI can also contribute to improving predictions of weather scenarios and natural disasters. Scientists are increasingly faced with the challenge of capturing and processing numerous influencing factors in order to increase the accuracy of weather forecasts. AI will effectively help people process a wide range of measurement data in order to provide early predictions for weather-related events and warnings of potential elements such as floods, air pollution episodes, or storms. Early-warning systems can then be set up more intelligently for diverse geographies.

If you would like more information on this whitepaper, ***please click here****.*

3 United Nations Environment Programme, With resource use expected to double by 2050, better natural resource use essential for a pollution-free planet [Online]. Available: go.iec.ch/wpai004. [Accessed: 14 September 2018].

4 WOLFE, F., How Artificial Intelligence Will Revolutionize the Energy Industry [Online]. Available: go.iec.ch/wpai005. [Accessed: 14 September 2018].

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UPCOMING EVENTS

June 16–17	SMB/CAG Meeting Geneva, Switzerland
June 17–18	CAB/CAG Meeting Geneva, Switzerland
June 18	IEC/SMB and ISO/TMB Joint Meeting Geneva, Switzerland
June 19	IEC Council Board Meeting Geneva, Switzerland
September 17–19	CAPCC/TMC/Council AAMI, Arlington, VA
September 25–27	IECEx MC Dubai, UAE
September 25–27	FINCA Lima, Peru (Canadian NC to host)
October 21–25	83rd IEC General Meeting Shanghai, China
November 4–8	World Standards Week Washington, DC
November 19–20	IECRE MC Feldkirch, Austria
October 2020 5-9	84th IEC General Meeting Stockholm, Sweden
2021	85th IEC General Meeting Dubai, UAE
2022	86th IEC General Meeting San Francisco, USA
2023	87th IEC General Meeting Egypt

Save the date!

IEC 2022 General Meeting, Host City: San Francisco

Sponsor the IEC 2022 General Meeting, hosted by the USNC

For only the seventh time since 1904, the United States is gearing up to host the IEC General Meeting, 31 October – 4 November, 2022, in San Francisco. Organizations with a stake in all areas of electrotechnology are invited to demonstrate their commitment to international standardization and conformity assessment through sponsorship of the 10-day event.

For more information, see the **IEC 2022 Sponsorship Brochure** or contact Tony Zertuche at: **tzertuche@ansi.org** or 212-642-4965.

Thank you to the organizations already on board as IEC 2022 sponsors!

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ABOUT THIS PUBLICATION

The USNC Current newsletter is distributed to the constituency of the U.S. National Committee (USNC) of the International Electrotechnical Commission (IEC). It provides updates on technical activities and other information of interest to members of the electrotechnical community. Some articles are reprinted with permission from the IEC News log.

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