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# IEEE Future Directions Newsletter



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## What's Happening in IEEE Future Directions?

During the June 2018 IEEE TAB Meeting Series, **Roberto Saracco**, Chair - Industry Advisory Board, (a committee comprised of industry executive leaders reporting to the Future Directions Committee), presented a thought-provoking discussion on future industry trends and the associated big engineering challenges, including green engineering end to end, rethinking cities, addressing climate change, increasing agriculture yield, and many more. View his presentation at [this link](#), and keep up with technology trends through [Roberto's daily blog](#).

To address some of these engineering challenges and future technology trends, IEEE Future Directions (FD) has implemented a **three-pronged model for funding opportunities** within FD. To this end, FD seeks to identify, develop and promote projects that are value-added for IEEE and its members, bringing together multiple societies and councils to provide broad and deep perspective on a particular topic or technology. These projects range from short-term activities to reach a specific goal to three-year initiatives aiming to engage cross-collaboration among industry, academia, and government striving to develop and deploy various future technologies. Three types of **project models** have been identified with the following goals:

1. **Incubator:** Encourage quick small scale out-of-the-box projects with an identified end goal.
2. **Small project:** Assess value and community support for pursuing activities in a specific arena.
3. **Full initiative:** Support development of a new technology or application that will provide value to new and existing IEEE members, attract new IEEE members, and generate revenue through cross-IEEE activities.

[Read more.](#)



One of the many technology trends highlighted in Roberto's presentation included the future of virtual and augmented reality (AR/VR). IEEE Future Directions is excited to

## IEEE Future Directions Communities



announce the rebranding of the former IEEE Digital Senses initiative to the new **IEEE Digital Reality** initiative which seeks to be the go-to platform for IEEE members on the forefront of virtual reality, augmented reality, human augmentation, and smart robots. IEEE Digital Reality had as strong presence at the recent 2018 Augmented World Expo, as explained in [The Augmented World Expo: Go XR or Become Extinct](#), I-Connect007, 13 June 2018.

IEEE Future Directions is proud to be a sponsor of [COMPSAC 2018: The 42nd IEEE International Conference on Computers, Software & Applications](#), Tokyo, Japan 23-27 July 2018 where various FD initiatives, including Brain, Digital Reality, Rebooting Computing, and SAS, collaborated and contributed to the rich program themed "Staying Smarter in a Smartening World." A hackathon took place, "[24 hours on Data Mashup for Big Data Analytics in a Smartening World](#)," supported by IEEE Big Data, Brain, and IEEE-SA. Additionally, a preview of the 2018 Technology Time Machine Symposium was offered through the panel "[The New Realities of AI](#)."

Finally, to further the direction and development of these future technologies, IEEE President Jim Jefferies announced the creation of an ad hoc committee to support new and existing IEEE roadmaps at the June TAB meeting. The **IEEE Roadmaps Strategy and Governance (IRSG) Ad Hoc Committee** is tasked with setting up the infrastructure to aid roadmap activities at IEEE including the policies, procedures and guidelines, and potentially establishing improved roadmap distribution and collaboration within IEEE and beyond. The committee will be chaired by Rakesh Kumar, IEEE Life Fellow and will report to TAB Vice President, Kathy Land. For more information on the activities of IRSG, please contact [ieee-roadmaps@ieee.org](mailto:ieee-roadmaps@ieee.org).

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## IEEE Future Directions Technology Time Machine 2018 (TTM 2018)

**Registration is now open!** Join us for the [2018 TTM Symposium](#) on 31 October - 1 November 2018 at the Hilton San Diego Resort & Spa in San Diego, CA. The IEEE Technology Time Machine is the IEEE's flagship conference on future technology directions. Hear a sneak peak from Keynote Speaker **Poppy Crum, Chief Scientist at Dolby Laboratories**, in her recent TED talk, "[Technology that knows what you're feeling](#)" where she studies how we express emotions and suggests that the end of the poker face is near as new technology makes it easy to see the signals that give away how we're feeling.

The dynamic speakers of TTM 2018 will provide insights on neuroscience and brain technologies, agricultural technologies and food systems, mixed reality, far future technologies (20-50 years+) and more. The speakers represent both large companies, such as AT&T, J&J, IBM, and more, and small start-ups including Meta, AgShift, Tracy, and others. Experience the future and network with brilliant minds at [TTM 2018](#).



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## Technology Policy and Ethics

Future Directions considers the reflection of technology through the lens of social implications a key tenet of our work as we incubate and promote technologies. We are seeking submissions of original content, short articles of 800-1200 words on the social implications of technology, including but not limited to policy and ethics topics. If interested please email [FDPolicyEthics@ieee.org](mailto:FDPolicyEthics@ieee.org).



## **Don't Take the Bait! Protect Yourself from the Latest Email Scams**

by Sabrina Davis and Junaid Chaudhry

Cyber security - it is commonly thought of as a world of virtual threats made by seemingly virtual people. But cyber security is instituted to in fact, help us secure our computer's software. Cyber is compelled by human emotion and thought, as underneath every falsified email or server attack, there is a person hitting the "go" button to send it off. This means any threat can be stopped by the same human knowledge that is able to launch it. The link between cyber and psychology is fundamental in understanding threats such as phishing, spear phishing, and whaling.

[Read More](#)

## **The Role of Education and Information Technology for a Fair and Sustainable Development**

by Marco Pellegrini and Massimo Mozzon

The world's population peaked to 7.6 billion by mid-2017, approximately adding a billion inhabitants since 2005. The Population Division at the Department of Economic and Social Affairs (DESA) United Nations (UN), predicts that global population will increase by 1.1% each year reaching 11.2 billion by 2100. Sixty per cent of the world's people live in Asia and 17% in Africa, while the remaining 23% live across Europe, America and Oceania. China and India are the two most populous countries of the world comprising 19% and 18% of global total, respectively. Based on UN/DESA projected growth of global population until 2100, it is estimated that Asia and Africa will still remain the two most populous regions of the world, comprising about 83% of global population. Therefore, the majority population growth is expected to take place in developing and least developed countries (LDCs).

[Read More](#)

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## **Current Activities in our Technical Communities**

### **[IEEE Big Data:](#)**

IEEE Big Data Technical Community, IEEE Brain, and IEEE Standards Association hosted a hackathon at [COMPSAC 2018](#) titled "[IEEE Hackathon on Big Data Governance and Metadata and Management](#)" with the goal to address the Big Data variety challenges in a smartening world by enabling data integration/mashup among heterogeneous datasets from diversified domain repositories and making data discoverable, accessible, and re-usable through a machine readable and actionable standard data infrastructure.

### **[IEEE Blockchain:](#)**

The inaugural edition of the *IEEE Blockchain Newsletter* is now available. This newsletter features a collection of short, timely technical articles that inform, explore, and advance blockchain and related technologies. We are always seeking succinct articles written at the architectural level. The deadline to submit an article for our next issue is 6 August 2018. [Read more.](#)

### **[IEEE Brain:](#)**

#### **Submission Open for One-Page Papers to IEEE Brain Initiative Workshop**

The [2018 IEEE Brain Initiative Workshop on Advanced NeuroTechnologies](#), to be held in San Diego 1-2 November, is accepting one-page papers on brain-related topics. Accepted papers will be presented during the poster session on 1 November.

Submission will close 15 August 2018 and accepted authors will be notified 1 September. [Read more.](#)

### **Requesting your Comments on Position Paper for Future Effective Human-Intelligent Teaming.**

[IEEE Brain-storming](#) is a new interactive feature on the IEEE Brain website that offers the opportunity for the community to engage in an open dialogue on future technological visions. The first position paper authored by the Army Research Laboratory has been published, and we are requesting your comments on the scientific and engineering approaches for future effective human-intelligent agent teaming. Polling questions are embedded throughout the position paper as well as comments blocks for more substantial dialogue. [Read more.](#)

### **IEEE Cloud Computing:**

Call for Book Chapters: We are seeking authors for book chapters on [Artificial Intelligence in the Cloud: Architecture, Services, and Operation](#). The industry has been circulating names like Intelligent Cloud, Intelligent Edge and variations of them. The basic premise behind these names is that the cloud or edge will have enhanced capabilities through AI, which will allow users to do more than just computation. Our book is intended to help practitioners establish a full understanding of how/where/when AI plays a role in cloud; and help researchers understand what the main challenges for bringing AI to the Cloud - research challenges, integration challenges, etc. are. [Learn more.](#)

### **IEEE Cybersecurity:**

For our upcoming IEEE SecDev conference, we are seeking practitioners' [session abstracts](#), up to one page. The abstracts will be lightly reviewed. We strongly encourage practitioners from the industry and government to submit and share their security experiences and insights, challenges and obstacles encountered. Authors of accepted abstracts will be invited to give a short talk during the practitioners sessions at the conference. The abstracts will be included in the conference's IEEE proceedings. The abstracts need to show authors' names and affiliations. At least one co-author needs to be from the industry or government, i.e., abstracts with all university authors are not qualified for the Practitioners' Session. The presentation will be approximately 10 minutes. In addition, accepted abstracts will also be invited to present as posters at the Poster Session on the first day of the conference. Abstracts need to use the two-column [IEEE Proceedings style](#). [Submit your papers and abstracts.](#)

### **IEEE Digital Reality:**

The IEEE Digital Reality Initiative hosted [Immersive Experiences, Applications, and Non-Technical Impacts](#), a panel of experts on the world of VR, AR, and XR at the Augmented World Expo, Santa Clara, CA, USA. Subject matter experts from a diverse range of areas spoke of the blend of virtual reality, augmented reality, mixed reality, immersive and other future reality spaces while addressing social, ethical, legal and policy impacts and implications to humans.

### **IEEE 5G:**

The IEEE 5G Initiative recently held a 5G and Beyond Roadmap Workshop on 23-24 May 2018 in Kansas City, MO, USA in an effort to continue development of the IEEE 5G and Beyond Roadmap. Some topics addressed included: top 5 needs, challenges, and solutions; future networks and the gaps in technologies and needed standards; and key messages from nine different technically-based working groups. We are looking for industry participants to help drive the roadmap development. [Learn more here.](#)

### **IEEE Green ICT:**

The Green ICT initiative has renamed itself the Sustainable ICT initiative, to better align itself with terminology used by participants in this area. The initiative seeks to foster the incorporation of sustainable metrics and standards in design concepts for various technical domains. More information about the initiative and its activities can be found at its [website](#).

#### **[IEEE Internet of Things:](#)**

The [5th IEEE World Forum on the Internet of Things \(WF-IoT 2019\)](#) in Limerick, Ireland, 15-18 April 2019, seeks original technical paper submissions on IoT technologies and applications. In addition, the first edition of the [IEEE IoT Magazine](#) is coming in September and is currently soliciting articles.

#### **[IEEE Life Sciences:](#)**

The [IEEE Life Sciences Conference](#), Montreal, Quebec, Canada, 28-30 Oct 2018, will include tutorials and a scientific program composed of plenary talks, invited sessions, lecture and poster presentations of peer-reviewed papers. In addition, there will be a host of special events, including an IEEE Women in Engineering event, a graduate students' competition (Best paper contest), and other initiatives to be announced shortly.

#### **[IEEE Rebooting Computing:](#)**

##### **Artificial Intelligence and Machine Learning Applied to Cybersecurity**

The 2017 edition of the International Roadmap for Devices and Systems (IRDS), building upon 15 years of projecting technology needs for evolving the semiconductor and computer industries, is available for download. [IRDS roadmap reports](#) are freely available for download. Join the IRDS team for further discussion at the Fall IRDS Conference - in partnership with the 2018 IEEE International Conference on Rebooting Computing (ICRC) and as part of the 2018 [IEEE Rebooting Computing Week](#) - scheduled for 5-6 November 2018 in Tysons, Virginia.

The 4th Low Power Image Recognition Challenge (LPIRC) was held last month in Salt Lake City, Utah, USA. This challenge, sponsored by IEEE Rebooting Computing, Google, and Facebook, aimed to discover the best technology in both image recognition and energy conservation. See the winners of the challenge [here](#), and be sure to join IEEE Rebooting Computing at our next series of events, [Rebooting Computing Week](#), 5-9 November 2018 in Tysons, VA, USA, where we will explore the future of computing.

#### **[IEEE Smart Cities:](#)**

*IEEE Smart Cities Newsletter* released - Check out the [July issue](#) to read articles concerning Enabling Technologies and Methodologies for Data Analytics and Knowledge Discovery for Smart Cities! Articles include:

- [Smart City From Concept to Reality: Novel Applications in China](#)
- [Smart Energy Community - The Key of Smart Cities](#)
- [Enabling Technologies and Methodologies for Data Analytics and Knowledge Discovery for Smart Cities](#)
- [Software-Defined Web-of-Nest: A Fully Distributed Framework for Managing Power Distribution Networks](#)
- [Renewable Energy Scheduling and Control Systems - Applications towards Smart Cities](#)

More info available on the recently revamped [IEEE Smart Cities web portal](#).

#### **[IEEE Smart Grid:](#)**

Check out the upcoming tutorial: [IEEE 2030.5 Revision Review & the GREAT-DR Use Case](#).

### **[IEEE Software Defined Networks:](#)**

The SDN initiative hosted the fourth IEEE Conference on Network Softwarization from 25-29 June in Montreal. Held under the theme of "achieving smart network softwarization," the conference saw nearly 200 attendees enjoy four keynote talks delivered by world-class researchers and practitioners, a distinguished experts panel discussion, 10 paper presentation sessions, and 3 demo sessions showcasing prototypes and proof-of-concept implementations of ongoing research. Watch for next year's edition, scheduled for 24-28 June in Paris; more information at [netsoft2019.ieee-netsoft.org](http://netsoft2019.ieee-netsoft.org).

### **[IEEE Symbiotic Autonomous Systems \(SAS\):](#)**

The [SaS eBook](#) is now available. The eBook collects posts that have been published since 2016 on the FDC blog touching upon the broad area of symbiotic autonomous systems from technology enablers evolution to personal and social impacts.

### **[IEEE Transportation Electrification:](#)**

Check out the IEEE Transportation Electrification Community's [website](#) for latest webinars.

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## **IEEE Future Directions Events and Activities**

[2018 IEEE Global Blockchain Summit @ NIST](#), 17-19 September 2018, Gaithersburg, MD, USA

[2018 IEEE Cybersecurity Development \(SecDev\)](#), 30 September-2 October 2018, Cambridge, MA, USA

[IEEE Symbiotic Autonomous Systems: Fostering Technology, Ethics, Public Policy, and Societal Enablers](#), 9 October 2018, Miyazaki, Japan

[IEEE Future Directions Technology Time Machine 2018](#), 31 October-1 November 2018, San Diego, CA, USA

[IEEE International Workshop on Symbiotic Autonomous Systems](#), Co-located with IEEE Technology Time Machine (TTM 2018), 31 October-1 November 2018, San Diego, CA, USA

[IEEE Brain Initiative Workshop on Advanced Neurotechnologies](#), 1-2 November, San Diego, CA, USA

[IEEE Rebooting Computing Week](#), 5-9 November 2018, Washington, DC, USA

[IEEE International Forum on Smart Grids for Smart Cities \(SG4SC\)](#), 26-28 November 2018, Genk, Belgium

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### **Subscribe to this Newsletter or Join one of the Technical Communities**

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445 Hoes Lane  
Piscataway, NJ 08854 USA  
+1 800 678 4333 (toll free, US & Canada)  
+1 732 981 0060 (Worldwide)

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