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IEEE Future Directions Newsletter

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Message from the Future Directions Committee (FDC) Chair

Happy New Year from the IEEE Future Directions Committee! 2018 was an exciting and productive year for our initiatives, as evidenced by some of the accomplishments across the organization:

- The IEEE Blockchain Initiative was launched in early 2018.
- The IEEE Brain Initiative organized a series of hackathons throughout 2018 engaging engineers in locations around the globe.
- The IEEE Digital Reality Initiative coordinated a panel at the 2018 9th Augmented World Expo.
- The IEEE Future Networks Initiative held the IEEE 1st 5G World Forum in July in Santa Clara, CA, USA with participants from around the world.
- The IEEE Rebooting Computing Initiative hosted the 3rd IEEE International Conference on Rebooting Computing (ICRC) during IEEE Rebooting Computing Week in November in Washington, DC, USA.
- The IEEE Symbiotic Autonomous Systems (SAS) Initiative released a second IEEE SAS White Paper.
- The IEEE Technology Time Machine (TTM) 2018 occurred in October in San Diego, CA, USA, bringing together experts from industry and academia to discuss the future of technology.

Building on the foundation from our successful 2018, we look to continue our work in IEEE Future Directions for 2019.

Here are a few upcoming activities in which we welcome your participation:

- The **IEEE Roadmaps Strategy and Governance (IRSG)** ad hoc committee will continue in its mission to support new and existing IEEE roadmaps. Tasked with creating the infrastructure to aid in the development and distribution of roadmaps, IRSG has produced first drafts of several tools, including a roadmaps template and operations manual. For further information, visit the IEEE Roadmaps Strategy and Governance webpage or contact ieee-roadmaps@ieee.org.

IEEE Future Directions Communities

- Mark your calendars for the **2019 IEEE 2nd 5G World Forum** being held 30 September - 2 October 2019 in Dresden, Germany. Following the success of the first IEEE 5G World Forum, this event aims to bring experts from industry, academia, and research to exchange their vision as well as their achieved advances towards 5G and encourage innovative cross-domain studies, research, early deployment, and large-scale pilot showcases that address the challenges of 5G. The call for papers, vertical and topical area proposals, and more is now open at the [website](#).

- In 2019, the **IEEE Rebooting Computing Initiative** will work towards completing its life cycle and will reach maturity as a Future Directions Initiative. It seeks to continue its mission of advancing the next era of computing as it transitions to a developed community within IEEE.

- IEEE Future Directions is introducing a new initiative, **IEEE Quantum**. This initiative, expanding upon the work started at last year's successful Quantum Computing Summit, will address the development and challenges of quantum technologies. For an in-depth look at these technologies and findings from the summit, access the [white paper](#).

- Our **educational offerings** saw tremendous growth in 2018 and will continue throughout this new year. IEEE Future Directions offers a diverse monthly webinar series that attracts over 180 registrants on average with more popular webinars reaching registration numbers well over 300. Also, through our volunteers' efforts, we have been able to host numerous in-person events from tutorials to workshops around the world and have paid special attention to both high-school students and young professionals through creative hackathons and summer schools. In addition to our current offerings, our plans for education continue to grow into 2019, with work on a new Brain Initiative webinar series underway and several in-depth online e-learning courses scheduled for launch in 2019 in multiple initiatives.

Continue to stay informed and current by reading the various **Future Directions Initiative newsletters**, online publications of short technical articles delivered to your email address. Newsletters are available for the [Brain](#), [Blockchain](#), and [Future Networks](#) initiatives. Please consider authoring an article regarding innovative and impactful discoveries or developments in these areas; author guidelines are available on each of the initiative portals.

As we look forward to the many activities occurring in 2019, there are plenty of opportunities for involvement in IEEE Future Directions; join one or all of the [technical communities](#) to stay informed and determine the best place for you to participate.

Steve Diamond, IEEE Future Directions Committee (FDC) Chair

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. During 2018 we released six issues encompassing 10 articles covering topics including traffic management, deep learning, big data, personal health, and more. As we move forward in 2019, we are looking to build upon our catalog and expand out topic areas. Review the Future Directions Technology Policy and Ethics catalog of articles.

We are currently seeking submissions of original content for 2019, 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. Learn more about submitting an article through the author guidelines.

Current Activities in our Technical Communities

IEEE Big Data:
Join the IEEE Special Interest Group (SIG) on Big Data with Computational Intelligence. This SIG will focus on the technical challenges and applications of CI in big data. We envision that the combination of big data with a large collection of CI algorithms will reach the level of true artificial intelligence. Join the LinkedIn group.

IEEE Blockchain:
The latest edition of IEEE Blockchain Technical Briefs is now available. This issue explores permissioned blockchain in enterprise environments, the significance of server nodes, a blockchain digital identity solution, and use of blockchain as a platform for open execution of code, services, and applications. IEEE Blockchain Technical Briefs seeks short article submissions that are 800-1200 words and conceptual in nature. For information on contributing an article, see the Editorial Guidelines.

IEEE Brain:
Read the latest issue of BrainInsight, the IEEE Brain Initiative quarterly newsletter. The latest edition includes a "student corner," a reflection from several who attended the BIO-X summer school, three research articles, and an event report of the meeting of global current and emerging Brain Initiatives.

IEEE Cloud Computing:
IEEE Cloud Computing is a key platform for researchers, academicians, and industry practitioners to share and exchange ideas regarding cloud computing technologies and services, as well as identify the emerging trends and research topics that are defining the future direction of cloud computing. Come be part of this revolution as we invite posts for The Clear Cloud blog. Topics include but are not limited to the following: cloud deployment frameworks, cloud architecture, cloud native design patterns, testing services and frameworks, and more.

IEEE Cybersecurity:
Botnet Fingerprinting: Anomaly Detection in SMTP Conversations
This article presents the results obtained during research on detection of unsolicited emails sent by botnets. The distinction from most existing solutions is that the presented approach is based on the analysis of network traffic, specifically the sequence and syntax of SMTP commands observed during email delivery. The authors present several improvements for detecting unsolicited email sources from different botnets (fingerprinting) that can be used during network forensic investigation. Read

the article.

IEEE Digital Reality:
The IEEE Digital Reality Podcast Series features talks with industry leaders in virtual reality, augmented reality, XR, human augmentation, smart robots, and much more, keeping you at the forefront of advancements in these ever-growing immersive technologies. In our latest podcast, Kathy Grise, IEEE Future Directions, gives an overview of the IEEE Digital Reality Initiative and provides highlights of a panel discussion she moderated at the Augmented World Expo (AWE).

IEEE Future Networks:
Upcoming Webinar: Networked Electricity. Internet technology and cellular communications technology have transformed many aspects of how we communicate, and caused us to consider and do things in ways not previously possible or, for many, even imaginable. As we advance communications technologies with new concepts and capabilities, it makes sense to do the same for electricity. Join us Tuesday, 26 February at 11am EST to learn how we can think about communications and electricity in new ways. Register on our website.

IEEE Internet of Things:
IEEE is pleased to announce the release of *IEEE Internet of Things Magazine*, which is a forum for practitioners to share experiences, develop best practices, and establish guiding principles for technical, operational, and business success. The inaugural edition can be downloaded on our website.

IEEE Life Sciences:
IEEE Life Science Committee focuses on the promotion of research fields in medicine, engineering, life science, and standards through the lenses of multi-disciplines. LS supports the advances in research for extreme environments and veterinary engineering medicine. These topics are communicated through a modernized newsletter, the IEEE Life Science Conference, and multiple initiatives at IEEE conferences.

IEEE Rebooting Computing:
Join us at the newly reorganized International Nanodevices and Computing (INC) Conference, 3-5 April 2019 at Minatec in Grenoble, France. INC includes predictions on devices for computing and communications, computer architecture, and applications. The most recent updates of the International Roadmap for Devices and Systems (IRDSâ„¢) will be presented, and highlights from the latest IEEE International Conference on Rebooting Computing (ICRC) and Quantum Computing workshops will be included.

IEEE Smart Cities:
The 2019 IEEE Smart Cities webinar series is being developed. Are you interested in providing a webinar to the IEEE Smart Cities Community? The proposed webinar must have a topic geared towards engineers or individuals involved in Smart Cities development. Visit the IEEE Smart Cities website for more information. Currently scheduled webinars include: 21 February - Blockchain for Project Managers Risk and Opportunities and 20 March - Evaluation of the Concept of the Smart City Through Local Regulation and the Importance of Local Initiative.

IEEE Smart Grid:
Watch the new live tutorial presented in four sessions starting 29 January 2019, "Modern Grid Design Standards Driving Smart Grid Implementation" by Doug Houseman. This tutorial will include the history of current design standards (and drawings) and the changes in issues with the grid and their direct impact on design standards. The tutorial will conclude with recommendations for updating those

standards. Visit our website for more information.

IEEE Software Defined Networks (SDN):

IEEE SDN now offers a collection of online courses in the field of Software Defined Networking, Network Function Virtualization, and related technologies. Learn from industry experts about topics that include the fundamentals of SDN and NFV, security and management challenges, the latest SDN open source platforms, and more. Participants also have the opportunity to earn Continuing Education Units (CEUs) and Professional Development Hours (PDHs) with each course. Access the courses.

IEEE Sustainable ICT:

Jaafar Elmirghani, IEEE Sustainable ICT Initiative Co-Chair, recently spoke about Sustainable ICT and Sustainability through ICT at the Technology Time Machine Symposium. Please visit IEEE.tv to view the video recording of Jaafar's talk.

IEEE Symbiotic Autonomous Systems (SAS):

New Complimentary White Paper Now Open for Comments: The goals of this White Paper are to further develop the ideas presented in the first White Paper: (1) to highlight impacts that are clearly identifiable today, and (2) to indicate emerging issues, thus providing a starting point to those involved in making public policy to understand the technical fundamentals, their evolution, and their potential implications. Note that this White Paper is intended to be self-contained, without requiring the reader to read the previous White Paper. It is available for free to all Technical Community members. If you are not a Technical Community member, join today for free.

IEEE Transportation Electrification (TEC):

New in 2019, IEEE TEC is launching an online tutorial series. Our first tutorial is scheduled for February 4th and is entitled: Smart Power Electronics Based Active Battery Energy Management Systems for Electric Transportation. For complete details on the tutorial series and registration details, visit our website.

IEEE Future Directions Events and Activities

2019 IEEE Power and Energy Society Innovative Smart Grid Technologies Conference (ISGT), 17-20 February 2019, Washington, D.C., USA

2019 IEEE 1st Global Conference on Life Sciences and Technologies (LifeTech), 12-14 March 2019, Osaka, Japan

IEEE International Conference on Rebooting Computing (ICRC)-Digest, part of 2019 International Nanodevices and Computing Conference (INC), 3-5 April 2019, Grenoble, France

2019 IEEE 5th World Forum on Internet of Things (WF-IoT'19), 15-18 April 2019, Limerick, Ireland

2019 IEEE Sustainability through ICT Summit (StICT), 18-20 June 2019, Montréal, Quebec, Canada

2019 IEEE Transportation Electrification Conference and Expo (ITEC), 19-21 June 2019, Novi, MI, USA

2019 IEEE Conference on Network Softwarization (NetSoft), 24-28 June 2019, Paris, France

[AIAA/IEEE Electric Aircraft Technologies Symposium (EATS)](#), 20-22 August 2019, Indianapolis, IN, USA

[2019 IEEE Secure Development (SecDev)](#), 25-27 September, 2019, McLean, VA, USA

[2019 IEEE 5G World Forum (5GWF'19)](#), 30 September - 2 October 2019, Dresden, Germany

Submission/Subscribe Information

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Members of an IEEE Future Directions initiative technical community receive this newsletter automatically. If you did not receive a copy of this newsletter directly, or you would like to learn more about a particular initiative, you can subscribe by [joining an initiative](#).

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