IEEE Future Directions Newsletter

In this Issue:

- Save the Date for Upcoming IEEE Brain Virtual Conference on Bioelectronics on 26 November
- IEEE Learning Network - Special Offer for IEEE Future Directions Technical Communities
- IEEE Future Directions Technical Communities
- Technology Policy and Ethics
- IEEE Global Communications Conference (Globecom 2019)
- Current Activities in our Technical Communities
- IEEE Future Directions Events

Save the Date for Upcoming IEEE Brain Virtual Conference on Bioelectronics on 26 November

Mark your calendars! The IEEE Brain Initiative will be hosting its first online virtual conference on 26 November. In this virtual conference you will learn fundamental principles of bioelectronic systems and hear from world experts about how to build a successful career in this emerging research field.

In the morning session, you will hear three tutorials presented by leading researchers: 1) Organic bioelectronic interfaces (Jonathan Rivnay), 2) Bioelectronic microfabrication (John Seymore), and 3) Mechanics of bioelectronic devices (Nanshu Lu). In the afternoon session, you will participate in an interactive question and answer session focused on career development. The first career development panel will focus on issues facing new and early-stage researchers, while the second panel will focus on building and maintaining leading research groups and working with industry (John Rogers, Kip Ludwig, Bianxiao Cui). In these sessions, the panelists will answer your questions about navigating the bioelectronics research field and share some insights from their experiences.

Registration will be opening soon. For more information, please stay tuned to the IEEE Brain web portal.

IEEE Learning Network - Special Offer for IEEE Future Directions Technical Communities

The new IEEE Learning Network (ILN) provides easy access to online learning content from across IEEE, all in one place. IEEE members qualify for discounts on most courses on the ILN at iln.ieee.org. Browse more than 800 courses on core and emerging technologies, leadership skills, and more. Get the skills you need to advance in your career.

For a limited time, purchase any of the IEEE Future Directions courses for 50% off the

member price by entering FDCEDU at checkout. Offer is valid until 23 October and may be redeemed only once. View the courses included in this offer on ILN.

IEEE Future Directions Technical Communities

In IEEE Future Directions, we're committed to bringing you the best knowledge, resources, and opportunities in emerging technologies within IEEE. As we evolve and expand our offerings, subscription to our current Future Directions Technical Communities for IEEE Society members will be free as a Society member benefit. IEEE Members and non-members will pay a fee. These communities include: Blockchain, Brain, Digital Reality, Future Networks, and Rebooting Computing. Details of this change, including IEEE member and IEEE Student member rates, can be reviewed as you renew your memberships for 2020..

As a participant of our Technical Communities, you will receive access to our growing suite of content, including online courses, webinars, white papers, videos, and more at discounted rates.

Thank you for being a part of our Technical Communities. We value your involvement and look forward to your continued participation in IEEE Future Directions.

Technology Policy and Ethics

IEEE 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 currently seeking submissions of original content for 2019, 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.

Towards Zero-Trust Database Security - Part 1
By Walid Rjaibi and Mohammad Hammoudeh

The rise of external threats, internal threats and data breaches is driving enterprises to implement zero-trust security to better protect their IT assets and reduce risk. While zero-trust security for networks and identity management systems have received a great deal of focus, very little attention has been devoted to zero-trust security for database systems. This is a major issue as database systems are the custodian of enterprises' most critical data and are often the primary target of both external and internal attacks. After all, databases contain valuable data such attackers want to steal. In Part One of this series, we explore both the direct and indirect means through which the same data in a database system can be accessed and the challenges they pose to adhering to the basic tenets of zero-trust security. In Part Two, we outline a set of solutions that are most suitable to address these challenges and enable enterprises to implement zero-trust database security without negatively impacting core database tenets such as query performance. Read more.

Artificial Intelligence Powered EEG-EMG Electrodes for Assisting the Paralyzed
By Sunil Jacob, Varun G Menon, and Saira Joseph

Paralysis is the loss of muscle function in any part of a person's body. This occurs when the

passage of messages between the brain and muscles is hindered. Paralysis is more widespread than ever before; a recent survey shows that around the world, 1 out of 111 people are affected by paralysis. This raises the need for developing an interface to aid people who suffer from this unfortunate condition. Paralysis limits a person from completing even basic chores in life without assistance. At times, the paralyzed parts become so stiff, it is difficult for the caregivers to provide assistance. Physiotherapy is not the best option because of its various limitations such as the need for multiple weekly appointments, long sessions and high cost. Most of our previous work had focused on designing of efficient exoskeletons for rehabilitation. But exoskeletons introduced additional burdens to patients with their heaviness and complexity to the caregivers. In this article we discuss an efficient and better way by which friends and caregivers can assist the paralyzed to improve their lifestyle. The primary objective of this article is to discuss the working of Artificial Intelligence based Electroencephalograph (EEG) - Electromyogram (EMG) electrodes for Paralyzed (AI-EEP). This technique has been recently investigated by the Center for Robotics laboratory at SCMS School of Engineering and Technology, India. This device will help paralyzed people move independently by using the recorded movements of a normal person as a reference. Read more.

Automated Machine Learning for Future Networks Including 5G

By Shagufta Henna and Alan Davy

It is possible to select a set of potential candidate machine learning (ML) models based on 5G use-case requirements and characteristics of the ML model, however, it is extremely difficult to predict the best model right at the start. This work proposes an automated ML framework called automated 5G machine learning (Auto5GML), which can be integrated with the unified ML architecture by the International Telecommunication Union (ITU). Based on the potential search space of ML models, the Auto5GML framework selects the best model to be used for a 5G use-case. It evaluates the potential models by inserting data and running them in parallel by using data parallelism or model parallelism. The proposed framework can optimize the learning performance based on the strict use-case requirements. Read more.

IEEE Global Communications Conference (Globecom 2019)

IEEE Communications Society (ComSoc) is pleased to offer the Industry Program and Distinguished Industry Speaker lineup for our flagship conference, Global Communications Conference (GLOBECOM 2019) to be held on 9-13 December on the beautiful Big Island, Hawaii! GLOBECOM 2019 will feature a highly technical program and also an excellent Industry Program which includes industry distinguished speaker panels, tutorials, workshops, forums, and training programs. In addition, IEEE Future Directions will be present at the event in the Roadmapping Communications Technologies Industry Panel and the Workshop on Blockchain in Telecommunications: Emerging Technologies for the Next Decade and Beyond.

Register today for the opportunity to meet and learn from the industry experts. Early registration discounts are available until 8 November 2019.

Current Activities in our Technical Communities

IEEE DataPort™ is now available for use! Go to ieee-

dataport.org to be connected to this valuable one-stop shop data repository which serves the growing Big Data technical community. Sign up for the IEEE DataPort™ Newsletter to get weekly updates, including the latest and most popular data-sets, delivered to your inbox.

Visit Web Portal

Join us at IEEE GLOBECOM 2019 for our Workshop on Blockchain for Telecommunications. This workshop, to be held on 13 December 2019 in Waikoloa, HI, USA, will introduce the basic concepts of blockchain applied to telecommunications (including 5G, IoT, Networking, Cloud, and more) and will discuss emerging trends and challenges ahead. It will also provide a forward-looking perspective on the emerging technologies and key applications in this new field. For details, visit the workshop website.

Visit Web Portal

In September, 16 teams competed at the BR41N.IO Hackathon at ARS Electronica 2019 in Linz, Austria. The IEEE Brain Initiative is a co-sponsor of the BR41N.IO Hackathon series, providing the BR41N.IO IEEE Brain Prize. The next hackathon will be co-located with IEEE SMC 2019 in Bari, Italy from 6-7 October. Learn about this and additional upcoming BR41N.IO events and register to participate here.

Visit Web Portal

The *IEEE Transactions on Cloud Computing* is a scholarly journal dedicated to the multidisciplinary field of cloud computing. It publishes peer-reviewed articles that present innovative research ideas and application results of cloud computing, focusing on key technical issues related to theory, algorithms, systems, applications, and performance.
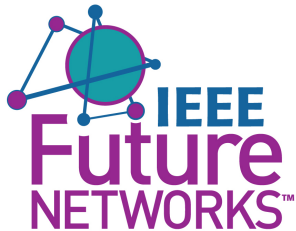
Visit Web Portal

IEEE Secure Development (SecDev) 2019 is being held 25-27 September 2019 in McLean, Virginia, USA. Be sure to follow #IEEESecDev on Twitter for more information as it becomes available.

Visit Web Portal

Don't miss the most essential AR/VR conference and Expo coming up this October in Munich, Germany. Visit www.awexr.com to learn more. In the meantime, you can listen to the IEEE Digital Reality podcasts on the portal. Our latest episode features Bill Tonti on the topic of Technology Roadmaps, and a new one, featuring Jeewika Ranaweera, will be released soon. Discover podcasts, newly published white papers, industry events, and more on the web portal.

Visit Web Portal

View the plenary keynote speakers at the IEEE 5G World Forum via a livestream through IEEE.tv. Keynotes will be available for viewing 8:30 - 10:30 (CEST) Monday 30 September through Wednesday, 2 October 2019. Register at IEEE.tv.

Visit Web Portal

The 2020 IEEE 6th World Forum on Internet of Things (WF-IoT 2020) is the premier conference of the IEEE IoT Initiative and will be held in New Orleans on 5-9 April 2020. WF-IoT 2020 seeks submissions of technical papers and proposals focused on contributions to enhance and accelerate the adoption of IoT technologies and applications for the benefit of humanity. For more information, please visit the conference website.

Visit Web Portal

IEEE Life Science (LS) 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 Global Conference on Life Sciences and Technologies (LifeTech), and multiple initiatives at IEEE conferences.

Visit Web Portal

The June 2019 issue of *Computer* focuses on Quantum Realism. It explores what has been accomplished in quantum computing, ideas that have been demonstrated, and where the path to the future lies. Read the Guest

Editors' introduction, which examines the realistic challenges facing the future of quantum computing, authored by Travis Humble and Erik DeBenedictis, Co-Chairs, IEEE Quantum Initiative.

Visit Web Portal

Have you registered for IEEE Rebooting Computing Week 2019 yet? This year's RC Week, 4-8 November 2019 in San Mateo, California, USA, provides an exciting, interactive series of events focused on advancing the next era of computing. Join us at the 4th IEEE International Conference on Rebooting Computing (ICRC), Industry Summit on the Future of Computing, and Winter IRDS™ Session to hear from and connect with industry and academic leaders in the computing field. The deadline for advance registration discount is 1 October. Learn more and reserve your seat.

Visit Web Portal

IEEE Smart Cities Standard Working Group P2784 - Webinar Series: Each month a webinar will be held based upon the proposed IEEE P2784 Smart City Planning and Technology Guide. Upcoming webinars are:

Exploring Cybersecurity Best Practices in Your Smart City - 8 October 2019
Exploring Fleet Electrification in Your Smart City - 22 October 2019

Past webinars will be available in the IEEE Smart Cities Resource Center.

Visit Web Portal

A new course, Introduction to IEEE Std 1527-2018: Connecting Distributed Energy Resources, is now available on the IEEE Learning Network (ILN). Learn the latest in engineering, technology, and more. The ILN makes it easier for smart grid professionals to find IEEE online educational content, so start learning now!

Visit Web Portal

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.

Visit Web Portal

Charles Despins, an IEEE Senior member and Co-Chair of the IEEE Sustainable ICT Initiative, provided his thoughts about "Making Information and Communications Technology More Sustainable" in a Q&A article. Read more at IEEE Transmitter™.

Visit Web Portal

Earlier in 2019, TEC launched a set of online tutorials presented by Sheldon Williamson available on the IEEE TEC Resource Center:
Session One: Smart Power Electronics Based Active Battery Energy Management Systems for Electric Transportation
Session Two: Novel Power Converters for DC Fast Charging
Session Three: Integrated PV/Smart-grid Based Charging Applications
Session Four: High-Efficiency, Wireless Fast Charging Concepts and Methodologies

Visit Web Portal

IEEE Future Directions Events

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

2019 IEEE International Smart Cities Conference (ISC2), 14-17 October 2019, Casablanca, Morocco

2019 IEEE Rebooting Computing Week, 4-8 November 2019, San Mateo, CA, USA

Workshop on Blockchain in Telecommunications: Emerging Technologies for the Next Decade and Beyond at IEEE Globecom, 9-13 December 2019, Waikoloa, Hawaii, USA

Subscribe to this Newsletter
Subscribers 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.

View the Newsletter Archive
Read past issues on our website.

Contribute Content
If you would like to submit items to be considered for inclusion in this newsletter, please send an email to ieeefd-digital@ieee.org.

IEEE

Unsubscribe | Privacy Policy | Contact