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IEEE Future Directions Newsletter



ISSUE 13 | May 2018

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Collaborate with Global 5G Experts at the 2018 IEEE 5G World Forum

Registration is now open for the [2018 IEEE 5G World Forum](#) (5GWF'18) to take place 9-11 July in Santa Clara, CA, USA. The IEEE 5G World Forum program will delve into practical aspects of 5G development and examine opportunities for innovation in vertical markets and new applications where 5G serves as the entry point.

[Program highlights](#) include [keynote speakers](#) from China Mobile, Facebook, National Instruments, NSF, Stanford University, T-Mobile, VMware, Nokia, AT&T, Altiostar, and Volkswagen. The IEEE 5G World Forum will offer a rich program of:

- Plenary and vertical industry keynotes
- A Startup Forum: new companies in the 5G space showcasing their innovation, promoting engagement of start-ups
- A Worldwide 5G Industry Forum Session: participants will outline their national 5G strategy and adoption status and discuss alignment and harmonization
- 10 Vertical/Topical tracks:
 - Vertical tracks focused in markets expected to be early adopters of 5G, including media and entertainment; intelligent transport; e-health / mobile health; Industrial Internet of Things; 5G applications
 - Topical tracks will provide deep dives into advancements and challenges related to 5G: open API, unbundled, Open Source and testbeds; security and privacy; policy and regulation; standards; and optics
- 17 technical paper sessions
- Workshops, tutorials and industry demos

Discounted advance registration rates are available until 15 June. Learn more and register at the [conference website](#).

See Beyond Tomorrow at the IEEE Future Directions

IEEE Future Directions Communities



Technology Time Machine

Join us for the [2018 Technology Time Machine \(TTM\) Symposium](#) on 31 October-1 November 2018 at the Hilton San Diego Resort & Spa in San Diego, CA, USA. The IEEE Technology Time Machine is the IEEE's flagship conference on future technology directions. The [program](#) will provide an engaging discussion on various topics including autonomous vehicles, neuroscience, agricultural food systems and technology, mixed reality, far future technologies and more. Each day will begin with an exciting presentation from our [keynote speakers](#):

- **Poppy Crum**, Chief Scientist at Dolby Laboratories, Integrating neuroscience and sensory data science into algorithm design, technological development, and technology
- **Seval Oz**, CEO, Aurima, building autonomous vehicle sensor fusion software

Early discount registration is available until **1 October 2018**. Learn more and register at the [conference website](#).

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.

Ethical Issues in Secondary Use of Personal Health Information

by *Thomas Gallagher, Kudakwashe Dube, and Scott McLachlan*

The accessibility of personal health information (PHI) will increase on the Internet of the future to provide timely support for both primary and secondary uses. Although PHI for secondary uses is generally anonymized, its widespread distribution on the Internet raises ethical concerns. The PHI should remain an individual's most closely guarded asset. While other forms of personal data represent what the person does, owns, or knows, PHI represents what the person is. PHI describes the biological attributes of the human being, often containing longitudinal records of wellness, illness, test results, and treatments. These characteristics amplify the seriousness and un-reversible consequences that uniquely differentiate breaches or disclosures of PHI data from other forms of data breach. In conducting risk assessment analysis, the result of even a single PHI data breach can be catastrophic. As it is impossible to place a price on our health, it is similarly impossible to place a price on PHI. Risk assessment calculations involving annual loss expectancy, single loss expectancy, or annualized rate of occurrence are irrelevant when PHI has been breached. In light of this, the questions of: granting the patient the right to consent, that is, opt-in or out, of the de-identification and subsequent secondary use of their PHI; and finding synthetic alternatives to de-identified PHI for certain type of secondary uses to protect patient privacy, urgently need to be addressed.

[Read More](#)

Semantic Web in the Age of Big Data: A Perspective

by *Syed Ahmad Chan Bukhari, Ali Kashif Bashir, and Khalid Mahmood Malik*

We are awash with "Big Data" to this very day because of the technological



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advancements made during the past decade. The notion of big data refers to the datasets that: are too gigantic in size to be processed by conventional databases and management techniques (volume), are so extremely diverse that no single data model can capture all elements of the data (variety), and are produced or gathered at an unprecedented scale (velocity). Because of this sheer volume, variety and velocity, enterprises are facing challenges like data heterogeneity, diversity and complexity. On the other hand, this big data era came with big opportunities. It can transform our traditional way of decision making. Enterprises with the technical expertise of managing big data are now replacing their usual guesswork and laborious legacy data modeling based decision-making processes with facts.

[Read More](#)

Current Activities in our Technical Communities

IEEE 5G:

Registration is now open for the [2018 IEEE 5G World Forum](#)! Be a part of the global collaboration creating 5G for the benefit of society 9-11 July 2018, Santa Clara, CA, USA. Learn more at the [conference website](#).

IEEE Big Data:

Register to attend the [2018 IEEE International Conference on Computers, Software and Applications \(COMPSAC\)](#) 23-27 July 2018 in Tokyo Japan, highlighting the Data Sciences, Analytics, and Technologies (DSAT) symposium, Big Data Governance and Metadata Management (BDGMM) workshop, and mini-TTM panel on "A Smarter Future" with New and Emerging Innovations and Predictions.

IEEE Blockchain:

The second course in the IEEE Blockchain eLearning series is now available. [Introduction to Ethics of Blockchain Technology](#) provides an overview of approaches in normative ethics that can be used to evaluate blockchain technologies. Participants will be made familiar with consequentialism, deontology, virtue ethics and care ethics. Furthermore, a simple method for constructing an ethical case study is presented and explained. Meet your Continuing Education Units (CEU) and Professional Development Hours (PDH) requirements with this course.

IEEE Brain:

The first issue of [BrainInsight](#), the IEEE Brain Initiative eNewsletter is now available.

Brain-Computer Interface Designers Hackathon Series: The IEEE Brain Initiative is a sponsor of the BR41N.IO, a Brain-Computer Interface Designers Hackathon Series held globally. In 2018, five dates and locations have been selected for engineers, programmers, designers, artists or enthusiasts to collaborate to rapidly produce fully functional BCI prototypes. There are several predefined projects at each hackathon, which the participants can choose to work on. Upcoming hackathons include 20-21 May in Asilomar, CA, USA and 15-16 July in Honolulu, HI, USA. The last two events in 2018 will be held in Linz, Austria and Miyazaki, Japan. [Read more](#).

IEEE Cloud Computing:

Read the latest issue of [IEEE Cloud Computing](#) magazine which explores topics including osmotic message-oriented middleware, Topology and Orchestration Specification for Cloud Applications (TOSCA), message queueing and notifications challenges and opportunities, and other topics.

IEEE Cybersecurity:

The [IEEE Secure Development \(SecDev\) Conference](#) will take place 30 September-2 October 2018 in Cambridge, MA, USA. SecDev is distinguished by its focus on how to

"build security in" (and not simply to discover the absence of security). Its goal is to encourage and disseminate ideas for secure system development among both academia and industry. Developers have valuable experiences and ideas that can inform academic research, and researchers have concepts, studies, and even code and tools that could benefit developers. Learn more at the [conference website](#).

[IEEE Digital Reality:](#)

Visit the newly-launched [Digital Reality portal](#) for the latest news, events, and resources on AR/VR/MR and related technologies. We also invite you to attend the [Augmented World Expo \(AWE USA 2018\)](#), 30 May-1 June 2018 in Santa Clara, CA, USA where IEEE Digital Reality and IEEE Standards Association have organized a panel session on Immersive Experiences and Applications, and Non-technical Impacts. Subject matter expert speakers from a diverse range of areas based upon their experiences, will comment on current and past "reality" implementations, experiences, implications to humans, and share an outlook to the future. Topics are not limited to the technical aspects, but also the social, ethical, legal, and policy impacts.

[IEEE Green ICT:](#)

The latest [IEEE Talks Green ICT](#) with Dr. Earl McCune discusses the multi-disciplinary approach the initiative has taken to greening ICT and other topics.

[IEEE Internet of Things:](#)

On 8-9 May 2018, the IEEE IoT Vertical and Topical Summit on Agriculture was held at the Borgo San Luigi in Monteriggioni, Tuscany. Experts and leaders from all over the world addressed the implementation of IoT solutions under the theme, "The Digital Revolution-Farming 4.0!" A summary of the Summit along with the informative presentations from this important and exciting event will be posted shortly at our [website](#).

Also, register for our upcoming educational course: [IoT and M2M Essentials](#), 6 June 2018. This one day essentials course covers the most important things you need to consider when developing a new Internet of Things or Machine-to-Machine product or service. [Register](#) on our website.

[IEEE Life Sciences:](#)

Life Sciences Tutorial On Extreme Environments at EMBC'18

The workshop, initiated and supported by the IEEE Life Sciences Committee, intends to bring together world-leading experts in the areas of engineering and medicine in scuba diving, space and tactical and emergency services. The audience will have the opportunity to see presentations about the fundamental medical concepts of physiological adaptation, as well as technological advances to assess physiological monitoring in these extreme environments and to process acquired data. [Read more](#).

Tutorial and Special Session Proposals for Life Sciences Conference

The deadline date for submission of tutorial and special session proposals has been extended until 4 June. Two and four-page papers are now being accepted for the conference. [Read more](#).

[IEEE Rebooting Computing:](#)

Artificial Intelligence and Machine Learning Applied to Cybersecurity

In late 2017, IEEE convened 19 experts from Artificial Intelligence (AI), Machine Learning (ML), and cybersecurity sectors for a two-and-a-half-day collaborative session with the goal of collectively authoring a timely trend paper focused on the complex question: Given the rapid evolution of AI/ML technologies and the enormous challenges we all face with respect to cybersecurity, what is needed from AI/ML, where can it be best applied, and what must be done over the next ten years? [Read](#)

[more](#).

[IEEE Smart Cities:](#)

The Fourth [IEEE Annual International Smart Cities Conference \(ISC2 2018\)](#) will be held in Kansas City, MO, USA 16-19 September 2018. As the flagship conference sponsored by the IEEE Smart Cities Initiative, ISC2 2018 will bring together researchers and practitioners in a collaborative smart cities discussion, including scholars, citizens, policymakers, administrators, infrastructure operators, industry representatives, economists, sociologists, and academicians.

[IEEE Smart Grid:](#)

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

[IEEE Software Defined Networks:](#)

The [4th IEEE International Conference on Network Softwarization \(NetSoft 2018\)](#) will be held 25-29 June 2018 at Concordia University in Montreal, Canada. The conference theme is "Achieving smart network softwarization."

[IEEE Symbiotic Autonomous Systems Initiative:](#)

Call for Speakers:

- [The Rise of Symbiotic Autonomous Systems Workshop](#) at TTM 2018: The workshop aims at clustering a broad community of researchers (both in academia and industry), practitioners from the industry and institutions that are likely to be affected by the dissemination of autonomous systems and are responsible to manage the social, legislative and ethical implications.
- [Fostering Technology, Ethics, Public Policy, and Societal Enablers Workshop](#) at SMC 2018: This workshop will allow for the discussion of the implementations and implications of symbiotic systems. In addition to technical aspects, emphasis will be placed on important factors that need to be taken into consideration such as environmental, structural, and socio-economic constraints. The workshop will consist of presentations of research, technology-policy and ethical, legal and societal issues as keynotes and technical talks and stimulate active participation of all attendees.

[IEEE Transportation Electrification:](#)

The March edition of the *IEEE Transportation Electrification Newsletter* is now available. The issue features articles that focus on the update of technology development for electric vehicle charging with different wireless power transfer technologies, including the inductive power transfer, capacitive power transfer, and roadway power transfer. [Read more](#).

IEEE Future Directions Events and Activities

[Augmented World Expo](#), 30 May-1 June 2018, Santa Clara, CA, USA

[2018 IEEE Global Blockchain Summit Korea](#), 7-8 June 2018, Seoul, Korea

[2018 4th IEEE Conference on Network Softwarization and Workshops \(NetSoft\)](#), 25-29 June 2018, Montreal, QC, Canada

[2018 IEEE 5G World Forum \(5GWF'18\)](#), 9-11 July 2018, Santa Clara, CA, USA

[2018 IEEE International Conference on Computers, Software and Applications](#)

[\(COMPSAC 2018\)](#), 23-27 July 2018, Tokyo, Japan

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

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

[IEEE Future Directions Technology Time Machine 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

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