IEEE Future Directions Newsletter

In this Issue:

- Exploring Blockchain & Beyond
- Technology, Policy and Ethics
- Activities in Our Current Technical Communities
- IEEE Future Directions Events
- Activities in Our Graduated Technical Communities
- Open Call for Proposals

Exploring Blockchain & Beyond

The inaugural IEEE Global Emerging Technology (GET) Blockchain Forum was held virtually on 7-11 November. This successful event brought together over 1,700 attendees for a full week of activities with the goal of exploring future technologies related to "Blockchain & Beyond!"

Powered by IEEE Blockchain and technically co-sponsored by IEEE Digital Privacy, the IEEE GET Blockchain Forum was a multidisciplinary event featuring insight from experts in industry, academia, and research that addressed the challenges of blockchain while identifying and investigating the possibilities of future blockchain/DLT networks.

Notable highlights included distinguished keynotes, panel discussions, technical paper presentations, a full day of tutorials, and a variety of symposiums centered around seven topical tracks including blockchain applications in energy, food supply chain, future networks, healthcare, logistics & global supply chain, and metaverse. IEEE Digital Privacy spearheaded a two-day track with a focus on cybersecurity & privacy in blockchain and related emerging technologies.

In case you missed the event, plans are underway to make over 90 hours of content available on-demand soon. Stay tuned to the IEEE GET Blockchain website for additional details and visit IEEE Blockchain for information on more upcoming events and opportunities in the blockchain space.

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, 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.

Exploring Privacy Measures in the Community Metaverse

By **Klimis Ntalianis** and **Vasileios Yfantis**, *University of West Attica*

Recent technological advancements are increasingly altering how individuals interact with the physical world. As a result, our online and digital presences are monitored and leveraged to reveal details about us. Social manipulation is one of the main numerous sources that puts this knowledge in danger [1]. Web sensors can be used by individuals, businesses, and government organizations to detect both natural and artificial factors in each area. Such records may be preserved in virtualized storage for a variety of reasons. Security cameras are one approach to collecting and analyzing the data, which also includes movement and location analysis, consolidation, and trend detection.

Read More

Effective Spatio-Temporal Filtering for Progressive Radiation Dose Reduction in Cardiac Imaging — Part 1

By **Ayush Dogra** and **Sanjeev Kumar**, *1CSIR- Central Scientific Instruments Organization, Chandigarh*

It is well-known that X-ray radiation is ionizing and carcinogenic in nature. As a result, low-dose X-ray imaging has been a recent trend gaining widespread popularity. Based on research statistics, each time X-ray imaging is performed, the patient becomes more likely to develop a malignancy. Considering extreme ethical and social responsibility, industry professionals are committed to decreasing the amount of radiation exposure in cardiac imaging as much as possible. There is a need to design digital processing algorithms that can provide requisite advantages such as high temporal and spatial resolution and swift patient throughput. In this paper, we propose an efficient algorithm that can enable such an indigenous system to be developed at an affordable rate. The novelty of the proposed method is that it combines all the necessary ideal techniques, but after rigorous experimentations, is computationally far less complex. This algorithm contributes to addressing the problems upheld by existing methods in terms of time consumption and effectiveness. The current problem statement is well defined in the context of a demonstration of problems and potential solutions based on experimental observation and theoretical protocols, along with a demonstration of a substantial solution.

Activities in Our Current Technical Communities

The Q3 2022 issue of IEEE Blockchain Tech Briefs is now available! This issue features a selection of articles that explore mathematical topics in blockchain and digital ledger technology, PoW (Proof of Work) as PoS (Proof of Stake) algorithm, the technology and potential of stablecoin, and how to build a blockchain using the asynchronous composition model. Read the Latest Issue.

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Join us on 7 December 2022 at 1:00 pm ET for an engaging discussion on data collection and its use during electric vehicle charging. There are benefits to collecting the data but it also raises questions about privacy. This is the first of a 2-part series. The first panel will focus on what types of data are collected and for what purpose, where the data is sent, and how it is used. The second panel planned for 2023 will address the privacy challenges. Learn more and register here.

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Don't miss the second IEEE International Conference on Intelligent Reality (ICIR) where we will explore opportunities and challenges in the immersive environments of AR/VR/MR and the metaverse. The 3-day virtual event will take place from 14-16 December 2022. We have a great lineup of keynote speakers, invited panels, and demonstrations. Register today.

During our last webinar, Digital Twin Opportunities with Augmented Reality, Magic Leap and NavVis discussed the enterprise applications and value that can be delivered by using digital twins in production environments, warehouses, offices, and retail stores. The presentation also provided an overview of the technical aspects of localization and 3D mapping in complex business environments. Access the webinar free on-demand.

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We've been busy! The 5th Future Networks World Forum (formerly 5G World Forum), a hybrid event from Montreal, Canada, hosted nearly 500 attendees across three days investigating current and future network technologies and use cases. You can still register to view our two most recent events on demand: the 2nd Connecting the Unconnected Summit (including the announcement of the 2022 CTU Challenge winners!) and the 5th 5G Workshop on First Responder and Tactical Networks.

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The IEEE Public Safety Technology Initiative seeks to become the global Center of Excellence for public safety agencies, suppliers, practitioners, researchers, and all industry participants to discuss and exchange ideas on how emerging technologies can help public safety personnel be more effective in their work and support their sustained health and wellness. The initiative is working towards hosting its first conference in October 2023. Join a Committee today to help make an impact in this vital field.

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The IEEE Quantum Initiative is IEEE's leading community for all projects and activities on quantum technologies. Want to get more involved in the activities of the IEEE Quantum Initiative? Fill out the IEEE Quantum Initiative Interest form to share the subject areas and activities you would like to engage in, and we'll reach out with opportunities. Get Involved in IEEE Quantum Activities.

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The call for papers for the IEEE Sustainable Smart Lighting World Conference & Expo (LS:18) is open, which will take place in Mumbai on 8-10 June 2023. LS:18 aims to provide an excellent forum for scientists and engineers worldwide, in both academia and industry, to share and exchange the latest progress in the Science and Technology of Lighting. The full paper submission deadline is 15 January 2023.

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Did you miss our 2nd Low-Earth Orbit Satellite Systems Workshop? You can still register to view it on demand. The LEO SatS project intends to coordinate and consolidate IEEE's capabilities and long-standing presence in the Low Earth Orbit Satellites and Systems field to enhance IEEE's visibility in the space sector, increase cooperation between

academia, industry, and governments, attract high-quality university and college students to IEEE, and create networks to advance technologies for low-latency near-real-time applications (possibly leading to new standards and roadmaps).

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The mission of the Telepresence project is to advance telepresence technology that would enable a user's remote presence at a different physical location: a) feeling as if being there, and b) having a similar effect as if being there – in appearance to others and ineffectual action, via telerobotics. The project will focus on teleoperations, including examples like operating/manipulating equipment as if present in a cabin/control room, moving heavy equipment, driving agricultural machines, and performing telemedicine. Visit the Telepresence project website to learn more.

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IEEE Future Directions Events

IEEE Virtual Panel on Electrical Vehicle (EV) Charging Data
Virtual | 7 December 2022

2022 IEEE 2nd International Conference on Intelligent Reality (ICIR)
Virtual | 14-16 December 2022

IEEE Sustainable Smart Lighting World Conference & Expo (LS:18)
Mumbai | 8-10 June 2023

Activities in Our Graduated Technical Communities

The IEEE Brain Initiative was formed in 2015 to create a technical community to facilitate cross-disciplinary collaboration and coordination to advance research, standardization, and development of engineering and technology to improve our understanding of the brain to treat diseases and improve the human condition. IEEE Brain Initiative unites engineering and computing expertise across IEEE Societies and Councils relevant to neuroscience, and provides an avenue for IEEE to work with multiple constituencies in academia, industry and government to incubate and sponsor new activities, projects, and standards that facilitate bringing neurotechnology to market in an ethical and responsible manner. Visit the IEEE Brain web portal to learn more.

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IEEE Cloud Computing is now the IEEE Technical Committee on Cloud Computing. The community provides a forum for members to broaden professional contacts, facilitates information exchange, and stimulates the growth of research, education, and industry in cloud computing. Visit the IEEE TCCLD web portal to learn more.

Visit Web Portal

The IEEE Internet of Things is one of IEEE's important, multi-disciplinary, cross-platform Initiatives. The Internet of Things (IoT) is one of the most exciting technological developments in the world today and the global technical community is coalescing around the thought-leading content, resources, and collaborative opportunities provided by the IEEE IoT Initiative. Visit the IEEE Internet of Things web portal to learn more.

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The intersection of medicine, life sciences, physical sciences, and engineering is a rapidly growing field, producing benefits for humanity and offering meaningful career paths. The IEEE Life Sciences Community brings together engineers, computer scientists, life scientists, medical practitioners, and researchers to advance the application of engineering and technology to the life sciences. Visit the LSTC website to learn more.

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The Task Force on Rebooting Computing (TFRC), housed within IEEE Computer Society, is the new home for the IEEE Rebooting Computing Initiative. Founded in 2013 by the IEEE Future Directions Committee, Rebooting Computing has provided an international, interdisciplinary environment where experts from a wide variety of computer-related fields can come together to explore novel approaches to future computing. Visit the IEEE Rebooting Computing website to learn more.

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Check out the new IEEE PES Grid Edge Technologies Conference & Exposition coming in 2023. This conference aims to provide an international forum for experts to

promote, share, and discuss issues, solutions, and lessons learned working at the interface of the electric grid. Visit the Smart Grid website to learn more.

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IEEE Smart Cities brings together IEEE's broad array of technical societies and organizations to advance the state of the art for smart city technologies for the benefit of society and to set the global standard in this regard by serving as a neutral broker of information amongst industry, academic, and government stakeholders. Visit the Smart Cities website to learn more.

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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 in the eLearning modules.

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The IEEE Sustainable ICT initatitive's mission is to build a holistic approach to sustainability through ICT by incorporating green metrics through IEEE technical domains and seeks to foster the incorporation of green metrics and standards in design concepts for various technical domains. The initiative brings together expertise from different fields, in conferences and publications, with a view to foster holistic design and standardization approaches. Please join the IEEE Sustainable ICT Technical Community to help drive this very important topic.

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The IEEE Cybersecurity Initiative (CYBSI) is now the IEEE Computer Society's Technical Community on Security and Privacy (TCSP). Launched in 2014 by the IEEE Computer Society and the IEEE Future Directions Committee, TCSP's goal is to foster excellence in computer security and privacy research. Visit the TCSP website to learn more about this technical community's publications and sponsored conferences.

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The IEEE Transportation Electrification Community coordinates broad and deep activities throughout the IEEE in the growing electrification revolution across transportation domains, including advances in electric and hybrid cars, more-electric ships and aircraft, rail systems, personal transport, and the motive, storage, power grid, electronic intelligence, and control technologies that make them possible. Visit the TEC website to learn more.

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Open Call for Proposals

The IEEE Future Directions Committee (FDC) 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 perspectives on a particular topic, application, or technology. These projects range from short-term activities to reach a specific goal to Future Directions Initiatives seeking longer-term cross-collaborative engagement among industry, academia, and government striving to develop and deploy various future technologies.

You are welcome to submit new ideas via this form. For inquiries, contact IEEE Future Directions at ieee-fd@ieee.org.

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