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## An Overview of Future Directions



IEEE is “the world’s largest technical professional organization,” but technology and professional standards are constantly evolving. IEEE Future Directions (FD), formerly New Technology Connections, is IEEE’s main resource for emerging technologies.

The IEEE Future Directions Committee (FDC) identifies technologies as primary focus areas and establishes them as formal initiatives to engage with academia, industry, research, and government. This committee aims to identify, develop, and promote projects that bring value to IEEE and further the core mission to “foster technological innovation and excellence for the benefit of humanity.” The team is comprised of an exceptional group of hardworking professionals and would not be successful without the continued support from their dedicated volunteers and staff.

## Organizational Success and Efficiency

One of the key components for a successful, efficient organization is teamwork and collaboration. FD connects and fosters collaboration across multiple IEEE Societies and Councils and other Organizational Units to provide broad and deep perspectives on a variety of topics, applications, and technologies. These projects aim to develop and deploy various future technologies, and they range from short-term activities to longer-term cross-collaborative engagements among industry, academia, and government. To be successful and sustainable, IEEE Initiatives rely on dedicated volunteers to actively chair and take ownership of projects.

New initiatives follow a lifecycle from incubation to maturity. Once an initiative has completed its cycle, it is anticipated to enter a post-initiative phase, and later becomes a Graduated Initiative. [Graduating initiatives](#) may take several future paths.

## New Initiative Ideas and Suggestions



Check the IEEE Future Directions [New Technology Proposal List](#) to see if an idea has been considered or not, and if you don't see it on the list, you are welcome to submit new ideas via this [form](#). Through its committee and Industry Advisory Board, IEEE Future Directions has compiled and maintains a list of new technology areas that have been, or will be, considered. New areas that have been developed include

partnerships with Microsoft and Lockheed Martin around Future Directions activities.

If you are interested in learning more about IEEE Future Directions and potential volunteering opportunities, [click here](#) or contact [ieee-fd@ieee.org](mailto:ieee-fd@ieee.org).

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## 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](mailto:FDPolicyEthics@ieee.org). Learn more about submitting an article through the [author guidelines](#).

## Quantum Machine Learning-based Detection of Fake News and Deep Fake Videos

By **Saurabh Kamal**, *Engineering and Technology, Liverpool John Moores University United Kingdom*, **Vijay Kumar**, *Computer Science and Engineering, National Institute of Technology, Hamirpur, Himachal Pradesh, India*, and **Sahil Sharma**, *Computer Science and Engineering, Thapar Institute of Engineering and Technology, Patiala, India*

With the growth of multimedia technologies and Machine Learning (ML), it is becoming easier for individuals to create fake images/videos. Generative Adversarial Network (GAN) models are mainly used to generate accurate deepfakes, and then the fake content is distributed as news via the World Wide Web. Researchers are rapidly aiming to develop tools to combat the spread of false news, a major global threat. Fake content on major social media sites has had, and can have, real-world ramifications on people's opinions and actions. This may only be the start of a race to identify solid algorithms that can combat deceitful information. The primary goal of this study is to identify fake news and deepfakes by leveraging quantum machine learning, and then comparing the training time with a traditional neural network model.

[Read More](#)

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## Activities in Our Current Technical Communities



The 2022 IEEE 1st Global Emerging Technology Blockchain Forum on 7-11 November aims to bring experts from industry, academia, and research to exchange their vision as well as their achieved advances in Blockchain and DLT, and encourage innovative cross-domain studies, research, early deployment, and large-scale pilot showcases that address the challenges of Blockchain while identifying and investigating the possibilities of future Blockchain/DLT networks. This will be a hybrid event (virtual and in-person) in Southern California, USA. The Call for Papers deadline has been extended to 1 September 2022.

Visit the [IEEE Get Blockchain website](#) for details.

[Visit Web Portal](#)

IEEE Digital Privacy is a new Future Directions initiative dedicated to champion digital privacy for individuals. The IEEE Digital Privacy portal was recently launched to highlight current activities, resources, and opportunities for the privacy community. Latest offerings include an audio podcast series with privacy experts, on-demand videos, as well as resources in education, publications, and standards. We are currently seeking volunteers to participate in the initiative and grow the portfolio of program activities. Visit the [IEEE Digital Privacy portal](#) to learn more and get involved. Join us at the IEEE Global Emerging Technology Blockchain Forum in November for a special [symposium on Cybersecurity & Privacy](#).



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Learn more about the hot topic of the Metaverse. A two-part webinar was recently held with four experts who defined the Metaverse in their own terms and delved into potential use-cases for leveraging the Metaverse across a multitude of industries, including public services. Both are available on demand, [Mastering the Metaverse Across Industry Part 1](#) and [Mastering the Metaverse Across Industry Part 2](#).



Additionally, in partnership with Microsoft, listen to the special podcast on how Machine Teaching and Autonomous AI can help upskill communities beautifully articulated by Kence Anderson, Director of Autonomous AI Adoption at Microsoft. [Listen to the podcast](#).

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The Optics Working Group is hosting two webinars in August as part of the ongoing monthly webinar series to promote the [latest edition of its roadmap](#). The first is on 17 August on [Xhaul Optical, Transport and Synchronization Networks](#), hosted by Reza Vaez-Ghaemi of VIAVI Solutions.



The second is on 31 August on [Future In-Building Networks](#), hosted by Volker Jungnickel of Fraunhofer Institute for Telecommunications. The 2022 Future Networks World Forum (formerly 5G World Forum) is closing its technical paper application shortly and opening registration. Visit the [event website](#) for the latest information.

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Registration is now open for IEEE Quantum Week 2022. The [3rd IEEE International Conference on Quantum Computing and Engineering \(QCE22\)](#) will be held 18-23 September in Broomfield, CO, USA. To learn more about our flagship conference, visit the [QCE22 site](#).

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The Smart Lighting Project is co-sponsored the [17th International Symposium on the Science & Technology of Lighting LS17](#) which took place in Toulouse, France from 1-3 June, co-located with the 11th EEDAL conference. This event was hosted both virtually and in person. The conference was a great success and had 159 contributed papers in cutting-edge topics in Lighting Systems and Domestic Appliances Technology and 3 panel discussions.

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The LEO SATS project hosted their second exhibit during [IMS 22](#) in Clearwater, Florida last month. This activity allowed the project to acquire more volunteer interest from members and nonmembers. In an effort to attract more volunteers to get involved, there will also be more exhibit booths at events throughout 2022 and 2023.

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On 21 June at 7:00 am PST, Chair of the Telepresence Project, [Adrian Stoica](#) of NASA-JPL, sat on a panel with Tanja Rückert (Bosch CDO) and discussed Robotics, Autonomy, Telepresence, and AI, and the societal transformations caused by the confluence of these fields. This is a part of a "[Thought Leader Online Session Series](#)" hosted by Bosch.

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## IEEE Future Directions Events

### 2022 IEEE Symposium on Computer Security Foundations (CSF)

Haifa, Israel | 7-10 August 2022

### 2022 IEEE 10th International Conference on Smart Grid Engineering (SEGE)

Ontario, Canada | 10-12 August 2022

### 2nd Future Network Security: Challenges and Opportunities Workshop

Online | 23-25 August 2022

### IEEE Quantum Week 2022

Broomfield, Colorado, USA | 18-23 September 2022

### 2nd Systems Optimization Imperatives, Techniques, and Opportunities for Future Networks Workshop

Online | 19-20 September 2022

### IEEE 8th IEEE International Smart Cities Conference 2022 (ISC2)

Paphos, Cyprus | 26-29 September 2022

### 2022 IEEE Future Networks World Forum (FNWF)

Montreal, Quebec, Canada | 12-14 October 2022

### 2022 IEEE Secure Development Conference (SecDev)

Atlanta, GA, USA | 18-20 October 2022

### 2022 IEEE 1st Global Emerging Technology Blockchain Forum

Southern California, USA | 7-11 November 2022

### 2022 IEEE 2nd International Conference on Intelligent Reality (ICIR)

Online | 14-16 December 2022

## 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 to improve 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.

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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.

[Visit Web Portal](#)



[IEEE 8th IEEE International Smart Cities Conference 2022 \(ISC2\)](#) will be held 26-29 September in Paphos, Cyprus. The [ISC2 Call for Papers](#) has been extended to 31 May. Please visit the [ISC2 CFP page](#) for submission guidelines and important dates. Winners of the IEEE Smart Cities Award 2022 will showcase their successfully leveraged smart city technologies and innovation. To enter your project, or nominate a city or municipality, click [here](#).

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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 initiative'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](mailto:ieee-fd@ieee.org).

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### Subscribe to this Newsletter

Participants of current and graduated IEEE Future Directions technical communities 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

If you would like to read any of our past issues, you can [find them here](#).

### 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](mailto:ieeefd-digital@ieee.org).

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