IEEE Future Directions Newsletter

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Future Directions Small Projects

The Future Directions Committee has identified various technology areas that are currently in the "Small Project" phase. In this phase, each of the small projects is working towards the path of becoming an initiative in the near future. With volunteer leadership designated to each project, teams have been meeting regularly to ideate, build a framework, and rally the tech community (both internally and externally) on the respective area of focus. Three of the small projects are highlighted below: Smart Lighting, Telepresence, and Low Earth Orbit Satellites and Systems (LEO SatS).

Smart Lighting:
Smart Lighting fits perfectly with the IEEE mission for Advancing Technology for Humanity because artificial light generation is an inherent need of human beings and society. This project seeks to understand the interactions between the components of a complex SL system including the end-user behavior and evaluating the impacts on energy, environment and resources.

Telepresence:
The Telepresence small project aims to create a technical community to facilitate cross-disciplinary collaboration and coordination to advance research, standardization, and development of engineering and technology to advance the development of telepresence and to facilitate its integration in products and services improving work productivity, enabling remote work with high conditions of human supervision, emphasizing human-oriented added value and increasing quality of life.

[Low Earth Orbit Satellites and Systems:](#)
This small project consolidates various distributed LEO SatS activities and provides a focus on education and awareness. The intended impact of this small project is to:
1. Attract high-quality university and college students to IEEE through the collaboration with young and seasoned professionals.
2. Attract talented high-school students to provide them with the activities that they would not have otherwise.
3. Increase cooperation in LEO SatS between professionals in academia, industry, military, and government.

Technology, Policy and Ethics

[IEEE Future Directions Technology, Policy and Ethics](#) publishes articles addressing issues in current and future technologies, including the social and ethical considerations. We are currently seeking submissions of original content, articles of 800-1200 words on the 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](#).

Detecting False rRT-PCR COVID-19 Test Reports Using Deep Learning Algorithms

Muhammad Naveed Younis, *Department of Computer Science, The University of Lahore, Lahore, Pakistan*, Ali Raza, *Department of Computer Science, University of Engineering and Technology, Taxila, Pakistan*, Syed Hashim Raza Bukhari, *SMIEEE, Department of Electrical and Computer Engineering, CUI, Attock Campus, Pakistan*

The novel coronavirus (COVID-19) is a disease that has shattered the entire world. Catastrophic impacts are being observed upon family and social life, education, global supply chain, health care facilities, and the economy. Most importantly, it has infected millions of people and wasted many precious lives, and these numbers are increasing exponentially.

To reduce the spread and save lives, people need an accurate and speedy method to diagnose the disease. The World Health Organization (WHO) recommends a real-time Reverse Transcription-Polymerase Chain Reaction (rRT-PCR) test. In addition to the capabilities to produce rapid results for detecting the coronavirus, rRT-PCR tests can generate false reports. To overcome this flaw, we proposed a Deep Learning (DL)-based False Report Detection Model. The proposed model takes the input of a suspect's symptoms, as well as the rRT-PCR test results, and then classifies the test report either as false or accurate.

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CARD Predictive Model: COVID-19 in India

Sougata Mazumder, Debjit Majumder, Prasun Ghosal, *Indian Institute of Engineering Science and Technology, Shibpur*

Predictive models play a vital role in tackling COVID-19, and the usage varies across industries. The dynamic nature of models allows for analysis of the current situation, and in turn, the development of forecasts and predictions for the near future. These models are essential tools for healthcare experts and government stakeholders making decisions based on data. The importance of predictive models increases exponentially for developing, low-

middle income countries, such as India, that have a high population density and a high percentage of citizens living below the poverty line. For socioeconomic stability, it is essential for COVID-19 management to leverage predictive models such as the Confirmed-Active-Recovered-Death (CARD) model. In this article, we will discuss models holistically, with a special focus on the CARD Model, which presents time-varying equations to help predict the ongoing situation, regarding coronavirus, using tools like regression, curve fitting, etc.

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Digital Transformation and Cybersecurity in the Context of COVID-19 Proliferation

Yassine Maleh, *IEEE Senior member, University Sultan Moulay Slimane, Beni Mellal, Morocco*

The coronavirus pandemic has given a powerful impetus to the mass adoption of digital technologies, which will bring unprecedented changes in the social and economic fabric of our society. More than ever, the digitalization of companies is accelerating. This is reflected in the massive dematerialization of information systems towards the cloud, the explosion of the Internet of Things, and the accumulation of data from users in Big Data. The ongoing measures of social exclusion in most countries of the world have forced a large part of the world's trade, in terms of goods and services, to go online. Soon, the world is likely to see further explosive growth in the capitalization of online service providers as commodity companies decline. At the same time, these openings are opportunities for companies to deploy innovative and more efficient services.

Nevertheless, this transformation must be secured by more rigorous personal data protection to install digital trust among users, especially as cyber-attacks related to digital transformation are multiplying. It may be possible to focus only on technological elements following the still all-too-common belief that adding a new "trendy" security tool is enough to solve IT security problems. However, in reality, cybersecurity involves an intangible triptych: technology, process, and human factor.

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The New Normal using Top-Notch Technologies: Artificial Intelligence & Quantum

Ankita, Cherry Mangla, Shalli Rani (IEEE Senior Member), *Chitkara University Institute of Engineering and Technology, Chitkara University, Rajpura-140401, Punjab, India*

A variety of technologies such as Artificial Intelligence (AI), Data Science, Machine Learning (ML), Deep Learning (DL), Quantum Process (QP), and Quantum Dots (QD) have been leveraged to help humans better understand the ongoing Coronavirus pandemic. This virus, which was first reported in 2019 in Wuhan, China, has affected many countries. The increasingly rapid spread of this virus has had a huge impact on people physically, emotionally, and financially. Countries across the globe have faced huge problems resulting from COVID-19. Specifically, countries that have dense populations, such as India and China, have faced even more challenges resulting and worsened from the virus, such as hunger and unemployment, which has further threatened peoples lives. However, many countries are gradually progressing to enhance their healthcare industry by implementing all of the latest technologies in order to reduce the spread of the disease, and in hopes of developing a cure. In this battle of life and death, science plays a major role.

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# Activities in Our Current Technical Communities

Blockchain Local Groups are being formed worldwide to bring together experts and provide networking opportunities for attendees working on blockchain projects. Save the dates for upcoming virtual seminars, the IEEE Americas Blockchain Seminar on 21 October 2021, and the IEEE Asia-Pacific Blockchain Event on 23-24 November 2021. Additional details, including topics and invited speakers, will be available soon.

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Join the free upcoming IEEE Healthcare Summit: Integrating BHI and AI to Combat Pandemics on 4-7 October 2021. This event aims to report progress made in the fight against COVID-19 and in better preparations for future pandemics through the integration of Artificial Intelligence (AI) methods and tools with Biomedical and Health Informatics (BHI). Don't miss your chance to attend the upcoming live Digital Reality webinars. On 19 October 2021, Dr. Styliani Kleanthous will discuss AI Biases and Inclusions and share recent work in analyzing proprietary image tagging services for their gender and racial biases when tagging images/depicting people.

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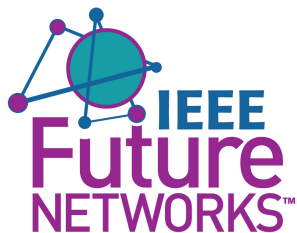
Registration is now open for the 2021 IEEE 5G World Forum, happening live from 13-15 October. The premiere Future Networks Initiative event will be fully virtual again this year. After the world forum, join the latest INGR webinar on 20 October, Connecting the Unconnected: To Bridge the Digital Divide, which goes into the current status of the CTU landscape and where we want to reach to accomplish the vision of connecting everybody. The Future Networks 1st Massive MIMO Workshop, happening from 8-10 November, will focus on latest developments in Massive MIMO challenges and opportunities—from fundamental research, experimental results, and system architecture to industry applications.

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Registration is open for IEEE Quantum Week 2021 — the 2nd IEEE International Conference on Quantum Computing

and Engineering (QCE21). IEEE Quantum Week is the leading multidisciplinary venue featuring quantum research, practice, applications, education, and training. This premier event will be held virtually on 17-22 October 2021. Register now to reserve your seat!

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Activities in Our Graduated Technical Communities

The IEEE Brain Neuroethics Subcommittee is developing a neuroethical framework for evaluating the ethical, legal, social, and cultural issues that may arise with the deployment of neurotechnologies. Learn more about the IEEE Neuroethics Framework and provide your feedback or download the latest version.

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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 Security Development Conference (SecDev2021), a venue for presenting ideas, research, and experience about how to develop secure systems, is scheduled for 18-20 October. This virtual event is currently accepting submissions for papers, tutorials, practitioner submissions and posters. Visit the SecDev2021 site for more details and deadlines.

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The *IEEE Internet of Things Magazine* (IEEE IoTM) publishes high-quality articles on IoT technology and end-to-end IoT solutions. IoTM articles are written by and for practitioners and researchers interested in practice and applications, and selected to represent the depth and

breadth of the state of the art. Visit the IoTM website to learn more, subscribe, and view upcoming calls for papers.

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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 2021 Low-Power Computer Vision Challenge (2021 LPCVC) took place in August; winners will present their solutions during the ICCV workshop in October 2021. Register for the 2021 IRDS™/IEEE International Nanodevices & Computing (INC) Conference for on-demand content, and register for the IEEE International Conference on Rebooting Computing (ICRC 2021), the premier venue for computing research, on 30 November - 2 December. The 2022 IEEE Autonomous Unmanned Aerial Vehicles (UAV) Competition, a competition of autonomous UAVs, will be held in April 2022 at Purdue's UAV Research and Test Facility (PURT).

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Check out the latest panel discussion with industry experts, Modernizing and Preparing the Grid for Decarbonization - available on the IEEE Smart Grid Resource Center.

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Did you miss the International Smart Cities Conference (ISC2)? Content is available to stream (tutorials, workshops, keynotes, panels and more) on the IEEE Smart Cities Resource Center!

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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 Transportation Electrification Community September 2021 Newsletter is Now Available! This issue includes several articles from the Co-Editor-in-Chiefs, JinWoo Ahn and Sheldon Williamson. View all of the articles, including *MIT Solar Electric Vehicle Team: Continuous Innovation and Next Steps After the Pandemic, Ontario Tech Racing, Self-Made Automotive Competition for Korean University Students,* and more.

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IEEE Future Directions Events

- IEEE Digital Privacy Workshop
  7-8 October 2021, Online
- 2021 IEEE 5G World Forum (5GWF'21)
  13-15 October 2021, Online
- 2021 IEEE International Conference on Quantum Computing and Engineering (QCE)
  17-22 October 2021, Online
- 2021 IEEE Secure Development Conference (SecDev)
  18-20 October 2021, Online
- IEEE Smart Lighting Workshop
  19 October 2021, Online

- IEEE Americas Blockchain Seminar
  21 October 2021, Online
- Connecting the Unconnected Summit
  3-5 November 2021, Online
- IEEE Low-Earth-Orbit Satellites & Systems Workshop
  4-5 November 2021, Online
- Future Networks 1st Massive MIMO Workshop
  8-10 November 2021, Online
- IEEE Asia-Pacific Blockchain Virtual Event
  23-24 November 2021, Online
- 2021 International Conference on Rebooting Computing (ICRC)
  30 November - 2 December 2021, Online

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