Editorial: Special Issue on "Massive Information by a Plethora of Devices (AIMS)"*

Ramjee Prasad

Department of Business Development and Technology, Birk Centerpark 15, 8001, CGC, INNOVATORIUM 7400, Herning, Denmark
E-mail: ramjee@btech.au.dk

The 26th Edition of Strategic Workshop (SW'23) was held on October 25–27, 2023 in Croatia. During the active 3-day discussion, the workshop centred on the theme "Massive Information by a Plethora of Devices (AIMS),", presenting the concept, intelligent discoveries, digital technology-oriented business models, proposals for sustainability solutions & global partnership. The Workshop also discussed the challenges and opportunities arising from the vast amounts of data generated by the proliferation of connected devices in today's interconnected world and the project proposal talks in the relevant area.

The theme of the Workshop was "Massive Information by a Plethora of Devices (AIMS)". In addition to the technical presentations on AIMS, the primary goal of the strategic workshop was to highlight the transformative potential of 6G and emerging technologies in addressing critical challenges associated with big data, device design, connectivity, and sustainability The increasing adoption of IoT devices has introduced complexities in data processing and analysis, raising concerns about privacy, security, and data access control. We also discussed that the future device ecosystems must prioritize eco-friendly design and recycling strategies to minimize environmental impact. Connectivity, powered by advancements in 6G, emerged as

*Chosen Topics from the Strategic Workshop October 25–27, 2023.

the critical enabler for integrating and optimizing these vast networks of devices.

We created a dedicated Panel and Sessions in Massive Information by a Plethora of Devices (AIMS) to serve the above purpose The Workshop emphasized that for a clear vision and collective negotiation among stakeholders, local population, and business associations for developing transparency in policies and communication for mutual partnerships and healthy competition throughout the globe to achieve the goal of managing massive information and connected devices effectively.

The Special Issue presents seven selected papers that emphasize a wide range of scientific studies in Massive Information by a Plethora of Devices (AIMS) and provides an overview of the innovations and collaborative efforts shaping the next generation of connectivity and data-driven solutions.

The First Paper, "Downlink Power Allocation with Stackelberg Game in NOMA System", by Chih-Cheng Tseng, Yao-Jen Liang, Hwang-Cheng Wang, Chi-Han Chen, and Fang-Chang Kuo.

This paper explores the application of Non-Orthogonal Multiple Access (NOMA) in 5G mobile communications by introducing a Stackelberg game pricing mechanism for downlink power allocation. It also provides a comparative analysis and evaluates the performance of the proposed scheme compared to the existing methods.

The Second Paper, "Leveraging Massive Information from Diverse Devices: An Intelligent, Low-Cost, Voice-Controlled Autonomous Wheelchair for Enhanced Mobility", by Asim Sattar, Sayed Mazhar Ali, Bhawani Shankar Chowdhry, Mushtaque Ahmed Rahu and Sarang Karim.

To enhance the mobility for individuals with disabilities, this paper presents the development of an intelligent, low-cost, voice-controlled autonomous wheelchair. The study covers the design, fabrication, and performance testing, highlighting features like optimal speed, load capacity, and obstacle avoidance and also discusses the potential limitations and future enhancements.

The Third Paper, "Cultural Heritage Monitoring and Predictive Maintenance using Internet of Things:

Assessment and Future Aspects", by Um-e-Habiba, Faisal Karim Shaikh, and Bhawani Shankar Chowdhry.

This paper is a survey on the use of the Internet of Things (IoT) for predictive maintenance and monitoring of cultural heritage, focusing on museums and exhibitions. It explores how IoT devices and predictive algorithms improve heritage conservation, visitor experiences, and maintenance

strategies and highlights key technologies, hazard detection capabilities, and future research directions in cultural heritage monitoring.

The Fourth Paper, "Models prediction and estimation of ENSO and Karachi Rainfall cycles through AR-GARCH and GARCH Process", by Asma Zaffar, Rizwan Khan, Nimra Malik, Muhammad Amir, Vali Uddin and Muhammad Asif.

This study analyses the impact of El Niño-Southern Oscillation (ENSO) on Karachi's rainfall patterns from 1961 to 2021, focusing on 10 distinct cycles. It evaluates the volatility and predictive accuracy of AR(R) – GARCH (P, Q) and GARCH (P, Q) Models using statistical techniques and comparative analysis.

The Fifth Paper, "Forecasting Karachi's Air Temperature Variation: Leveraging Mobile and Multimedia Dataset for Global Warming Insights", by Asma Zaffar, Shakil Ahmed, Aysha Rafique, Muhammad Imran, Muhammad Amir and Vali Uddin.

This paper examines the impact of Karachi's transport and building industries on CO2 and greenhouse gas emissions by analyzing 60 years of monthly maximum and minimum air temperatures (1961–2020). It highlights the correlation between air temperature trends and global warming effects and provides valuable insights for understanding and mitigating climate change.

The Sixth Paper, "Massively Flexible Mobile Systems", by Andre Perdigao, Jose Quevedo, Daniel Corujo and Rui Aguiar.

This paper examines the capability of 5G networks to support massive Machine Type Communications (mMTC) for emerging IoT use cases. While full mMTC features are not yet available, several 5G features are already standardized and included in commercial-graded 5G networks. The study explores these features, showing how current 5G networks can address future mMTC demands

Prof. Dr. Ramjee Prasad, Fellow IEEE, IET, IETE, and WWRF, is a Professor Emeritus of Future Technologies for Business Ecosystem Innovation (FT4BI) in the Department of Business Development and Technology, Aarhus University, Herning, Denmark. He is the Founder President of the CTIF Global Capsule (CGC). He is also the Founder Chairman of the Global ICT Standardization Forum for India, established in 2009.

He has been honoured by the University of Rome "Tor Vergata," Italy as a Distinguished Professor of the Department of Clinical Sciences and Translational Medicine on March 15, 2016. He is an Honorary Professor at the University of Cape Town, South Africa, and the University of KwaZulu-Natal, South Africa, and also an Adjunct Professor at Birsa Institute of Technology, Sindri, Jharkhand, India.

He has received Pravasi Bhartiya Samman Puraskaar (Emigrant Indian Honor Award by the Indian President) on January 10, 2023 in Indore. He has received the Ridderkorset of Dannebrogordenen (Knight of the Dannebrog) in 2010 from the Danish Queen for the internationalization of top-class telecommunication research and education. He has received several international awards such as the IEEE Communications Society Wireless Communications Technical Committee Recognition Award in 2003 for making a contribution in the field of "Personal, Wireless and Mobile Systems and Networks," Telenor's Research Award in 2005 for impressive merits, both academic and organizational within the field of wireless and personal communication, 2014 IEEE AESS Outstanding Organizational Leadership Award for: "Organizational Leadership in developing and globalizing the CTIF (Center for TeleInFras- truktur) Research Network," and so on.

He has been the Project Coordinator of several EC projects, namely, MAGNET, MAGNET Beyond, eWALL.

He has published more than 50 books, 1000 plus journal and conference publications, more than 15 patents, over 150 Ph.D. Graduates and a larger number of Masters (over 250). Several of his students are today's worldwide telecommunication leaders themselves.

Under his leadership, magnitudes of close collaborations are being established among premier universities across the globe. The collaborations are regulated by guidelines of the Memorandum of Understanding (MoU) between the collaborating university.