

# IEEE Transactions on Consumer Electronics

## Call for Papers

### Special Section on “Split Learning in Consumer Electronics for Smart Cities: Theories, Tools, Applications and Challenges”

#### Theme:

As the Internet of Things (IoT) industry grows, so do the opportunities to utilize services and encounter different threats. The process of sensing and collecting data to provide services to end users go through multiple computational, security and other challenges. Moreover, the quality of the collected data is central to correct control and optimal evaluation. With rapid technological development in consumer electronics (CE) for smart cities, the efficient and sustainable demands have broaden the scope of ubiquitous sensing, advanced computing technologies for prediction, monitoring and data sharing. Recent tools and platforms have made possible many previously unimaginable applications and services yet have introduced tremendous challenges in terms of security, trust and services. In the artificial intelligence (AI) based IoT paradigm, the CE for smart cities demand high resource efficiency for different smart systems such as; smart healthcare, transport, AI empowered sensing (AleS) and sustainable networks. The number of different machine learning algorithms and deep learning techniques is continuously evolving and developing in terms of the continuous progress of technology. In this context, the new distributed deep learning technique called Split learning can significantly reduce the challenges related to smart services.

As data security and resource efficiency are the main concerns for smart city services, split learning can play an important role with its unique working principle. Split enables the training of deep neural networks or split neural networks (SplitNN) with AleS to train over multiple data sources without sharing the raw labelled data directly. This, in turn, improves data security, which effectively helps CE for smart cities applications, such as healthcare, finance, security, surveillance and others where data sharing is prohibited. This Special Issue (SI) impetus is to provide practitioners and researchers interested in security and services over split learning techniques for next-generation smart cities. Additionally, the Special Issue solicits discussions of best practices of the latest innovations and services of AI in the domain of secured systems for future CE applications.

#### Topics of interest in this Special Section include (but are not limited to):

- Split learning and Federated Learning based trust management for AleS in the next-generation CE for smart cities
- Split learning for future services with improved data acquisition and massive connectivity in CE
- Protocols for secure data transmission in Split learning in CE applications
- Novel business models for Split learning in CE for smart cities
- Security and enhanced privacy-aware system over Split learning in CE
- Novel applications for reliable and sustainable Split learning and Federated Learning
- Distributed ledger technology and Split Learning in CE
- Robust AI and DL methods for resource-constrained devices used in CE
- Split learning-based enhanced services for intelligent transportation system in CE for smart cities
- Split learning Techniques in smart healthcare
- Postquantum era and Split Learning for Smart cities
- Split learning-based Financial ecosystem for Smart cities
- Neuro-finance and Split Learning
- Self-diagnostic and self-healing techniques in CE
- Agile techniques and protocols for Split learning in CE
- Challenges and solutions towards Split learning in CE for smart cities

#### Important dates:

- End of submission of Manuscripts: 30 September 2023
- Expected publication date (tentative): Second Quarter 2024

#### Guest Editors:

- ♦ **Dr. Amrit Mukherjee (Leading Guest Editor), SMIEEE**  
Department of Computer Science, Faculty of Science, University of South Bohemia, Czech Republic, Email:  
[amrit1460@ieee.org](mailto:amrit1460@ieee.org), [amukherjee@jcu.cz](mailto:amukherjee@jcu.cz)

Editor-in-Chief: Dr. Kim Fung Tsang

[kf.tce.eic@gmail.com](mailto:kf.tce.eic@gmail.com)

- ♦ **Dr. Pushpita Chatterjee, SMIEEE**, Department of EE&CS, Howard University, Washington DC, USA Email: [pushpita.c@ieee.org](mailto:pushpita.c@ieee.org), [puspita.chatterjee@howard.edu](mailto:puspita.chatterjee@howard.edu)
- ♦ **Prof. Amir H. Gandomi, SMIEEE**, Professor of Data Science, University of Technology, Sydney, Australia, Email: [Gandomi@uts.edu.au](mailto:Gandomi@uts.edu.au)
- ♦ **Prof. Rudolf Vohnout**, Department of Computer Science, Faculty of Science, University of South Bohemia, Czech Republic, E-mail: [rudolf.vohnout@prf.jcu.cz](mailto:rudolf.vohnout@prf.jcu.cz)

#### Instructions for authors:

Manuscripts should be prepared following guidelines at: <https://ctsoc.ieee.org/publications/ieee-transactions-on-consumer-electronics.html> and must be submitted online following the IEEE Transactions on Consumer Electronics instructions: <https://ctsoc.ieee.org/publications/ieee-transactions-on-consumer-electronics.html>. During submission, the Special Section on **“Split Learning in Consumer Electronics for Smart Cities: Theories, Tools, Applications and Challenges”** should be selected.