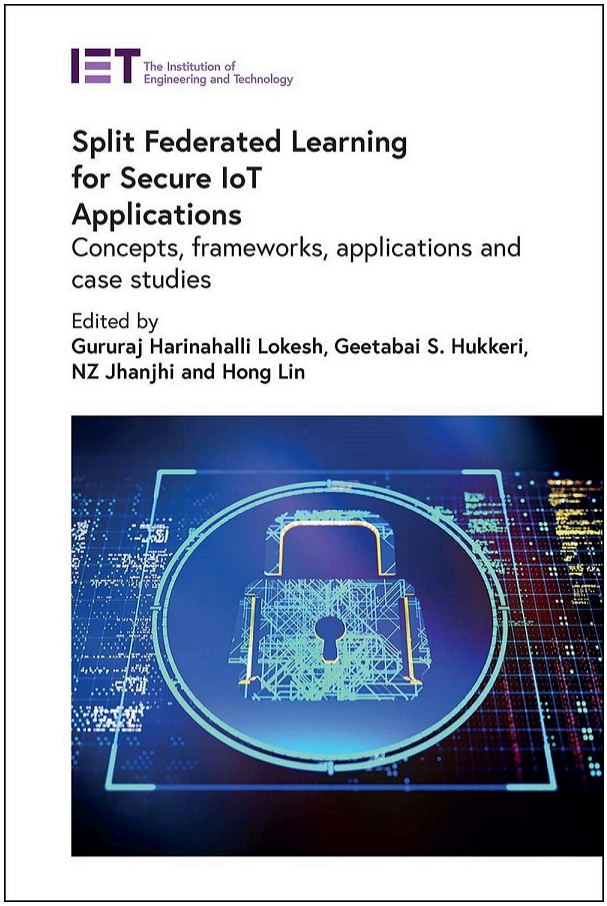

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Split Federated Learning for Secure IoT Applications

Concepts, frameworks, applications and case studies

Edited by Gururaj Harinahalli Lokesh, Geetabai S. Hukkeri, N.Z. Jhanjhi, Hong Lin

New approaches in federated learning and split learning have the potential to significantly improve ubiquitous intelligence in internet of things (IoT) applications. In split federated learning, the machine learning model is divided into smaller network segments, with each segment trained independently on a server using distributed local client data.

The split learning method mitigates two fundamental drawbacks of federated learning: affordability, and privacy and security. When running machine learning computation on devices with limited resources, assigning only a portion of the network to train at the client-side minimizes the processing burden, compared to running a complete network as in federated learning. In addition, neither client nor server has full access to the other, which is more secure.

This book reviews cutting edge technologies and advanced research in split federated learning. Coverage includes approaches to realizing and evaluating the effectiveness and advantages of federated learning and split-fed learning, the role of this technology in advancing and securing IoTs, advanced research on emerging AI models for preserving the privacy of the data owned by the clients, and the analysis and development of AI mechanisms in IoT architectures and applications. The use of split federated learning in natural language processing, recommendation systems, healthcare systems, emotion detection, smart agriculture, smart transportation and smart cities is discussed.

Split Federated Learning for Secure IoT Applications: Concepts, frameworks, applications and case studies offers useful insights to the latest developments in the field for researchers, engineers and scientists in academia and industry, who are working in computing, AI, data science and cybersecurity with a focus on federated learning, machine learning and deep learning.

About the Editors

Gururaj Harinahalli Lokesh is an associate professor in the Department of Information Technology and the founder of the Wireless Internetworking Group (WiNG) at the Manipal Institute of Technology, Bengaluru, India. His research interests include blockchain technology, cyber security, wireless sensor networks, ad-hoc networks, IoT, data mining, cloud computing and machine learning. He is an editorial board member of the *International Journal of Blockchains and Cryptocurrencies*. He has published over 110 research papers in international journals and presented 20 papers at international conferences. He is a senior member of the IEEE, lifetime member of ISTE and CSI, a professional member of the ACM and an ACM distinguished speaker. He holds a PhD degree in Computer Science and Engineering from Visvesvaraya Technological University, Belagavi, India.

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