Ultra-Dense Networks for 5G and Beyond: Modelling, Analysis, and Applications
Trung Q. Duong (Editor), Xiaoli Chu (Editor), Himal A. Suraweera (Editor)

Hardcover 978-1-119-47369-5 April 2019 $135.00

DESCRIPTION

Offers comprehensive insight into the theory, models, and techniques of ultra-dense networks and applications in 5G and other emerging wireless networks

The need for speed—and power—in wireless communications is growing exponentially. Data rates are projected to increase by a factor of ten every five years—and with the emerging Internet of Things (IoT) predicted to wirelessly connect trillions of devices across the globe, future mobile networks (5G) will grind to a halt unless more capacity is created. This book presents new research related to the theory and practice of all aspects of ultra-dense networks, covering recent advances in ultra-dense networks for 5G networks and beyond, including cognitive radio networks, massive multiple-input multiple-output (MIMO), device-to-device (D2D) communications, millimeter-wave communications, and energy harvesting communications.

Clear and concise throughout, Ultra-Dense Networks for 5G and Beyond - Modelling, Analysis, and Applications offers a comprehensive coverage on such topics as network optimization; mobility, handoff control, and interference management; and load balancing schemes and energy saving techniques. It delves into the backhaul traffic aspects in ultra-dense networks and studies transceiver hardware impairments and power consumption models in ultra-dense networks. The book also examines new IoT, smart-grid, and smart-city applications, as well as novel modulation, coding, and waveform designs.

• One of the first books to focus solely on ultra-dense networks for 5G in a complete presentation
• Covers advanced architectures, self-organizing protocols, resource allocation, user-base station association, synchronization, and signaling

• Examines the current state of cell-free massive MIMO, distributed massive MIMO, and heterogeneous small cell architectures

• Offers network measurements, implementations, and demos

• Looks at wireless caching techniques, physical layer security, cognitive radio, energy harvesting, and D2D communications in ultra-dense networks

*Ultra-Dense Networks for 5G and Beyond - Modelling, Analysis, and Applications* is an ideal reference for those who want to design high-speed, high-capacity communications in advanced networks, and will appeal to postgraduate students, researchers, and engineers in the field.

---

**ABOUT THE AUTHOR**

**TRUNG Q. DUONG, P HD**, is a Reader at Queen's University Belfast, UK, and is currently serving as an Editor for *IEEE Transactions on Wireless Communications* and *IEEE Transactions on Communications*.

**XIAOLI CHU, P HD**, is a Reader at the University of Sheffield, UK, and is an Editor for the *IEEE Wireless Communications Letters* and the *IEEE Communications Letters*.

**HIMAL A. SURaweERA, P HD**, is a Senior Lecturer at the University of Peradeniya, Sri Lanka, and serves as an Editor of the *IEEE Transactions on Wireless Communications*, *IEEE Transactions on Communications* and *IEEE Transactions on Green Communications and Networking*.

---

To purchase this product, please visit [https://www.wiley.com/en-us/9781119473695](https://www.wiley.com/en-us/9781119473695)