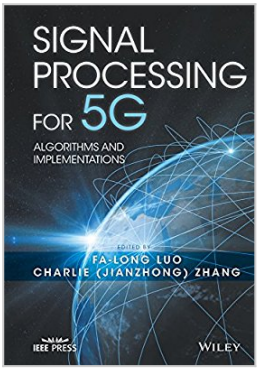

Signal Processing for 5G: Algorithms and Implementations (Wiley - IEEE)

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A comprehensive and invaluable guide to 5G technology, implementation and practice in one single volume. For all things 5G, this book is a must-read.

Signal processing techniques have played the most important role in wireless communications since the second generation of cellular systems. It is anticipated that new techniques employed in 5G wireless networks will not only improve peak service rates significantly, but also enhance capacity, coverage, reliability , low-latency, efficiency, flexibility, compatibility and convergence to meet the increasing demands imposed by applications such as big data, cloud service, machine-to-machine (M2M) and mission-critical communications.

This book is a comprehensive and detailed guide to all signal processing techniques employed in 5G wireless networks. Uniquely organized into four categories, New Modulation and Coding, New Spatial Processing, New Spectrum Opportunities and New System-level Enabling Technologies, it covers everything from network architecture, physical-layer (down-link and up-link), protocols and air interface, to cell acquisition, scheduling and rate adaption, access procedures and relaying to spectrum allocations. All technology aspects and major roadmaps of global 5G standard development and deployments are included in the book.
Key Features:

- Offers step-by-step guidance on bringing 5G technology into practice, by applying algorithms and design methodology to real-time circuit implementation, taking into account rapidly growing applications that have multi-standards and multi-systems.
- Addresses spatial signal processing for 5G, in particular massive multiple-input multiple-output (massive-MIMO), FD-MIMO and 3D-MIMO along with orbital angular momentum multiplexing, 3D beamforming and diversity.
- Provides detailed algorithms and implementations, and compares all multicarrier modulation and multiple access schemes that offer superior data transmission performance including FBMC, GFDM, F-OFDM, UFMC, SEFDM, FTN, MUSA, SCMA and NOMA.
- Demonstrates the translation of signal processing theories into practical

solutions for new spectrum opportunities in terms of millimeter wave, full-duplex transmission and license assisted access.

- Presents well-designed implementation examples, from individual function block to system level for effective and accurate learning.
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Editorial Review

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Dr. Fa-Long Luo is an IEEE Fellow and the Chief Scientist of two leading international companies, headquartered in Silicon Valley, dealing with software-defined radio and wireless multimedia. He is also an Affiliate Full Professor at the University of Washington. From 2007 to 2011, he was the founding editor-in-chief of the International Journal of Digital Multimedia Broadcasting. From 2011 to 2012, he was the chairman of the IEEE Industry DSP Standing Committee and technical board member of the IEEE Signal

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