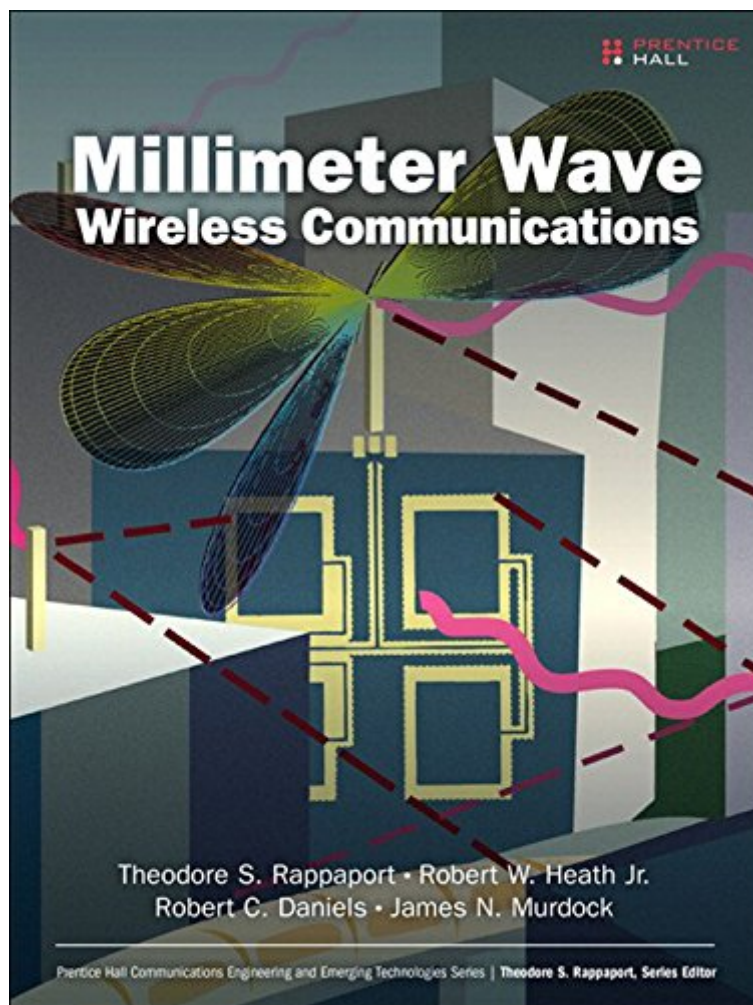# Millimeter Wave Wireless Communications (Prentice Hall Communications Engineering And Emerging Technologies Series From Ted Rappaport)

Synopsis

The Definitive, Comprehensive Guide to Cutting-Edge Millimeter Wave Wireless Design   â œThis is a great book on mmWave systems that covers many aspects of the technology targeted for beginners all the way to the advanced users. The authors are some of the most credible scholars I know of who are well respected by the industry. I highly recommend studying this book in detail.â • â ”Ali Sadri, Ph.D., Sr. Director, Intel Corporation, MCG mmWave Standards and Advanced Technologies   Millimeter wave (mmWave) is todayâ ™s breakthrough frontier for emerging wireless mobile cellular networks, wireless local area networks, personal area networks, and vehicular communications. In the near future, mmWave applications, devices, and networks will change our world. Â¿ In   Millimeter Wave Wireless Communications,   four of the fieldâ ™s pioneers, including Theodore S. Rappaport, Robert W. Heath, Robert C. Daniels, and James N. Murdock, draw on their vast experience to empower engineers at all levels to succeed with mmWave. They deliver fundamental, end-to-end coverage of all aspects of future mmWave wireless communications systems. Â¿ The authors explain new multi-Gigabit per second products and applications, mmWave signal propagation, analog and digital circuit design, mmWave antenna designs, and current and emerging wireless standards. They cover comprehensive mmWave wireless design issues for 60 GHz and other mmWave bands, from channel to antenna to receiver, introducing emerging design techniques that will be invaluable for research engineers in both industry and academia. Â¿ Topics include   Digital communication: baseband signal/channel models, modulation, equalization, error control coding, multiple input multiple output (MIMO) principles, and hardware architectures   Radio wave propagation characteristics: indoor and outdoor channel models and beam combining   Antennas/antenna arrays, including on-chip and in-package antennas, fabrication, and packaging   Analog circuit design: mmWave transistors, fabrication, and transceiver design approaches   Baseband circuit design: multiâ œgigabit-per-second, high-fidelity DAC and ADC converters   Physical layer: algorithmic choices, design considerations, and impairment solutions; and how to overcome clipping, quantization, and nonlinearity   Higher-layer design: beam adaptation protocols, relaying, multimedia transmission, and multiband considerations   60 GHz standardization: IEEE 802.15.3c for WPAN, Wireless HD, ECMA-387, IEEE 802.11ad, Wireless Gigabit Alliance (WiGig)

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Customer Reviews

High Frequency wireless (millimeter wave) can deliver speeds well into the gigabits. At millimeter wavelengths you can aggregate hundreds of MHz of spectrum compared to the 20 MHz typical of today's wireless networks. High frequency antennas are very small, so it's practical to put 50 of them on a chip for massive MIMO.Rappaport, Heath and colleagues are world leaders in research in millimeter wave high frequencies and MIMO. Rappaport's NYU Wireless Center has been sending teams out to get empirical data on frequencies like 28 GHz. They are testing in two of the toughest locations for a wireless network: Manhattan and Downtown Brooklyn. Heath at the University of Texas built one of the first MU MIMO testbeds.With literally $billions going into 5G wireless research you need the latest information and best sources. Many of the claims in traditional wireless textbooks are not proving out in empirical testing. This book is current & well-informed and likely to be the standard for years if the authors' issue regular updates. It's a technical book and not easy reading for non-engineers but the style is clear and the explanations well written.For the record, I'm a technology writer who has interviewed two of the authors. Rappaport was part of a webinar I did fpr the Marconi Society.

Just as FCC opens the issue of mobile use in the millimeter (mmW) wave region with the NOI in

Docket 14-177, we have the 1st major text book on the technology involved.In some ways this book is reminiscent of the pioneering 1976 publication of Robert Dixonâ ™s Spread Spectrum Systems with Commercial Applications. At the time Dixonâ ™s book was published there were published articles on most aspects of spread spectrum/CDMA technology, but they were scattered other a lot of different journals, often with different jargon, nomenclatures, and symbology in equations. While Dixon had few equations, he tied all the concepts together in a single approachable book. Similarly, but at a higher technical level, this book ties together its subject matter in a consistent way from a variety of sources, although in this case the authors are themselves major pioneers themselves in this technology.The book deals with mobile millimeter wave systems, focusing on base station/mobile uplinks and downlinks. There is little specifically on fixed systems although much of the content is application to both fixed and mobile.But the people who have to draft comments in Docket 14-177 and those who will be designing mmW mobile systems needs not be concerned absence of information on fixed or satellite systems. Within its prime subject matter of CMRS uplinks/downlinks it ties together for the first time information in disparate issues such as â ¢multipath mobile mmW propagation, â ¢atmospheric effects â ¢antenna technology including adaptive antenna technology to overcome the multipath, â ¢mmW device technology, and â ¢high level design issuesIt is a major contribution in the mobile area. I hope the next edition deals with fixed issues also, although much of the content is applicable to both.

Like the previous "Wireless Communications: Principles and Practice" by the same author, these two books are very very great (the most recommended) for graduate students, engineers, researchers ... in Wireless Communication. I love the most is that the author explains everything in a clear, systematic manner, and visions/suggestion how this field will be in the future... so many people can understand (not only professors).However, like me, many people after graduated (Bachelor, Master, Ph.D.) in this field, then working in industry. So I am looking for books which more practical, implementation (Signal Processing, Hardware, Circuit, RF....). Since the author has a super broad experiences, working in both academy and industry, I hope the author write books: interdisciplinary from principles of wireless to hardware implementation, System on Chip, antenna on chip... That would help many people.

Great book for reference or for reading cover to cover. Dr. Rappaport explains difficult subject matter in a clear and consise manner.

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