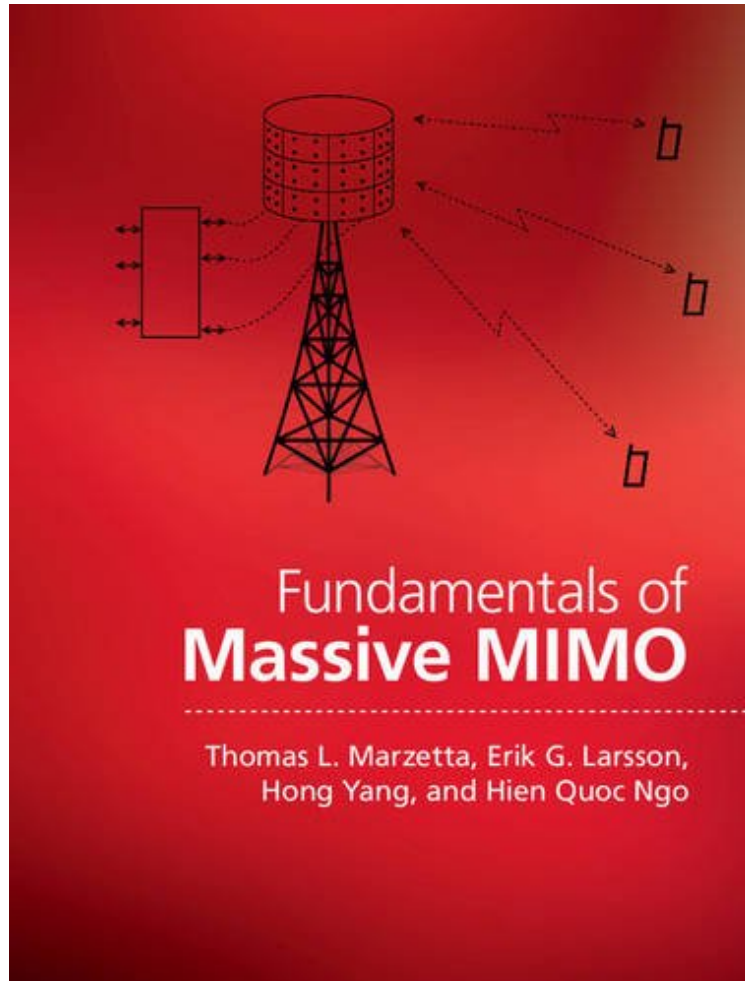


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Fundamentals of Massive MIMO

Thomas L. Marzetta, Erik G. Larsson, Hong Yang, Hien Quoc Ngo
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Thomas L. Marzetta, Erik G. Larsson, Hong Yang, Hien Quoc Ngo : Fundamentals of Massive MIMO before purchasing it in order to gage whether or not it would be worth my time, and all praised Fundamentals of Massive MIMO:

3 of 3 people found the following review helpful. This is a very good book written by the pioneer of massive MIMOBy CustomerThis is a very good book written by the pioneer of massive MIMO, Thomos L. Marzetta, and his collaborators. The logic is very clear, and the mathematical expressions for the basic principles and key components of massive MIMO are rigorous. This book is especially helpful to the beginner and junior students who have no prior knowledge of massive MIMO. The only pity is that, this book only introduces the most recent research results in the last chapter 8 very briefly within 6 pages (e.g., less than one page for pilot contamination, and less than one page for FDD massive MIMO, which are very important topics under extensive investigation). Thus, this book is more

preferred by the beginner and junior students than experienced PhD students and professional researchers in this new area. If you are more interested in the most recent progresses, you may refer to the book *mmWave Massive MIMO: A Paradigm for 5G* (Elsevier, 2016), and you may refer to the book *Signal Processing for 5G: Algorithms and Implementations* (Wiley-IEEE Press, 2016) if you are more interested in the more general topics of 5G. 2 of 2 people found the following review helpful. Definitive book by the inventor of the technology belongs close at hand to every engineer in advanced wireless. By Dave Burstein *Massive MIMO*, which uses 64-128 small antennas, is a crucial tool for wireless networks. It increases capacity 3-10 times in the early deployments at Softbank Japan and China Mobile. The CTOs of Sprint and T-Mobile have blogged they intend to be the first to deploy in the United States. Marzetta invented it at Bell Labs, so I expected a fine book. (I write about broadband at 5GWN dot com and was sent a review copy.) Marzetta and co-authors did an extraordinary job. The book is admirably clear, short, and definitive. They answer the key questions: what it is, why it works, and how to design the systems. The last chapter reviews the problems still to be solved. It's only 160 pages (and 50 more in appendices) but all the main topics are addressed. For depth on a particular topic, the authors point you to the original research. The book is written for engineers; some parts are hard going for a layman. The Resources list at the end references the seminal works by Paulraj, Foschini, Alamouti, Goldsmith, and the authors, as well as the 150 other works that have defined the field. It is a virtual history of MIMO from its invention by Paulraj in 1994 to the present. Massive MIMO and millimeter wave are the primary technologies for 5G wireless. Millimeter wave has short reach in cities but brings enormous capacity. Massive MIMO has broader coverage and works with standard mobile phones. Neither is best everywhere so both will play essential roles. Ted Rappaport's book on mmWave is a natural complement. *Millimeter Wave Wireless Communications*

Written by pioneers of the concept, this is the first complete guide to the physical and engineering principles of Massive MIMO. Assuming only a basic background in communications and statistical signal processing, it will guide readers through key topics in multi-cell systems such as propagation modeling, multiplexing and de-multiplexing, channel estimation, power control, and performance evaluation. The authors' unique capacity-bounding approach will enable readers to carry out effective system performance analyses and develop advanced Massive MIMO techniques and algorithms. Numerous case studies, as well as problem sets and solutions accompanying the book online, will help readers put knowledge into practice and acquire the skill set needed to design and analyze complex wireless communication systems. Whether you are a graduate student, researcher, or industry professional working in the field of wireless communications, this will be an indispensable guide for years to come.

'Massive MIMO has, over the past few years, become one of the hottest research topics in wireless, and will be a key component of 5G. This book is written by pioneers of the area in a systematic and lucid way, and works out the fundamentals without getting lost in the details. I highly recommend it to anybody working in this field.' Andreas Molisch, University of Southern California, Los Angeles 'Bright and profound, this book provides the fundamentals to understand the unique capabilities of Massive MIMO and illustrates the benefits for specific use cases. The authors are scientific pioneers and masters in explaining and sharing their proficiency in this book: it is an intellectual treat for everyone fascinated by Massive MIMO technology!' Liesbet van der Perre, Katholieke Universiteit Leuven, Belgium 'A very timely text by some of the 'founding fathers' of massive MIMO. This is a great book for both the beginner, with its simple but enlightening examples, as well as a great reference text for the more experienced engineer. The book is concise and to the point, and the summary and key points at the end of each chapter make it easy to focus your reading. Highly recommended for those that want to get an in-depth understanding of massive MIMO without spending months doing so.' Lee Swindlehurst, University of California, Irvine 'The book *Fundamentals of Massive MIMO* elegantly combines the basic principles of large multi-user MIMO wireless systems with practical case studies, which makes it useful for both researchers and practitioners. The fact that the book is fully self-contained also makes it an excellent teaching resource. There is no doubt that it will become the standard reference on massive MIMO.' Christoph Studer, Cornell University 'Massive MIMO will dramatically change the way we use multiple antenna technologies in next generation mobile wireless cellular systems, offering new potential for effective interference mitigation while maximizing spectral efficiency; this book, written by a group of experts in the field including the inventor of this new and exciting technology himself, will prove to be an invaluable reference for every wireless communications engineer.' Stephan ten Brink, University of Stuttgart, Germany 'This is an excellent book on a very timely topic, written by some of the top researchers in the area of massive MIMO. I would encourage researchers, students and practicing engineers to consult this book.' Rick S. Blum, Lehigh University, Pennsylvania About the Author Thomas L. Marzetta is the originator of Massive MIMO. He is a Bell Labs Fellow at Nokia and a Fellow of the IEEE, and previously worked at Schlumberger-Doll Research and Nichols Research Corporation. He has received numerous recognitions and awards, including the IEEE W. R. G. Baker Award (2015), the IEEE Communications Society Stephen O. Rice Prize (2015), and the IEEE Guglielmo Marconi Prize Paper Award (2013). He is the recipient of an Honorary Doctorate from Linköping University, Sweden.