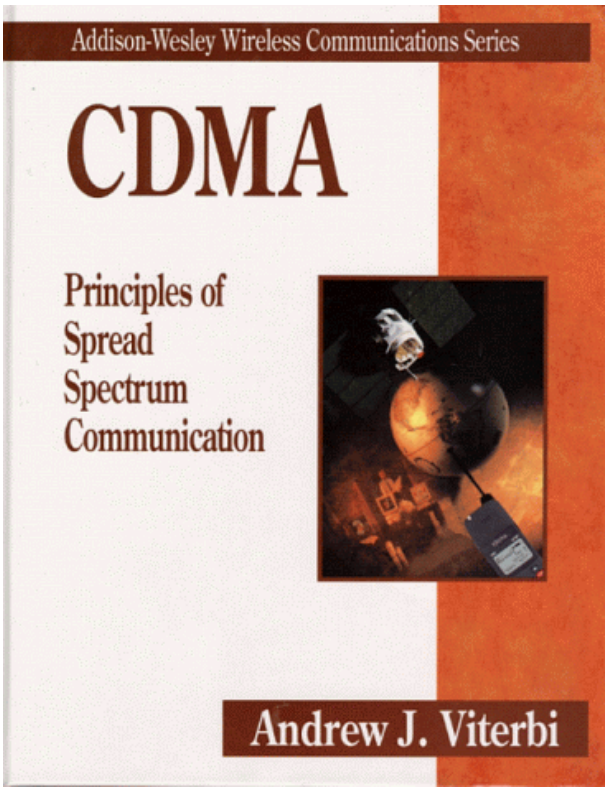
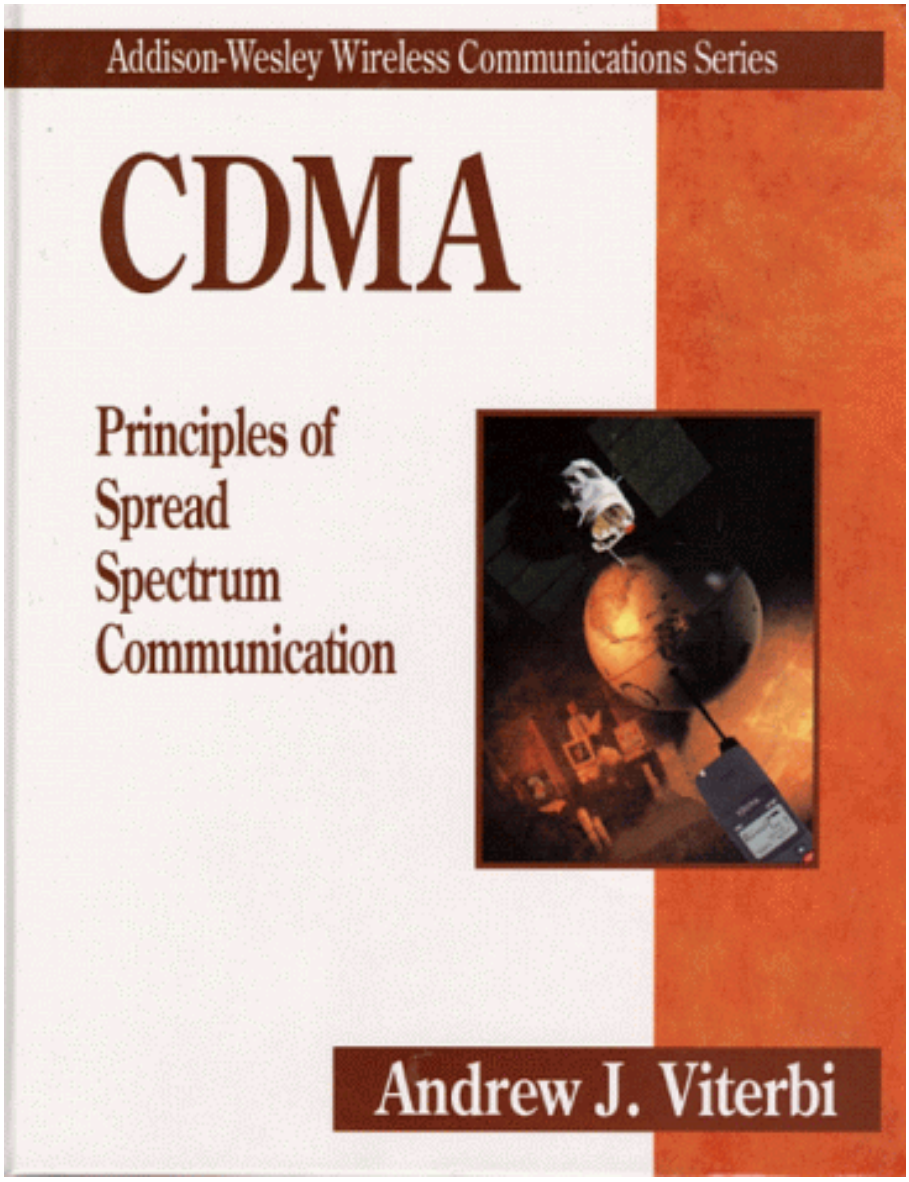
CDMA: PRINCIPLES OF SPREAD SPECTRUM COMMUNICATION BY ANDREW J. VITERBI





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From the Inside Flap
Spread spectrum communication technology has been used in military communications for over half a century, primarily for two purposes: to overcome the effects of strong intentional interference (jamming), and to hide the signal from the eavesdropper (covertness). Both goals can be achieved by spreading the signal's spectrum to make it virtually indistinguishable from background noise. Several texts, or portions of texts, on this subject have been published over the past twenty years. This book is the first to present spectrum technology specifically for commercial wireless applications.

In response to an ever-accelerating worldwide demand for mobile and personal portable communications, spread spectrum digital technology has achieved much higher bandwidth efficiency for a given wireless spectrum allocation, and hence serves a far larger population of multiple access users, than analog or other digital technologies. While it is similar in implementation to its military predecessors, the spread spectrum wireless network achieves efficiency improvements by incorporating a number of unique features made possible by the benign noise-like characteristics of the signal waveform. Chief among these is universal frequency reuse (the fact that all users, whether communicating within a neighborhood, a metropolitan area, or even a nation, occupy a common frequency spectrum allocation). Besides increasing the efficiency of spectrum usage, this also eliminates the chore of planning for different frequency allocation for neighboring users or cells. Many other important multiple access system features are made possible through this universal frequency reuse by terminals employing wideband (spread) noise-like signal waveforms. Most important is fast and accurate power control, which ensures a high level of transmission quality while level for each terminal, and hence a low level of interference to other user terminals. Another is mitigation of faded transmission through the use of a Rake receiver, which constructively combines multipath components rather than allowing them to destructively combine as in narrowband transmission. A third major benefit is soft handoff among multiple cell base stations, which provides improved cell-boundary performance and prevents dropped calls.

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20 of 22 people found the following review helpful.
Excellent reading. Well structured and detail oriented.
By A Customer
This book does a wonderful job in gradually building on the important aspects of spread spectrum technology. I liked the structure of the book more than anything else. It gradually explains important principles of CDMA technology, chapter by chapter. This book stands out from others in that the author had taken a very systematic approach in explaining each topic. This book covers all aspects of spread spectrum technology, and is good for people who are new to this field, too. I'd just suggest that readers do not get intimidated by the numerous mathematical equations present in this book. These equations merely help to explain the mathematical side of timing, sequence generation, modulation and demodulation, cell interferences, etc. Definitely not a bed-time reading book, but for a more serious reader who wants to learn about CDMA. One last word about the author...Andy Viterbi is a pioneer of this technology and commensurate with his reputation, he has done an excellent work on this text.

16 of 16 people found the following review helpful.
principles of spread spectrum communication
By A Customer
Perhaps not the best book for a beginner in CDMA, but is a very good book if you have some background in CDMA and are interested in finding out the reasons why certain things are done in the IS-95 or other CDMA standards, and the analysis/performance of the CDMA system. I liked the book because it is to the point which is nice (of course, assuming you have prior knowledge about digital communications and are familiar with CDMA). But the material covered in the book may be a little daunting to a beginner in CDMA.

30 of 32 people found the following review helpful.
Qualcomm Technical Analysis Thrown Together
By U Might B Wrong
Looks to me like Andy Viterbi pulled together some of the technical papers done at Qualcomm while developing CDMA. Of all the books Viterbi has written (or contributed to) this one seems like it was done in extreme haste. I disagree with other reviewers that claim he introduces the material well. No way.
It is true that this book is a tour de force of the performance analysis of CDMA. However, I would not describe it as readable. Maybe, not that Viterbi has made his hundreds of millions of dollars, he take time out to write a second edition that is done right.

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