Smart Antennas for Wireless Communications: IS-95 and Third Generation CDMA Applications

By Joseph Liberti, Theodore S. Rappaport

Smart Antennas for Wireless Communications: IS-95 and Third Generation CDMA Applications By Joseph Liberti, Theodore S. Rappaport

IS-95 and Third Generation CDMA Applications. The one-stop source for engineering CDMA adaptive antennas. New adaptive (smart) antenna arrays can enhance the performance of virtually any CDMA system, including IS-95, IMT-2000 and Wideband CDMA. Smart Antennas for Wireless Communications is the first book that brings together all the real-world data and expertise communications engineers need to develop smart antennas for CDMA. Start out with a detailed overview of IS-95 PCS and Cellular CDMA, including uplink and downlink signal formats and link budgets. Next, understand the full range of smart antenna technology, from simple beamforming networks to advanced multi-user spatial processing systems. Learn how adaptive antenna systems can change patterns dynamically, adjusting to noise, interference, and multipath as they track mobile users. Learn the key elements of smart antenna development, including vector channel impulse response, spatial signatures, spatial diversity, diversity combining, sectoring, and transmission beamforming. Understand important CDMA-related issues, including non-coherent and coherent CDMA spatial processors, dynamic re-sectoring, and the use of spatial fil

Smart Antennas for Wireless Communications: IS-95 and Third Generation CDMA Applications

By Joseph Liberti, Theodore S. Rappaport

Smart Antennas for Wireless Communications: IS-95 and Third Generation CDMA Applications By Joseph Liberti, Theodore S. Rappaport

IS-95 and Third Generation CDMA Applications. The one-stop source for engineering CDMA adaptive antennas. New adaptive (smart) antenna arrays can enhance the performance of virtually any CDMA system, including IS-95, IMT-2000 and Wideband CDMA. Smart Antennas for Wireless Communications is the first book that brings together all the real-world data and expertise communications engineers need to develop smart antennas for CDMA. Start out with a detailed overview of IS-95 PCS and Cellular CDMA, including uplink and downlink signal formats and link budgets. Next, understand the full range of smart antenna technology, from simple beamforming networks to advanced multi-user spatial processing systems. Learn how adaptive antenna systems can change patterns dynamically, adjusting to noise, interference, and multipath as they track mobile users. Learn the key elements of smart antenna development, including vector channel impulse response, spatial signatures, spatial diversity, diversity combining, sectoring, and transmission beamforming. Understand important CDMA-related issues, including non-coherent and coherent CDMA spatial processors, dynamic re-sectoring, and the use of spatial fil

Smart Antennas for Wireless Communications: IS-95 and Third Generation CDMA Applications By Joseph Liberti, Theodore S. Rappaport Bibliography

- Sales Rank: #1177815 in Books
- Published on: 1999-04-22
- Ingredients: Example Ingredients
- Original language: English
- Number of items: 1
- Dimensions: 9.50" h x 1.10" w x 7.00" l, 1.23 pounds
- Binding: Paperback
- 528 pages

Download and Read Free Online Smart Antennas for Wireless Communications: IS-95 and Third Generation CDMA Applications By Joseph Liberti, Theodore S. Rappaport

Editorial Review

From the Inside Flap
Smart Antennas for Wireless CommunicationsIS-95 and Third Generation CDMA ApplicationsPrefaceThis text has been created to satisfy the growing demand for knowledge in two emerging areas: adaptive antennas (also known as smart antennas) and Code Division Multiple Access. CDMA was commercialized in the early 1990s by Qualcomm, Inc., a San Diego, California, company that pioneered the use of a classic military concept for the burgeoning cellular telephone industry. Adaptive arrays, first conceptualized in the 1960s with the birth of digital signal processing, only recently have become practical for deployment; the intense growth rates of wireless services around the world are beckoning for their commercial use.This text has been developed through years of research by the authors and their colleagues at the Mobile and Portable Radio Research Group of Virginia Tech and at Bell Communications Research. Our goal in creating this text is to provide fundamental and practical information for practicing engineers, students, and researchers in industry as well as in academia. To complement the book, the second author was asked by the Institute of Electrical and Electronics Engineers (IEEE) to provide a compendium of selected readings of key journal papers dedicated to the topic of smart antennas. The compendium, when used in conjunction with this text, provides a convenient single source of literature for use in classrooms or industry short courses.The material and organization of this book stemmed from the first author's 1995 Ph.D. dissertation on the subject of CDMA and smart antennas. Since then, a great deal of work has transpired in the field, including the adoption of the IS-95 J-STD-008 CDMA standard, the new 14,400 bps voice coder for Rate Set 2 channels, new methods and models for implementation and modeling of smart antennas in CDMA, and the stringent wireless E-911 position location requirement 125m, 67% of the time imposed by the Federal Communications Commission. We have worked diligently to include up-to-the-minute information in this text. The text is arranged into 10 chapters. Chapter 1 provides an overview of CDMA and smart antennas; it includes a glossary of terms and a fundamental treatment of synchronous and asynchronous CDMA. Antenna and propagation fundamentals, as they relate to CDMA systems, are also presented. Chapter 2 provides valuable practical information on the IS-95 J-STD-008 standard, and it provides in-depth descriptions of all of the CDMA channels. Also included is an actual link budget design for a PCS CDMA system. Chapter 3 provides fundamental material on adaptive antenna arrays and array theory. The concepts of beamforming, weighting vectors, and fixed-beam vs. adaptive beam antennas are covered. Chapter 4 applies this material to specific CDMA implementations that may be used for today's IS-95 and future CDMA systems. Chapter 5 combines the concepts of CDMA and adaptive antennas to derive analytical expressions that allow wireless system designers to predict the coverage and capacity gains that adaptive antennas provide in a multi-cell CDMA system. This chapter derives classic results that have led to system capacity predictions using CDMA with and without adaptive antennas.Chapter 6 provides an overview of multipath and Direction-Of-Arrival models for wireless channels. A host of propagation models which are useful for analysis and simulation of adaptive array algorithms are presented. Chapter 7 then describes complete details of one multipath propagation model, the Geometrically Based Single Bounce Elliptical Model, which provides complete characterization of a multipath environment in microcell/picocell applications. Chapter 8 describes optimal spatial filtering approaches that use both adaptive arrays and characteristics of the CDMA signals. Building on the fundamentals provided in Chapter 3, this chapter presents optimal methods that null interference while maximizing the carrier-to-noise ratio of a desired user. Chapter 9 describes the algorithmic techniques for determining the Direction-Of-Arrival (DOA) of a signal in a multi-user interference environment. Such capabilities will be required for position location techniques. Chapter 10 concludes this text with a thorough treatment of position location algorithms and approaches. Appendix A covers the derivation of the Gaussian Approximation and its many derivatives for spread spectrum systems. Other appendices provide information

From the Back Cover

71928-6

IS-95 and Third Generation CDMA Applications.

The one-stop source for engineering CDMA adaptive antennas.

New adaptive ("smart") antenna arrays can enhance the performance of virtually any CDMA system, including IS-95, IMT-2000 and Wideband CDMA. Smart Antennas for Wireless Communications is the first book that brings together all the real-world data and expertise communications engineers need to develop smart antennas for CDMA.

Start out with a detailed overview of IS-95 PCS and Cellular CDMA, including uplink and downlink signal formats and link budgets. Next, understand the full range of smart antenna technology, from simple beamforming networks to advanced multi-user spatial processing systems. Learn how adaptive antenna systems can change patterns dynamically, adjusting to noise, interference, and multipath as they track mobile users.

Learn the key elements of smart antenna development, including vector channel impulse response, spatial signatures, spatial diversity, diversity combining, sectoring, and transmission beamforming. Understand important CDMA-related issues, including non-coherent and coherent CDMA spatial processors, dynamic re-sectoring, and the use of spatial filtering to increase range and capacity. Master all these fundamental design techniques:

- Characterization of spatio-temporal radio channels.
- The geometrically-based single bounce elliptical model.
- Optimal spatial filtering and adaptive algorithms.
- Direction-Of-Arrival estimation algorithms.
- This book reflects the latest developments in CDMA and smart antennas, including the IS-95 and J-STD-008 CDMA standards, 14.4K vocoders, and techniques for designing RF location systems that meet the FCC's stringent E-911 requirements. Whether you're designing for today's CDMA systems or tomorrow's, you'll find it invaluable.

About the Author

JOSEPH C. LIBERTI, JR. holds a Ph.D. in electrical engineering from Virginia Tech. He is currently a Research Scientist with Bellcore in Red Bank, New Jersey, where he is working on smart antenna technology and radio channel characterization for a variety of applications including CDMA, PACS, and other forward looking wireless systems.

THEODORE S. RAPPAPORT is the James S. Tucker Professor of Engineering at Virginia Tech, founder of the university's Mobile & Portable Radio Research Group, and Chairman of Wireless Valley Communications. He holds three patents and has authored, co-authored or co-edited 12 books, including Wireless Communications: Principles and Practice (Prentice Hall PTR).

Users Review

From reader reviews:

April Young:

The book Smart Antennas for Wireless Communications: IS-95 and Third Generation CDMA Applications give you a sense of feeling enjoy for your spare time. You may use to make your capable a lot more increase. Book can being your best friend when you getting anxiety or having big problem with the subject. If you can make reading through a book Smart Antennas for Wireless Communications: IS-95 and Third Generation CDMA Applications to get your habit, you can get far more advantages, like add your current capable, increase your knowledge about some or all subjects. You can know everything if you like open and read a e-book Smart Antennas for Wireless Communications: IS-95 and Third Generation CDMA Applications. Kinds of book are several. It means that, science book or encyclopedia or some others. So , how do you think about this reserve?

Ted Bryant:

This Smart Antennas for Wireless Communications: IS-95 and Third Generation CDMA Applications are reliable for you who want to certainly be a successful person, why. The main reason of this Smart Antennas for Wireless Communications: IS-95 and Third Generation CDMA Applications can be among the great books you must have will be giving you more than just simple studying food but feed anyone with information that probably will shock your before knowledge. This book is usually handy, you can bring it just about everywhere and whenever your conditions throughout the e-book and printed people. Beside that this Smart Antennas for Wireless Communications: IS-95 and Third Generation CDMA Applications giving you an enormous of experience such as rich vocabulary, giving you trial of critical thinking that we understand it useful in your day exercise. So , let's have it and revel in reading.

Joyce Lynch:

Reading a e-book tends to be new life style in this era globalization. With reading through you can get a lot of information that will give you benefit in your life. Using book everyone in this world may share their idea. Guides can also inspire a lot of people. A great deal of author can inspire their very own reader with their story or maybe their experience. Not only the storyplot that share in the books. But also they write about the knowledge about something that you need instance. How to get the good score toefl, or how to teach your

young ones, there are many kinds of book that you can get now. The authors nowadays always try to improve their skill in writing, they also doing some analysis before they write to the book. One of them is this Smart Antennas for Wireless Communications: IS-95 and Third Generation CDMA Applications.

Deanna Jackson:

Playing with family in a park, coming to see the water world or hanging out with close friends is thing that usually you might have done when you have spare time, in that case why you don't try point that really opposite from that. One particular activity that make you not sensation tired but still relaxing, trilling like on roller coaster you have been ride on and with addition details. Even you love Smart Antennas for Wireless Communications: IS-95 and Third Generation CDMA Applications, you could enjoy both. It is good combination right, you still want to miss it? What kind of hang-out type is it? Oh can happen its mind hangout fellas. What? Still don't have it, oh come on its known as reading friends.

Download and Read Online Smart Antennas for Wireless Communications: IS-95 and Third Generation CDMA Applications By Joseph Liberti, Theodore S. Rappaport #0AROXQ2LTWK

Read Smart Antennas for Wireless Communications: IS-95 and Third Generation CDMA Applications By Joseph Liberti, Theodore S. Rappaport for online ebook

Smart Antennas for Wireless Communications: IS-95 and Third Generation CDMA Applications By Joseph Liberti, Theodore S. Rappaport Free PDF d0wnl0ad, audio books, books to read, good books to read, cheap books, good books, online books, books online, book reviews epub, read books online, books to read online, online library, greatbooks to read, PDF best books to read, top books to read Smart Antennas for Wireless Communications: IS-95 and Third Generation CDMA Applications By Joseph Liberti, Theodore S. Rappaport books to read online.

Online Smart Antennas for Wireless Communications: IS-95 and Third Generation CDMA Applications By Joseph Liberti, Theodore S. Rappaport ebook PDF download

Smart Antennas for Wireless Communications: IS-95 and Third Generation CDMA Applications By Joseph Liberti, Theodore S. Rappaport Doc

Smart Antennas for Wireless Communications: IS-95 and Third Generation CDMA Applications By Joseph Liberti, Theodore S. Rappaport Mobipocket

Smart Antennas for Wireless Communications: IS-95 and Third Generation CDMA Applications By Joseph Liberti, Theodore S. Rappaport EPub