

<<无线通信基础>>

图书基本信息

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前言

The writing of this book was prompted by two main developments in wireless communication in the past decade. First is the huge surge of research activities in physical-layer wireless communication theory. While this has been a subject of study since the sixties, recent developments such as opportunistic and multiple input multiple output (MIMO) communication techniques have brought completely new perspectives on how to communicate over wireless channels. Second is the rapid evolution of wireless systems, particularly cellular networks, which embody communication concepts of increasing sophistication. This evolution started with second-generation digital standards, particularly the IS-95 Code Division Multiple Access standard, continuing to more recent third-generation systems focusing on data applications. This book aims to present modern wireless communication concepts in a coherent and unified manner and to illustrate the concepts in the broader context of the wireless systems on which they have been applied.

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内容概要

《无线通信基础(英文版)》介绍无线通信的基本原理，着重强调概念及其在系统中的实现之间的相互影响，涉及的主要问题有MIMO通信、空时编码、机会通信、OFDM和CDMA等，这些概念均利用无线系统的大量实例予以说明。

书中还配有大量的习题和图表，可以帮助读者进一步理解材料内容。

《无线通信基础(英文版)》适合作为通信工程和电子信息类相关专业高年级本科生和研究生的教材，也可供工程技术人员参考。

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章节摘录

Consider the baseband uplink signal of a user given in (4.1). Due to the abrupt transitions (from +1 to -1 and vice versa) of the pseudonoise sequences $s_{i,j}$, the bandwidth occupied by this signal is very large. On the other hand, the signal has to occupy an allotted bandwidth. As an example, we see that the IS-95 system uses a bandwidth of 1.2288 MHz and a steep fall off after 1.67 MHz. To fit this allotted bandwidth, the signal in (4.1) is passed through a pulse shaping filter and then modulated on to the carrier. Thus though the signal in (4.1) has a perfect PAPR (equal to 1), the resulting transmit signal has a larger PAPR. The overall signal transmitted from the base-station is the superposition of all the user signals and this aggregate signal has PAPR performance similar to that of the narrowband system described in the previous section. In the narrowband system we saw that all users can maintain high SINR due to the nature of the allocations. In fact, this was the benefit gained by paying the price of poor (re)use of the spectrum. In the CDMA system, however, due to the intra and inter-cell interferences, the values of SINR possible are very small. Now consider sectorization with universal frequency reuse among the sectors. Ideally (with full isolation among the sectors), this allows us to increase the system capacity by a factor equal to the number of sectors. However, in practice each sector now has to contend with inter-sector interference as well. Since intra-sector and inter-cell interference dominate the noise faced by the user signals, the additional interference caused due to sectorization does not cause a further degradation in SINR. Thus sectors of the same cell reuse the frequency without much of an impact on the performance. We have observed that timing acquisition (at a chip level accuracy) by a mobile is a computationally intensive step. Thus we would like to have this step repeated as infrequently as possible. On the other hand, to achieve soft handoff this acquisition has to be done (synchronously) for all base-stations with which the mobile communicates. To facilitate this step and the eventual handoff, implementations of the IS-95 system use high precision clocks (about 1 ppm (parts per million)) and further, synchronize the clocks at the base-stations through a proprietary wireline network that connects the base-stations. This networking cost is the price paid in the design to ease the handoff process.

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媒体关注与评论

“ Tse和viswanath将通信技术的理论发展和实际应用完美结合在本书中。
本书必将成为业界经典教材和权威参考。

” ——Robert G.Gallager教授，麻省理工学院 “ David Tse和Pranlod viswanath为现代无线通信撰写了一部经典著作！

本书覆盖无线系统设计基础以及无线通信领域最新进展，不仅是高校通信专业理想教材，而且是无线工程领域工程技术人员的理想指南！

” ——Roberto Padovani博士，高通公司CTO

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