<<无线通信基础>>

图书基本信息

书名：<<无线通信基础>>

13位ISBN编号：9787115200709

10位ISBN编号：711520070X

出版时间：2009-8

出版时间：人民邮电出版社

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页数：564

前言

The writing of this book was prompted by two main developments in wirelesscommunication in the past decade. First is the huge surge of research activitiesin physical-layer wireless communication theory. While this has been a subjectof study since the sixties， recent developments such as opportunistic and mul-tiple input multiple output （MIMO） communication techniques have broughtcompletely new perspectives on how to communicate over wireless channels.Second is the rapid evolution of wireless systems， particularly cellular net-works， which embody communication concepts of increasing sophistication.This evolution started with second-generation digital standards， particularlythe IS-95 Code Division Multiple Access standard， continuing to more recentthird-generation systems focusing on data applications. This book aims topresent modem wireless communication concepts in a coherent and unifiedmanner and to illustrate the concepts in the broader context of the wirelesssystems 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 abrupttransitions (from + 1 to -1 and vice versa) of the pseudonoise sequences s,,,the bandwidth occupied by this signal is very large. On the other hand, thesignal 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 pulseshaping 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 largerPAPR. The overall signal transmitted from the base-station is the superpositionof all the user signals and this aggregate signal has PAPR performance similarto that of the narrowband system described in the previous section.In the narrowband system we saw that all users can maintain high SINRdue to the nature of the allocations. In fact, this was the benefit gained bypaying 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.

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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《无线通信基础(英文版)》是一部杰出的无线通信著作：作者从一个比较高的层次、用系统的观点总结现有通信技术，并用信息论的观点诠释了近年来比较热门的MlMO、0FDM、机会通信、多用户通信等技术，着重强调概念及其在系统中的实现之间的内在联系和相互影响深刻的工程理解、理论远景和系统实践的完美结合，使《无线通信基础(英文版)》不仅成为普林斯顿大学和加州大学伯克利分校等世界众多高校的教材，也被高通等世界级通信公司用于工程师内部培训《无线通信基础(英文版)》是高等院校通信和电气信息相关专业高年级本科生裯研究生教材，是无线通信领域工程技术人员必备参考书。

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