

Synthesis Lectures on Communications

 **SYNTHESIS**
COLLECTION OF TECHNOLOGY

R. Michael Buehrer

Code Division Multiple Access (CDMA)

 Springer

Code Division Multiple Access (CDMA)

© Springer Nature Switzerland AG 2022
Reprint of original edition © Morgan & Claypool 2006

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or by any means—electronic, mechanical, photocopy, recording, or any other except for brief quotations in printed reviews, without the prior permission of the publisher.

Code Division Multiple Access (CDMA)

R. Michael Buehrer

978-3-031-00545-9 paperback

978-3-031-00545-9 paperback

978-3-031-01673-8 ebook

978-3-031-01673-8 ebook

DOI 10.1007/978-3-031-01673-8

A Publication in the Springer series
SYNTHESIS LECTURES ON COMMUNICATIONS #2

Lecture #2

Series Editor: William Tranter, Virginia Tech

Series ISSN: 1932-1244 print

Series ISSN: 1932-1708 electronic

First Edition

10 9 8 7 6 5 4 3 2 1

Code Division Multiple Access (CDMA)

R. Michael Buehrer

Virginia Polytechnic Institute and State University,
Blacksburg, Virginia, USA

SYNTHESIS LECTURES ON COMMUNICATIONS #2

ABSTRACT

This book covers the basic aspects of Code Division Multiple Access or CDMA. It begins with an introduction to the basic ideas behind fixed and random access systems in order to demonstrate the difference between CDMA and the more widely understood TDMA, FDMA or CSMA. Secondly, a review of basic spread spectrum techniques is presented which are used in CDMA systems including direct sequence, frequency-hopping, and time-hopping approaches. The basic concept of CDMA is presented, followed by the four basic principles of CDMA systems that impact their performance: interference averaging, universal frequency reuse, soft handoff, and statistical multiplexing. The focus of the discussion will then shift to applications. The most common application of CDMA currently is cellular systems. A detailed discussion on cellular voice systems based on CDMA, specifically IS-95, is presented. The capacity of such systems will be examined as well as performance enhancement techniques such as coding and spatial filtering. Also discussed are Third Generation CDMA cellular systems and how they differ from Second Generation systems. A second application of CDMA that is covered is spread spectrum packet radio networks. Finally, there is an examination of multi-user detection and interference cancellation and how such techniques impact CDMA networks. This book should be of interest and value to engineers, advanced students, and researchers in communications.

KEYWORDS

CDMA, Multiple Access, Spread Spectrum, Multiuser Detection, TDMA, FDMA, Packet Radio Networks

Explore Litigation Insights

Docket Alarm provides insights to develop a more informed litigation strategy and the peace of mind of knowing you're on top of things.

Real-Time Litigation Alerts



Keep your litigation team up-to-date with **real-time alerts** and advanced team management tools built for the enterprise, all while greatly reducing PACER spend.

Our comprehensive service means we can handle Federal, State, and Administrative courts across the country.

Advanced Docket Research



With over 230 million records, Docket Alarm's cloud-native docket research platform finds what other services can't. Coverage includes Federal, State, plus PTAB, TTAB, ITC and NLRB decisions, all in one place.

Identify arguments that have been successful in the past with full text, pinpoint searching. Link to case law cited within any court document via Fastcase.

Analytics At Your Fingertips



Learn what happened the last time a particular judge, opposing counsel or company faced cases similar to yours.

Advanced out-of-the-box PTAB and TTAB analytics are always at your fingertips.

API

Docket Alarm offers a powerful API (application programming interface) to developers that want to integrate case filings into their apps.

LAW FIRMS

Build custom dashboards for your attorneys and clients with live data direct from the court.

Automate many repetitive legal tasks like conflict checks, document management, and marketing.

FINANCIAL INSTITUTIONS

Litigation and bankruptcy checks for companies and debtors.

E-DISCOVERY AND LEGAL VENDORS

Sync your system to PACER to automate legal marketing.