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Nota di contenuto	-- Preface xxi // Acknowledgments xxv // Summary of Notations xxvii // About the Cover xxix // About the Companion Website xxxi // 1 Mathematical Background and Analysis Techniques 1 // 1.1 Introduction 1 // 1.2 The Fourier Transform and Fourier Series 5 // 1.3 Pulse Distortion with Ideal Filter Models 16 // 1.4 Correlation Processing 19 // 1.5 Random Variables and Probability 20 // 1.6 Random Processes 41 // 1.7 The Matched Filter 44 // 1.8 The Likelihood and Log-Likelihood Ratios 46 // 1.9 Parameter Estimation 47 // 1.10 Modem Configurations and Automatic Repeat Request 55 // 1.11 Windows 57 // 1.12 Matrices Vectors and Related Operations 66 // 1.13 Often Used Mathematical Procedures 70 // 1.14 Often Used Mathematical Relationships 71 // 2 Digital Signal Processing and Modem Design Considerations 81 // 2.1 Introduction 81 // 2.2 Discrete Amplitude Sampling 81 // 2.3 Discrete-Time Sampling 87 // 2.4 Signal Reconstruction Following Discrete-Time Sampling 91 // 2.5 Baseband Sampling 92 // 2.6 Bandpass Sampling 92 // 2.7 Corrections

for Nonideal Modulators and Demodulators 99 //2.8 Multirate Signal Processing and Interpolation 106 //Appendix 2A Amplitude Quantization Function Subprogram 121 //Appendix 2B Hilbert Transform Parameters 122 //Appendix 2C Derivation of Parabolic Interpolation Error 126 //3 Digital Communications 133 //3.1 Introduction 133 //3.2 Digital Data Modulation and Optimum Demodulation Criteria 135 //3.3 Information and Channel Capacity 139 //3.4 Bit-Error Probability Bound on Memoryless Channel 148 //3.5 Probability Integral and the Error Function 150 //4 Phase Shift Keying (PSK) Modulation Demodulation and Performance 153 //4.1 Introduction 153 //4.2 Constant Envelope Phase-Modulated Waveforms 154 //4.3 Non-Constant Envelope Phase-Modulated Waveforms 175 //4.4 Phase-Modulated Waveform Spectrums and Performance 178 //5 Frequency Shift Keying (FSK) Modulation Demodulation and Performance 207 //5.1 Introduction 207 //5.2 Coherent Detection of BFSK - Known Frequency and Phase 207 //5.3 Noncoherent Detection of BFSK - Known Frequency and Unknown Phase 210 //5.4 Case Studies: Coherent and Noncoherent BFSK Performance Simulation 211 //5.5 Noncoherent Detection of BFSK - Unknown Frequency and Phase 214 //5.6 BFSK Spectral Density with Arbitrary Modulation Index 219 //6 Amplitude Shift Keying Modulation Demodulation and Performance 227 //6.1 Introduction 227 //6.2 Amplitude Shift Keying (ASK) 227 //6.3 Quadrature Amplitude Modulation (QAM) 234 //6.4 Alternate QAM Waveform Constellations 236 //6.5 Case Study: 16-ary QAM Performance Evaluation 236 //6.6 Partial Response Modulation 237 //7 M-ary Coded Modulation 251 //7.1 Introduction 251 //7.2 Coherent Detection of Orthogonal Coded Waveforms 252 //7.3 Noncoherent Detection of M-ary Orthogonal Waveforms 253 //7.4 Coherent Detection of M-ary Biorthogonal Waveforms 256 //8 Coding for Improved Communications 261 //8.1 Introduction 261 //8.2 Pulse Code Modulation 261 //8.3 Gray Coding 268 //8.4 Differential Coding 269 //8.5 Pseudo-Random Noise Sequences 270 //8.6 Binary Cyclic Codes 273 //8.7 Cyclic Redundancy Check Codes 274 //8.8 Data Randomizing Codes 276 //8.9 Data Interleaving 277 //8.10 Wagner Coding and Decoding 279 //8.11 Convolutional Codes 283 //8.12 Turbo and Turbo-Like Codes 299 //8.13 LDPC Code and TPC 313 //8.14 Bose-Chaudhuri-Hocquenghem Codes 315 //Appendix 8A 328 //Appendix 8B 329 //9 Forward Error Correction Coding Without Bandwidth Expansion 339 //9.1 Introduction 339 //9.2 Multi-h M-ary CPM 340 //9.3 Case Study: 2-h 4-ary 1REC CPM 350 //9.4 Multiphase Shift Keying Trellis-Coded Modulation 362 //9.5 Case Study: Four-State 8PSK-TCM Performance Over Satellite Repeater 367 //10 Carrier Acquisition and Tracking 375 //10.1 Introduction 375 //10.2 Bandpass Limiter 377 //10.3 Baseband Phaselock Loop Implementation 378 //10.4 Phase-Error Generation 378 //10.5 First-Order Phaselock Loop 380 //10.6 Second-Order Phaselock Loop 380 //10.7 Third-Order Phaselock Loop 390 //10.8 Optimum Phase Tracking Algorithms 396 //10.9 Squaring Loss Evaluation 406 //10.10 Case Study: BPSK and QPSK Phaselock Loop Performance 408 //10.11 Case Study: BPSK Phase Tracking Performance of a Disadvantaged Transmit Terminal 410 //11 Waveform Acquisition 413 //11.1 Introduction 413 //11.2 CW Preamble Segment Signal Processing 416 //11.3 Symbol Synchronization Preamble Segment 432 //11.4 Start-of-Message (SOM) Preamble segment 452 //11.5 Signal-to-Noise Ratio Estimation 452 //12 Adaptive Systems 463 //12.1 Introduction 463 //12.2 Optimum Filtering - Wiener's Solution 464 //12.3 Finite Impulse Response-Adaptive Filter Estimation 465 //12.4 Intersymbol

Interference and Multipath Equalization 469 //12.5 Interference and Noise Cancellation 472 //12.6 Recursive Least Square (RLS) Equalizer 473 //12.7 Case Study: LMS Linear Feedforward Equalization 474 //12.8 Case Study: Narrowband Interference Cancellation 474 //12.9 Case Study: Recursive Least Squares Processing 480 //13 Spread-Spectrum Communications 485 //13.1 Introduction 485 //13.2 Spread-Spectrum Waveforms and Spectrums 487 //13.3 Jammer and Interceptor Encounters 499 //13.4 Communication Interceptors 502 //13.5 Bit-Error Performance of DSSS Waveforms with Jamming 504 //13.6 Performance of MFSK with Partial-Band Noise Jamming 512 //13.7 Performance of DCMPK with Partial-Band Noise Jamming 514 //13.8 FHSS Waveforms with Multitone Jamming 515 //13.9 Approximate Performance with Jammer Threats 521 //13.10 Case Study: Terrestrial Jammer Encounter and Link-Standoff Ratio 522 //14 Modem Testing Modeling and Simulation 531 //14.1 Introduction 531 //14.2 Statistical Sampling 532 //14.3 Computer Generation of Random Variables 539 //14.4 Baseband Waveform Description 545 //14.5 Sampled Waveform Characterization 547 //14.6 Case Study: BPSK Monte Carlo Simulation 548 //14.7 System Performance Evaluation Using Quadrature Integration 550 //14.8 Case Study: BPSK Bit-Error Evaluation with PLL Tracking 551 //14.9 Case Study: QPSK Bit-Error Evaluation with PLL Tracking 553 //15 Communication Range Equation and Link Analysis 557 //15.1 Introduction 557 //15.2 Receiver and System Noise Figures and Temperatures 560 //15.3 Antenna Gain and Patterns 568 //15.4 Rain Loss 571 //15.5 Electric Field Wave Polarization 573 //15.6 Phase-Noise Loss 578 //15.7 Scintillation Loss 583 //15.8 Multipath Loss 583 //15.9 Interface Mismatch Loss 584 //15.10 Miscellaneous System Losses 585 //15.11 Nonlinear Power Amplifier Analysis and Simulation 585 //15.12 Computer Modeling of TWTA and SSPA Nonlinearities 588 //15.13 Establishing Signal Levels for Simulation Modeling 590 //15.14 Case Study: Performance Simulation of SRRC-QPSK with SSPA Nonlinearity 592 //15.15 Link Budget Analysis 596 //16 Satellite Orbits 603 //16.1 Introduction 603 //16.2 Satellite Orbits 606 //16.3 Earth Stations 607 //16.4 Path Loss Doppler and Doppler-rate 609 //16.5 Satellite Viewing 609 //16.6 Satellite Orbit Selection 610 //16.7 Satellite Orbit Position Estimation From Parameter Measurements 611 //16.8 Case Study: Example Satellite Encounters 612 //17 Communications Through Bandlimited Time-Invariant Linear Channels 617 //17.1 Introduction 617 //17.2 Inphase and Quadrature Channel Response 618 //17.3 Inphase and Quadrature Channel Response to Arbitrary Signal 619 //17.4 Pulse Modulated Carrier Signal Characteristics 621 //17.5 Channel Response to a Pulsed Modulated Waveform 622 //17.6 Example Performance Simulations 623 //17.7 Example of Channel Amplitude and Phase Responses 624 //17.8 Example Channel Amplitude Phase and Delay Functions 627 //18 Communications in Fading Environments 633 //18.1 Introduction 633 //18.2 Ricean Fading Channels 634 //18.3 Ricean Cumulative Distribution 635 //18.4 Application of Ricean Channel Model 635 //18.5 Performance of Several Binary Modulation Waveforms with Ricean Fading 636 //18.6 Generation of Ricean Random Variables 639 //18.7 Relationships Between Fading Channel Parameters 641 //18.8 Diversity Techniques for Fading Channels 643 //19 Atmospheric Propagation 649 //19.1 Introduction 649 //19.2 Communication Link Geometry for Curved Earth 650 //19.3 Reflection 652 //19.4 Case Study: LEO Satellite Multipath Propagation 654 //19.5 Refraction 656 //19.6 Diffraction 660 //19.7 Longley-Rice Propagation Loss Model 661 //19.8 Urban Suburban and Rural

Environment Propagation Loss Models 663 //19.9 Land Mobile Satellite Propagation Loss Models 665 //19.10 Impulsive Noise Channel 667 //19.11 Ocean Wind Wave Channel 676 //19.12 Laser Communications Using Photomultiplier Detector 684 //20 Ionospheric Propagation 699 //20.1 Introduction 699 //20.2 Electron Densities: Natural Environment 700 //20.3 Electron Densities: Nuclear-Disturbed Environment 703 //20.4 The Refractive Index and Signal Propagation 704 //20.5 Signal Propagation in Severe Scintillation Environment 706 //20.6 Propagation Disturbances Following Severe Absorption 712 //20.7 Rayleigh Scintillation Channel Model 715 //20.8 Scintillation Mitigation Techniques 721 //20.9 Case Study: BPSK and DCBPSK Performance in Rayleigh Fading Channel 722 //Appendix 20A 727 //Appendix A: Classical Filters and Applications 733 //Appendix B: Digital Filter Design and Applications 747 //Appendix C: Detection of Signals in Noise 755 //Index 769.

Sommario/riassunto

This book uses a practical approach in the application of theoretical concepts to digital communications in the design of software-defined radio modems. The book discusses the design, implementation, and performance verification of waveforms and algorithms appropriate for digital data modulation and demodulation in modern communication systems. Using a building-block approach, the author provides an introduction to the advanced understanding of acquisition and data detection using source and executable simulation code to validate the communication system performance with respect to theory and design specifications. The author focuses on theoretical analysis, algorithm design, firmware and software designs, and subsystem and system testing. The book treats system designs with various channel characteristics from very low to optical frequencies. The book offers system analysis and subsystem implementation options for acquisition and data detection appropriate to the channel conditions and system specifications, and provides test methods for demonstrating system performance. This book also . Outlines fundamental system requirements and related analysis that must be established prior to a detailed subsystem design.. Includes many examples that highlight various analytical solutions and case studies that characterize various system performance measures.. Discusses various aspects of atmospheric propagation using the spherical 4/3 effective earth radius model.. Examines ionospheric propagation and uses the Rayleigh fading channel to evaluate link performance using several robust waveform modulations.. Contains end-of-chapter problems, allowing the reader to further engage with the text. Digital Communications with Emphasis on Data Modems is a great resource for communication system and digital signal processing engineers and students looking for in-depth theory and practical implementations.
