
Introduction To Iq Demodulation Of Rf Data

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Software-Defined Radio for Engineers

Pearson Education

This hands-on, laboratory driven textbook helps readers understand principles of digital signal processing (DSP) and basics of software-based digital communication, particularly software-defined networks (SDN) and software-defined radio (SDR). In the book only the most important

concepts are presented. Each book chapter is an introduction to computer laboratory and is accompanied by complete laboratory exercises and ready-to-go Matlab programs with figures and comments (available at the book webpage and running also in GNU Octave 5.2 with free software packages), showing all or most details of relevant algorithms. Students are tasked to understand programs, modify them, and apply presented concepts to recorded real

RF signal or simulated received signals, with modelled transmission condition and hardware imperfections. Teaching is done by showing examples and their modifications to different real-world telecommunication-like applications. The book consists of three parts: introduction to DSP (spectral analysis and digital filtering), introduction to DSP advanced topics (multi-rate, adaptive, model-based and multimedia - speech, audio, video -

signal analysis and processing) and introduction to software-defined modern telecommunication systems (SDR technology, analog and digital modulations, single- and multi-carrier systems, channel estimation and correction as well as synchronization issues). Many real signals are processed in the book, in the first part – mainly speech and audio, while in the second part – mainly RF recordings taken from RTL-SDR USB stick and ADALM-PLUTO module, for

example captured IQ data of VOR avionics signal, classical FM radio with RDS, digital DAB/DAB+ radio and 4G-LTE digital telephony. Additionally, modelling and simulation of some transmission scenarios are tested in software in the book, in particular TETRA, ADSL and 5G signals. Provides an introduction to digital signal processing and software-based digital communication; Presents a transition from digital signal processing to software-defined telecommunication;

Features a suite of pedagogical materials including a laboratory test-bed and computer exercises/experiments. Conference Proceedings Cambridge University Press
Based on the popular Artech House classic, Digital Communication Systems Engineering with Software-Defined Radio, this book provides a practical approach to quickly learning the software-defined radio (SDR) concepts needed for work in the field. This up-to-date volume guides

readers on how to quickly prototype wireless designs using SDR for real-world testing and experimentation. This book explores advanced wireless communication techniques such as OFDM, LTE, WLA, and hardware targeting. Readers will gain an understanding of the core concepts behind wireless hardware, such as the radio frequency front-end, analog-to-digital and digital-to-analog converters, as well as various processing technologies. Moreover, this volume includes

chapters on timing estimation, matched filtering, frame synchronization message decoding, and source coding. The orthogonal frequency division multiplexing is explained and details about HDL code generation and deployment are provided. The book concludes with coverage of the WLAN toolbox with OFDM beacon reception and the LTE toolbox with downlink reception. Multiple case studies are provided throughout the book. Both MATLAB and Simulink

source code are included to assist readers with their projects in the field. Understanding Digital Signal Processing Artech House
This book presents the principles and applications of optical fiber communication based on digital signal processing (DSP) for both single and multi-carrier modulation signals. In the context of single carrier modulation, it describes DSP for linear and nonlinear optical fiber communication systems, discussing all-optical

Nyquist modulation signal generation and processing, and how to use probabilistic and geometrical shaping to improve the transmission performance. For multi-carrier modulation, it examines DSP-based OFDM signal generation and detection and presents 4D and high-order modulation formats. Lastly, it demonstrates how to use artificial intelligence in optical fiber communication. As such it is a useful resource for students, researches and engineers in the field of

optical fiber communication.

New Trends in Information and Communications Technology Applications

John Wiley & Sons

This book constitutes the thoroughly refereed post-conference proceedings of the third International Symposium on Intelligent Systems Technologies and Applications (ISTA'17), September 13-16, 2017, Manipal, Karnataka, India. All submissions were evaluated on the basis of their significance, novelty, and technical quality. This proceedings contains 34

papers selected for presentation at the Symposium. *Mid-Infrared and Terahertz Quantum Cascade Lasers* Springer Science & Business Media This book explains physical principles, unique benefits, broad categories, implementation aspects, and performance criteria of distributed optical fiber sensors (DOFS). For each kind of sensor, the book highlights industrial applications, which range from oil and gas production to power line

monitoring, plant and process engineering, environmental monitoring, industrial fire and leakage detection, and so on. The text also includes a discussion of such key areas as backscattering, launched power limitations, and receiver sensitivity, as well as a concise historical account of the field's development.

Starting Digital Signal

Processing in

Telecommunication

Engineering BoD - Books on Demand

Imaging modalities in

radiology produce ever-increasing amounts of data which need to be displayed, optimized, analyzed and archived: a "big data" as well as an "image processing" problem. Computer programming skills are rarely emphasized during the education and training of medical physicists, meaning that many individuals enter the workplace without the ability to efficiently solve many real-world clinical problems. This book provides a foundation for the teaching and learning

of programming for medical physicists and other professions in the field of Radiology and offers valuable content for novices and more experienced readers alike. It focuses on providing readers with practical skills on how to implement MATLAB® as an everyday tool, rather than on solving academic and abstract physics problems. Further, it recognizes that MATLAB is only one tool in a medical physicist's toolkit and shows how it can be used as the "glue" to integrate

other software and processes together. Yet, with great power comes great responsibility. The pitfalls to deploying your own software in a clinical environment are also clearly explained. This book is an ideal companion for all medical physicists and medical professionals looking to learn how to utilize MATLAB in their work. Features Encompasses a wide range of medical physics applications in diagnostic and interventional radiology Advances the skill of the

reader by taking them through real-world practical examples and solutions with access to an online resource of example code The diverse examples of varying difficulty make the book suitable for readers from a variety of backgrounds and with different levels of programming experience.

Cable and Wireless Networks Springer Nature This book constitutes refereed proceedings of the 4th International Conference on New Trends in Information and

Communications Technology Applications, NTICT 2020, held on June 15, 2020. The NTICT conference was planned to take place in Baghdad on March 11-12, 2019, but due to the COVID-19 pandemic the conference has been postponed on June 15, 2020 and moved to the virtual format. The 15 full papers and 3 short papers presented were thoroughly reviewed and selected from 90 qualified submissions. The volume presents the latest research results in such areas as network

protocols, overlay and other logical network structures, wireless access networks, computer vision, machine learning, artificial Intelligence, data mining, control methods.

Applications of Space-Time Adaptive

Processing Artech House
This practical book is an accessible introduction to Orthogonal frequency-division multiplexing (OFDM) receiver design, a technology that allows digitized data to be carried by multiple carriers. It offers a

detailed simulation study of an OFDM algorithm for Wi-Fi and 4G cellular that can be used to understand other OFDM waveforms. Extensive simulation studies are included using the transmission waveform given by the IEEE 802.11 standard. Scrambler, error-correcting codes, interleaver and radio-wave propagation model are included. OFDM waveform characteristics, signal acquisition, synchronization issues, channel estimation and tracking, hard and soft

decision decoding are all covered. Detailed derivations leading to the final formula for any algorithm are given, which allows the reader to clearly understand the approximations and conditions behind the formulas and apply them appropriately. The algorithms are selected not just for the best performance from simulation study but also for easy implementation. An example is a unique algorithm for signal acquisition using the principle of maximum

likelihood detection. *Analog Circuits and Devices* Springer Science & Business Media The Principles and Application in Engineering Series is a new series of convenient, economical references sharply focused on particular engineering topics and subspecialties. Each volume in this series comprises chapters carefully selected from CRC's bestselling handbooks, logically organized for optimum convenience, and thoughtfully priced to fit

Complete Wireless Design Springer Nature This book provides a detailed review of millimeter-wave power amplifiers, discussing design issues and performance limitations commonly encountered in light of the latest research. Power amplifiers, which are able to provide high levels of output power and linearity while being easily integrated with surrounding circuitry, are a crucial component in wireless microwave systems. The book is

divided into three parts, the first of which introduces readers to mm-wave wireless systems and power amplifiers. In turn, the second focuses on design principles and EDA concepts, while the third discusses future trends in power amplifier research. The book provides essential information on mm-wave power amplifier theory, as well as the implementation options and technologies involved in their effective design, equipping researchers, circuit designers and

practicing engineers to design, model, analyze, test and implement high-performance, spectrally clean and energy-efficient mm-wave systems.

Computational and Experimental Simulations in Engineering CRC Press

This book comprises the proceedings of the 12th National Technical Symposium on Unmanned System Technology 2020 (NUSYS'20) held on October 27-28, 2020. It covers a number of topics, including intelligent robotics, novel sensor technology, control

algorithms, acoustics signal processing, imaging techniques, biomimetic robots, green energy sources, and underwater communication backbones and protocols, and it appeals to researchers developing marine technology solutions and policy-makers interested in technologies to facilitate the exploration of coastal and oceanic regions.

Medical Image Understanding and Analysis McGraw Hill Professional

Over the past decade, tremendous development of Wireless

Communications has changed human life and engineering. Considerable advancement has been made in design and architecture of related RF and microwave circuits. Introduction to Wireless Communication Circuits focusses on special circuits dedicated to the RF level of wireless communications. From oscillators to modulation and demodulation, and from mixers to RF and power amplifier circuits,

all are presented in a sequential manner. A wealth of analytical relations is provided in the text alongside various worked out examples. Related problem sets are given at the end of each chapter. Basic concepts of RF Analog Circuit Design are developed in the book.

Communication Systems Principles Using MATLAB
Cambridge University Press

This supplement contains worked out solutions to the chapter end problem sets found in Digital

Communication, Second Edition, ISBN 0-7923-9391-0.

Doppler Radar

Physiological Sensing

Springer Science & Business Media

This book presents the proceedings of the 13th International Conference on Electrical Bioimpedance, ICEBI 2007, combined with the 8th Conference on Electrical Impedance Tomography, held at the Graz University of Technology in Graz, Austria, in August 2007.
Introduction to Wireless

Communication Circuits

John Wiley & Sons

Introduces digital mobile communications with an emphasis on digital transmission methods

This book presents mathematical analyses of signals, mobile radio channels, and digital modulation methods. The new edition covers the evolution of wireless communications technologies and systems. The major new topics are OFDM (orthogonal frequency domain multiplexing), MIMO (multi-input multi-output)

systems, frequency-domain equalization, the turbo codes, LDPC (low density parity check code), ACELP (algebraic code excited linear predictive) voice coding, dynamic scheduling for wireless packet data transmission and nonlinearity compensating digital pre-distorter amplifiers. The new systems using the above mentioned technologies include the second generation evolution systems, the third generation systems with their evolution

systems, LTE and LTE-advanced systems, and advanced wireless local area network systems. The second edition of Digital Mobile Communication: Presents basic concepts and applications to a variety of mobile communication systems Discusses current applications of modern digital mobile communication systems Covers the evolution of wireless communications technologies and systems in conjunction with their background The second edition of Digital Mobile

Communication is an important textbook for university students, researchers, and engineers involved in wireless communications. *High Spectral Density Optical Communication Technologies* John Wiley & Sons Cable and Wireless Networks: Theory and Practice presents a comprehensive approach to networking, cable and wireless communications, and networking security. It describes the most important state-of-the-art fundamentals and system

details in the field, as well as many key aspects concerning the development and understanding of current and emergent services. In this book, the author gathers in a single volume current and emergent cable and wireless network services and technologies. Unlike other books, which cover each one of these topics independently without establishing their natural relationships, this book allows students to quickly learn and improve their mastering of the covered

topics with a deeper understanding of their interconnection. It also collects in a single source the latest developments in the area, typically only within reach of an active researcher. Each chapter illustrates the theory of cable and wireless communications with relevant examples, hands-on exercises, and review questions suitable for readers with a BSc degree or an MSc degree in computer science or electrical engineering. This approach makes the book well suited for higher

education students in courses such as networking, telecommunications, mobile communications, and network security. This is an excellent reference book for academic, institutional, and industrial professionals with technical responsibilities in planning, design and development of networks, telecommunications and security systems, and mobile communications, as well as for Cisco CCNA and CCNP exam preparation.

Image Analysis John Wiley & Sons

A practical guide to LTE design, test and measurement, this new edition has been updated to include the latest developments This book presents the latest details on LTE from a practical and technical perspective. Written by Agilent's measurement experts, it offers a valuable insight into LTE technology and its design and test challenges. Chapters cover the upper layer signaling and system architecture evolution

(SAE). Basic concepts such as MIMO and SC-FDMA, the new uplink modulation scheme, are introduced and explained, and the authors look into the challenges of verifying the designs of the receivers, transmitters and protocols of LTE systems. The latest information on RF and signaling conformance testing is delivered by authors participating in the LTE 3GPP standards committees. This second edition has been considerably revised to reflect the most recent

developments of the technologies and standards. Particularly important updates include an increased focus on LTE-Advanced as well as the latest testing specifications. Fully updated to include the latest information on LTE 3GPP standards Chapters on conformance testing have been majorly revised and there is an increased focus on LTE-Advanced Includes new sections on testing challenges as well as over the air MIMO testing, protocol testing and the most up-to-date

test capabilities of instruments Written from both a technical and practical point of view by leading experts in the field

In-Phase and Quadrature Imbalance Springer Nature

Amazon.com's Top-Selling DSP Book for Seven Straight Years—Now Fully Updated! Understanding Digital Signal Processing, Third Edition, is quite simply the best resource for engineers and other technical professionals who want to master and apply today's latest DSP

techniques. Richard G. Lyons has updated and expanded his best-selling second edition to reflect the newest technologies, building on the exceptionally readable coverage that made it the favorite of DSP professionals worldwide. He has also added hands-on problems to every chapter, giving students even more of the practical experience they need to succeed. Comprehensive in scope and clear in approach, this book achieves the perfect balance between theory

and practice, keeps math at a tolerable level, and makes DSP exceptionally accessible to beginners without ever oversimplifying it. Readers can thoroughly grasp the basics and quickly move on to more sophisticated techniques. This edition adds extensive new coverage of FIR and IIR filter analysis techniques, digital differentiators, integrators, and matched filters. Lyons has significantly updated and expanded his discussions of multirate processing

techniques, which are crucial to modern wireless and satellite communications. He also presents nearly twice as many DSP Tricks as in the second edition—including techniques even seasoned DSP professionals may have overlooked. Coverage includes New homework problems that deepen your understanding and help you apply what you've learned Practical, day-to-day DSP implementations and problem-solving throughout Useful new

guidance on generalized digital networks, including discrete differentiators, integrators, and matched filters Clear descriptions of statistical measures of signals, variance reduction by averaging, and real-world signal-to-noise ratio (SNR) computation A significantly expanded chapter on sample rate conversion (multirate systems) and associated filtering techniques New guidance on implementing fast convolution, IIR filter scaling, and more

Enhanced coverage of analyzing digital filter behavior and performance for diverse communications and biomedical applications Discrete sequences/systems, periodic sampling, DFT, FFT, finite/infinite impulse response filters, quadrature (I/Q) processing, discrete Hilbert transforms, binary number formats, and much more *Space Information Networks* Springer The demand to explore the largest and also one

of the richest parts of our planet, the advances in signal processing promoted by an exponential growth in computation power and a thorough study of sound propagation in the underwater realm, have lead to remarkable advances in sonar technology in the last years. The work on hand is a sum of knowledge of several authors who contributed in various aspects of sonar technology. This book intends to give a broad overview of the advances

in sonar technology of the last years that resulted from the research effort of the authors in both sonar systems and their applications. It is intended for scientist and engineers from a variety of backgrounds and even those that never had contact with sonar technology before will find an easy introduction with the topics and principles exposed here.

Multi-Carrier Spread-Spectrum John Wiley & Sons

A comprehensive introduction to the

fundamentals of design and applications of wireless communications. *Wireless Communications Systems* starts by explaining the fundamentals needed to understand, design, and deploy wireless communications systems. The author, a noted expert on the topic, explores the basic concepts of signals, modulation, antennas, and propagation with a MATLAB emphasis. The book emphasizes practical applications and concepts needed by wireless

engineers. The author introduces applications of wireless communications and includes information on satellite communications, radio frequency identification, and offers an overview with practical insights into the topic of multiple input multiple output (MIMO). The book also explains the security and health effects of wireless systems concerns on users and designers. Designed as a practical resource, the text contains a range of

examples and pictures that illustrate many different aspects of wireless technology. The book relies on MATLAB for most of the computations and graphics. This important text: Reviews the basic information needed to understand and design wireless communications systems Covers topics such as MIMO systems, adaptive antennas, direction finding, wireless security, internet of things (IoT), radio frequency identification (RFID), and

software defined radio (SDR) Provides examples with a MATLAB emphasis to aid comprehension Includes an online solutions manual and video lectures on selected topics Written for students of engineering and physics and practicing engineers and scientists, Wireless Communications Systems covers the fundamentals of wireless engineering in a clear and concise manner and contains many illustrative examples.