

Usrcp2 User Guide

This guide to radio engineering covers every technique DSP and RF engineers need to build software radios for a wide variety of wireless systems using DSP techniques. Included are practical guidelines for choosing DSP microprocessors, and systematic, object-oriented software design techniques.

This book, written by experts from universities and major industrial research laboratories, is devoted to the very hot topic of cognitive radio and networking for cooperative coexistence of heterogeneous wireless networks. Selected highly relevant advanced research is presented on spectrum sensing and progress toward the realization of accurate radio environment mapping, biomimetic learning for self-organizing networks, security threats (with a special focus on primary user emulation attack), and cognition as a tool for green next-generation networks. The research activities covered include work undertaken within the framework of the European COST Action IC0902, which is geared towards the definition of a European platform for cognitive radio and networks. Communications engineers, R&D engineers, researchers, and students will all benefit from this complete reference on recent advances in wireless communications and the design and implementation of cognitive radio systems and networks.

In conventional point-to-point wireless communication, wireless channels may suffer from multipath fading, in which signal attenuation can vary significantly over the course of a given transmission, and thus communication between transmitter and receiver is vulnerable. In recent years, a new paradigm of cooperative communication was proposed and had become a heated topic in the design of wireless networks, such as cellular networks and wireless ad hoc networks. The basic idea lies in cooperative communication is that individual mobile users in wireless networks help each other to send signals to the destination cooperatively. The destination jointly detects multiple copies of the received signals from different cooperative users. Due to the cooperative diversity, the joint detection of the combined signals can be more reliable, and system performance as well as robustness can be significantly improved. The user who helps others forward the information is called a relay. According to the functions of the relay, there are two kinds of cooperative protocols: the relay may first decode the received information and then forward it to the destination as called decode-and-forward (DF) cooperative protocol, or the relay may simply amplify the received signal and forward it as called amplify-and-forward (AF) cooperation protocol. The aim of this thesis research is to implement the DF cooperative communication system based on GNU Radio and Universal Software Radio Peripheral (USRP). Specifically, we focus on a two-user cooperation scheme, one serves as the source node, while the other can be the relay node. The experiments of this model are carried out on GNU Radio, an open-source software development toolkit, and USRPs, computer-hosted software radios. To measure the experiments results, the packet-error-rate (PER) performance analysis is provided for cooperative communications in wireless networks with different configurations, such as various relay positioning, power allocation, payload length and experiment environment. From the simulation results, we can see that the location of the relay plays a critical role in the performance of cooperative communication. The closer the relay to the source, the more transmitter power is preserved; while the closer the relay to the destination, the more receiver power is kept. It is observed that laying the relay near around midpoint of the source and destination will achieve the best cooperative performance. Regarding various power allocation, in a certain low power range, the larger the power is, the better the transmission performance is. However, beyond this power range, different as expected, the less the power is, the better result there will be. This could possibly be caused by the limitation of the amplifier in the USRP boards. Furthermore, with regard to different payload length, the longer the packet is, the more possibilities that the packet is decoded wrong. Finally, tests in different environment show that no matter inside a room, in the narrow hall way, or in open space, the above transmission trend turns out to be the same. The main contribution of the thesis lies in: First, the implementation of the channel estimation based on GNU Radio and USRPs; Second, the design of packet format in order to implement the DF cooperation systems; Third, the implementation of the maximum ratio combining (MRC) and joint decode at the destination. In this research project, we achieve the goal of implementing the DF cooperative communication protocols on the platform of GNU Radio and USRPs, verifying the theoretical performance in books, and learning from experiment results under different scenarios and contributing to the design of DF cooperative communication systems.

Starts with an overview of today's FPGA technology, devices, and tools for designing state-of-the-art DSP systems. A case study in the first chapter is the basis for more than 30 design examples throughout. The following chapters deal with computer arithmetic concepts, theory and the implementation of FIR and IIR filters, multirate digital signal processing systems, DFT and FFT algorithms, and advanced algorithms with high future potential. Each chapter contains exercises. The VERILOG source code and a glossary are given in the appendices, while the accompanying CD-ROM contains the examples in VHDL and Verilog code as well as the newest Altera "Baseline" software. This edition has a new chapter on adaptive filters, new sections on division and floating point arithmetics, an up-date to the current Altera software, and some new exercises.

Mobile Multimedia Communications

Computational Complexity of Signal Processing Functions in Software Radio

Wireless Security Secrets and Solutions

MATLAB Simulations for Radar Systems Design

Cooperative Relaying Using USRP and GNU Radio

Introduction to Wireless Sensor Networks

This book focuses on the principles of wireless sensor networks (WSNs), their applications, and their analysis tools, with meticulous attention paid to definitions and terminology. This book presents the adopted technologies and their manufacturers in detail, making WSNs tangible for the reader. In introductory computer networking books, chapter sequencing follows the bottom-up or top-down architecture of the 7-layer protocol. This book addresses subsequent steps in this process, both horizontally and vertically, thus fostering a clearer and deeper understanding through chapters that elaborate on WSN concepts and issues. With such depth, this book is intended for a wide audience; it is meant to be a helper and motivator for senior undergraduates, postgraduates, researchers, and practitioners. It lays out important concepts and WSN-related applications; uses appropriate literature to back research and practical issues; and focuses on new trends. Senior undergraduate students can use it to familiarize themselves with conceptual foundations and practical project implementations. For graduate students and researchers, test beds and simulators provide vital insights into analysis methods and tools for WSNs. Lastly, in addition to applications and deployment, practitioners will be able to learn more about WSN manufacturers and components within several platforms and test beds.

Wireless Communications had radical growth because of the necessity of people being connected. However, interference, noise, and multiple fading have adverse effects to a reliable system. Bit Error Rate has its own importance in Quality of Service (QoS). This thesis performed an analysis and measurement of bit error rates over long term scales in both indoor as well as outdoor environments with the help of Software Defined Radio's (SDR). Software Defined Radio technology provides cost effective approach and flexibility whereas the hardware approach of traditional systems has significant limitations. We used SDR that implements radio functionalities in software. The transmissions have been achieved using the Universal Software Radio Peripheral (USRP), with the time synchronization and signal processing occurring in the GNU Radio environment on the Linux platform. The GNU radio allows us to modify several channel parameters to test the behavior of the wireless channel in the real time environment. In an indoor environment, radios were separated by 20 meters in the presence of an obstruction, which caused signal attenuation. And for outdoor environment, radios were separated by 50 meters, so noise played as major role. A series of packets have been transmitted between the two USRP radios with different channel properties in multiple scenarios. Bit error rate was computed, visualized and compared across multiple scenarios using MATLAB for different modulation schemes like BPSK, QPSK and GMSK. Observed results show a series of time dynamics of BER which are not commonly studied in the literature.

This book explore the use of new technologies in the area of satellite navigation receivers. In order to construct a reconfigurable receiver with a wide range of applications, the authors discuss receiver architecture based on software-defined radio techniques. The presentation unfolds in a user-friendly style and goes from the basics to cutting-edge research. The book is aimed at applied mathematicians, electrical engineers, geodesists, and graduate students. It may be used as a textbook in various GPS technology and signal processing courses, or as a self-study reference for anyone working with satellite navigation receivers.

Explores real-world wireless sensor network development, deployment, and applications Presents state-of-the-art protocols and algorithms Includes end-of-chapter summaries, exercises, and references For students, there are hardware overviews, reading links, programming examples, and tests available at [website] For Instructors, there are PowerPoint slides and solutions available at [website]

Getting Started with OpenBTS

Cognitive Radio Communications and Networks

Digital Wireless Communication

Digital Communications

A Software Approach

Today's mobile user wants more reliable services with faster data speed. Multiple-Input Multiple-Output (MIMO) can help to achieve higher diversity of the communication system with high data rate. In today's world, video streaming have become very important because of the application in augmented reality, 3D hologram and virtual reality. The aim of the thesis is to demonstrate MIMO and video streaming technology with a Software Defined Radio (SDR) testbed. This thesis is concerned with two main objectives: real-time video streaming with directional antennas and space-time coding with higher modulation schemes. In the first objective of the thesis, directional transmitter and receiver of higher modulation such as 128-QAM (Quadrature Amplitude Modulation) or 256-QAM signaling are designed in LabVIEW and implemented with software defined testbed with directional antennas. The impairments produced by the system like frequency offset, frequency drift, phase offset, In phase/Quadrature (I/Q) offset, modulation error ratio, IQ gain imbalance, magnitude error of peak, phase error of peak are measured. Furthermore, using higher modulation scheme live video is transferred from one Universal Software Defined Radio Peripheral (USRP) to another USRP with higher data rate and higher frame rate. In the second objective of the thesis, basic space-time coding is implemented with software defined radio testbed for obtaining higher diversity of the communication system. We are interested in finding the error rate of space-time coding with 16-QAM modulation scheme. We also analyze the performance of the received signals based on several metrics such as quadrature skew, IQ gain imbalance, modulation error ratio, phase offset, frequency drift, frequency offset, phase error in peak and

magnitude error in peak before and after using space-time wireless coding with the 16-QAM modulation scheme. All the algorithms designed are implemented using the USRP SDR testbed with LabVIEW software.

Discover all the security risks and exploits that can threaten iOS-based mobile devices iOS is Apple's mobile operating system for the iPhone and iPad. With the introduction of iOS5, many security issues have come to light. This book explains and discusses them all. The award-winning author team, experts in Mac and iOS security, examines the vulnerabilities and the internals of iOS to show how attacks can be mitigated. The book explains how the operating system works, its overall security architecture, and the security risks associated with it, as well as exploits, rootkits, and other payloads developed for it. Covers iOS security architecture, vulnerability hunting, exploit writing, and how iOS jailbreaks work Explores iOS enterprise and encryption, code signing and memory protection, sandboxing, iPhone fuzzing, exploitation, ROP payloads, and baseband attacks Also examines kernel debugging and exploitation Companion website includes source code and tools to facilitate your efforts iOS Hacker's Handbook arms you with the tools needed to identify, understand, and foil iOS attacks.

Gain the essential grammar skills needed to communicate more confidently in Spanish! Developing a good grasp of grammar is key to mastering a foreign language. This bestselling guide provides comprehensive coverage of all the elements of Spanish grammar. Each grammatical concept is clarified and then illustrated with lively example sentences. More than 400 exercises provide you with plenty of practice to apply this knowledge in everyday conversation. The exercises are contextualized with scene-setting instructions in Spanish to ensure relevance to practice conversational and writing requirements. With this edition, you'll also have access to the unique McGraw-Hill Education Language app featuring extensive audio recordings and interactive quizzes. The app makes it easy to study on-the-go, test your comprehension, and hone your new language skills. The Ultimate Spanish Review and Practice, 4th Edition features:

- More than 400 engaging exercises
- A pre-test to identify your existing strengths and weaknesses
- A post-test for assessing your progress
- Flashcards for all the vocabulary lists with progress tracking
- Extensive audio exercises to test your listening comprehension
- Interactive quizzes, and more

Here is a method for using the phase of an HF radio signal for use in location analysis. This computation is implemented in a software defined radio processing block in the GNU Radio environment. The signals analyzed are received by an Ettus Research USRP SDR. We created a phase analysis system called WMU Rootsync, which compares the roots of a received signal to the roots of a generated reference signal for the phase analysis. This research describes a prototype method for phase analysis only. Future projects may use these ideas differently than presented here. We intend for future projects to use this phase information to measure distance for use in location analysis in turn used to help persons navigate in areas where GPS or other alternatives may not function or may otherwise be impractical.

7th International ICST Conference, MOBIMEDIA 2011, Cagliari, Italy, September 5-7, 2011, Revised Selected Papers

Fundamentals and Applications

Digital Signal Processing with Field Programmable Gate Arrays

Selected Advances on Spectrum Sensing, Learning, and Security Approaches

Inside Radio: An Attack and Defense Guide

Software-Defined Radio for Engineers

The Latest Linux Security Solutions This authoritative guide will help you secure your Linux network--whether you use Linux as a desktop OS, for Internet services, for telecommunications, or for wireless services. Completely rewritten the ISECOM way, Hacking Exposed Linux, Third Edition provides the most up-to-date coverage available from a large team of topic-focused experts. The book is based on the latest ISECOM security research and shows you, in full detail, how to lock out intruders and defend your Linux systems against catastrophic attacks. Secure Linux by using attacks and countermeasures from the latest OSSTMM research Follow attack techniques of PSTN, ISDN, and PSDN over Linux Harden VoIP, Bluetooth, RF, RFID, and IR devices on Linux Block Linux signal jamming, cloning, and eavesdropping attacks Apply Trusted Computing and cryptography tools for your best defense Fix vulnerabilities in DNS, SMTP, and Web 2.0 services Prevent SPAM, Trojan, phishing, DoS, and DDoS exploits Find and repair errors in C code with static analysis and Hoare Logic

From personal music players to anti-lock brakes and advanced digital flight controllers, the demand for real-time digital signal processing (DSP) continues to grow. Mastering real-time DSP is one of the most challenging and time-consuming pursuits in the field, exacerbated by the lack of a resource that solidly bridges the gap between theory and practice. Recognizing that there is a better way forward, accomplished experts Welch, Wright, and Morrow offer Real-Time Digital Signal Processing from MATLAB to C with the TMS320C6x DSK. This book collects all of the necessary tools in a single, field-tested source of unrivaled authority. The

authors seamlessly integrate theory with easy-to-use, inexpensive hardware and software tools in an approachable and hands-on manner. Using abundant examples and exercises in a step-by-step approach, they work from familiar interfaces such as MATLAB® to running algorithms in real-time on industry-standard DSP hardware. For each concept, the book uses a four-step methodology: a brief review of relevant theory; demonstration of the concept in winDSK6, an easy-to-use software tool; explanation and demonstration of MATLAB techniques for implementation; and explanation of the necessary C code to implement the algorithms in real time. Covering a broad spectrum of topics in a hands-on, concise, and approachable way, Real-Time Digital Signal Processing from MATLAB to C with the TMS320C6x DSK paves the way toward mastery of real-time DSP. Essential source code is available for download. Simulation is integral to the successful design of modern radar systems, and there is arguably no better software for this purpose than MATLAB. But software and the ability to use it does not guarantee success. One must also: Understand radar operations and design philosophy Know how to select the radar parameters to meet the design req

All the expert guidance you need to understand, build, and operate GPS receivers The Second Edition of this acclaimed publication enables readers to understand and apply the complex operation principles of global positioning system (GPS) receivers. Although GPS receivers are widely used in everyday life to aid in positioning and navigation, this is the only text that is devoted to complete coverage of their operation principles. The author, one of the foremost authorities in the GPS field, presents the material from a software receiver viewpoint, an approach that helps readers better understand operation and that reflects the forecasted integration of GPS receivers into such everyday devices as cellular telephones. Concentrating on civilian C/A code, the book provides the tools and information needed to understand and exploit all aspects of receiver technology as well as relevant navigation schemes: Overview of GPS basics and the constellation of satellites that comprise the GPS system Detailed examination of GPS signal structure, acquisition, and tracking Step-by-step presentation of the mathematical formulas for calculating a user's position Demonstration of the use of computer programs to run key equations Instructions for developing hardware to collect digitized data for a software GPS receiver Complete chapter demonstrating a GPS receiver following a signal flow to determine a user's position The Second Edition of this highly acclaimed text has been greatly expanded, including three new chapters: Acquisition of weak signals Tracking of weak signals GPS receiver related subjects Following the author's expert guidance and easy-to-follow style, engineers and scientists learn all that is needed to understand, build, and operate GPS receivers. The book's logical flow from basic concepts to applications makes it an excellent textbook for upper-level undergraduate and graduate students in electrical engineering, wireless communications, and computer science.

Hacking Exposed Wireless

Concepts, Applications, Experimentation and Analysis

FSK Transceiver Implementation by Means of Reprogramming the FPGA of the USRP

Real-Time Digital Signal Processing from MATLAB to C with the TMS320C6x DSK

Multi-Standard CMOS Wireless Receivers: Analysis and Design

Development of a Software-Defined Underwater Acoustic Communication System

Wireless communication systems have shown a tremendous development in recent years. New technologies are born day to day. With today's technology, users can communicate with each other world. But wireless technologies are often prone to various effects like multipath fading, interference, low signal strength, reduced spectrum efficiency etc. which makes this system less reliable. Researchers are continuously working to develop technologies that can make the performance of a wireless system much better. Cooperative Communications is one of the fastest growing research areas that enable efficient spectrum usage and create a reliable network. In traditional networks, the physical layer is only responsible for communication in between two nodes which are more hindered to network. Cooperative Communication creates an extra communication with the help of a Relay in between the terminals which thereby enhances the signal quality. We implement this strategy using two Radios (USRP-Universal Software Radio peripheral) which act as a Transmitter, a Receiver and a Relay. Our main goal is to verify the communication in between the two Radios (a Direct Link) and compare it with communication by introducing a Relay in between the two radios. The Relay is made to operate on Amplify & Forward and Decode & Forward scenarios. Characteristics like packet error rate (PER) and character error rates are studied with respect to individual scenarios and overall bit error rate (BER) of the system is calculated. Then performance is compared against different scenarios of transmit and receive gains, and relaying approaches with the goal of determining which approaches are best in which scenarios.

Software Defined Radio makes wireless communications easier, more efficient, and more reliable. This book bridges the gap between academic research and practical implementation. When beginning engineers, technical managers, and graduate students can save countless hours by considering the concepts presented in these pages. The author covers the myriad options and trade-offs available for choosing an appropriate hardware architecture. As demonstrated here, the choice between hardware- and software-centric architecture can mean the difference between meeting an aggressive schedule and multiple design iterations. Because of the author's experience overseeing dozens of failed and successful developments, he is able to present many real-life examples. Some of the key concepts covered are

architecture for the market – laboratory, military, or commercial, Hardware platforms – FPGAs, GPPs, specialized and hybrid devices, Standardization efforts to ensure interoperability and portability components for radio frequency, mixed-signal, and baseband processing. The text requires only minimal knowledge of wireless communications; whenever possible, qualitative arguments are used appendix provides a quick overview of wireless communications and introduces most of the concepts the readers will need to take advantage of the material. An essential introduction to SDR, the invaluable addition to any technical bookshelf.

With the increase of wireless devices, the wireless spectrum is becoming overloaded causing users to experience delays and performance degradation. Typically, a device will start transmitting and continue transmitting on that frequency regardless of the channel being overloaded or not. Some smarter devices such as routers are able to sense when their channel is becoming overloaded by the amount of devices transmitting on that frequency. Spectrum analyzers are usually very expensive and usually do not provide many functionalities other than analysis. Utilizing newer alternatives such as Software Defined Radios (SDR) can address frequency allocation problems and allow users to decide the best frequency to use for communication. A promising SDR such as GNU Radio with this thesis, as well as the hardware components needed for its functionality. In this thesis, a cognitive radio approach is taken in designing a channel selection algorithm by scanning and monitoring the IEEE 802.11 b/g through the use of GNU Radio and USRP. Tests are performed as a proof of concept and to help future research with the use of cognitive radios.

Abstract : This report started with a brief history and recent development of underwater acoustic communication systems as well as software-defined radio technologies. Then, some challenges in channels and available underwater acoustic communication modems are discussed. After finished introducing the basics of SDR and GNU Radio, a detailed description of implementing a software-defined communication system in GNU Radio are presented, along with some key concepts of the system. Then, some hardware specifications are presented, following by detailed documentation on a software-defined communication system experiment with a host computer, a USRP, an acoustic hydrophone, and a hydrophone. At the end of Section 4, the results of the experiment are discussed. Lastly, the conclusions are made. Some possible directions for future work are suggested in Section 6.

A Software-Defined GPS and Galileo Receiver

Wireless Sensor Networks

Implementation of Decode-and-forward Cooperative Communication Protocol Based on Usrcs and Gnu Radio

Studies in Software-Defined Radio System Implementation

iOS Hacker's Handbook

Implementing Software Defined Radio

[ANGLÈS] The objective of this thesis is to study the performance improvement of the USRP N210 through re-programming of the FPGA that controls the device. This compares with part of the signal processing inside the FPGA (modifying the original image of the FPGA) and perform all the signal processing on the computer (Simulink). With the help of a channel emulator simulations for different types of channels are made. To make this comparison, it is designed a Spread Spectrum Channel Sounder (with which the channel impulse response is obtained) and a non-coherent FSK modulation. Adding a Zero Forcing equalizer channel response is used to improve the demodulation of the signal.

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.

The clear, easy-to-understand introduction to digital communications Completely updated coverage of today's most critical technologies Step-by-step implementation coverage Trellis-coded modulation, fading channels, Reed-Solomon codes, encryption, and more Exclusive coverage of maximizing performance with advanced "turbo codes" "This is a remarkably comprehensive treatment of the field, covering in considerable detail modulation, coding (both source and channel), encryption, multiple access and spread spectrum. It can serve both as an excellent introduction for the graduate student with some background in probability theory or as a valuable reference for the practicing communication system engineer. For both communities, the treatment is clear and well presented." - Andrew Viterbi, The Viterbi Group Master every key digital communications technology, concept, and technique. Digital Communications, Second Edition is a thoroughly revised and updated edition of the field's classic, best-selling introduction. With remarkable clarity, Dr. Bernard Sklar introduces every digital communication technology at the heart of today's wireless and Internet revolutions, providing a unified structure and context for understanding them -- all without sacrificing mathematical precision. Sklar begins by introducing the fundamentals of signals, spectra, formatting, and baseband transmission. Next, he presents practical coverage of virtually every contemporary modulation, coding, and signal processing technique, with numeric examples and step-by-step implementation guidance. Coverage includes: Signals and processing steps: from information source through transmitter, channel, receiver, and information sink Key tradeoffs: signal-to-noise ratios, probability of error, and bandwidth expenditure Trellis-coded modulation and Reed-Solomon codes: what's behind the math Synchronization and spread spectrum solutions Fading channels: causes, effects, and techniques for withstanding fading The first complete how-to guide to turbo codes: squeezing maximum performance out of digital connections Implementing encryption with PGP, the de facto industry standard Whether you're building wireless systems, xDSL, fiber or coax-based services, satellite networks, or Internet infrastructure, Sklar presents the theory and the practical implementation details you need. With nearly 500 illustrations and 300 problems and exercises, there's never been a faster way to master advanced digital communications. CD-ROM INCLUDED The CD-ROM contains a complete educational version of Elanix' SystemView DSP design software, as well as detailed notes for getting started, a comprehensive DSP tutorial, and over 50 additional communications exercises.

This is the first book on the subject of multi-standard wireless receivers. It covers both the analysis and design aspects of CMOS radio receivers, with primary focus on receivers for mobile terminals. The subject of multi-standard data converter design for base stations is also covered.

The Ultimate Spanish Review and Practice, 4th Edition

Implementation of a Channel Selection Algorithm Using Cognitive Radios

Fundamentals of Global Positioning System Receivers

A Single-Frequency Approach

Hacking Exposed Wireless, Second Edition

Hearings Before a Subcommittee of the Committee on Appropriations, House of Representatives, Ninety-sixth Congress, First Session

This cutting-edge resource offers practical overview of cognitive radio, a paradigm for wireless communications in which a network or a wireless node changes its transmission or reception parameters. The alteration of parameters is based on the active monitoring of several factors in the external and internal radio environment. This book offers a detailed description of cognitive radio and its individual parts. Practitioners learn how the basic processing elements and their capabilities are implemented as modular components. Moreover, the book explains how each component can be developed and tested independently, before integration with the rest of the engine. Practitioners discover how cognitive radio uses artificial intelligence to achieve radio optimization. The book also provides an in-depth working example of the developed cognitive engine and an experimental scenario to help engineers understand its performance and behavior.

In this chapter, we propose a novel design of scalable and real-time data acquisition software architecture for software-defined radio (SDR) using universal software radio peripheral (USRP). The software has been designed and tested in multi-thread model, using LabVIEW, which guarantees real-time performance and efficiency. With the help of this design, we have been able to improve the stability of the system besides providing a reconfigurable and flexible architecture. Wireless transfer of sensitive data using communication is not a very safe option. In this chapter, we aim to provide a safe and private wireless transmission between two terminals using the SDR approach and verifying the results in real-world environment with the use of USRP. The novel design being presented here can be used to transfer (random data, text or an image) encoded with different forward error correction (FEC) codes, which is then verified at the receiving terminal and then decoded accordingly to produce the desired result.

The increased usage of mobile communication devices has imposed a challenge of achieving efficient communication with minimum power consumption. Moreover, with the advent of software defined radios (SDR), it is highly possible that signal processing functions would be implemented in software in future mobile devices. Hence, the power consumption of these future devices will be directly related to the power consumed by the processor that executes SDR software. This thesis aims at analyzing the computational complexity of different modulation schemes and signal processing communication functions of IEEE WiFi standard. This analysis provides good insight on how the computational load varies at different data rates for different modulation schemes. For this purpose, we have analyzed computational complexity of various modulation schemes and other communication functions using widely known software radio platform i.e. USRP hardware and GNU Radio open source software platform, Matlab and OProfile (open source Linux profiling tool). After performing an extensive analysis, we are able to determine how different modulation schemes and communication functions perform computationally on a given platform. This analysis would help to achieve effective communication along with the efficient use of power in SDR based systems.

Cognitive Radio Communications and Networks gives comprehensive and balanced coverage of the principles of cognitive radio communications, cognitive networks, and details of their implementation, including the latest developments in the standards and spectrum policy. Case studies, end-of-chapter questions, and descriptions of various platforms and test beds, together with sample code, give hands-on knowledge of how cognitive radio systems can be implemented in practice. Extensive treatment is given to several standards, including IEEE 802.22 for TV White Spaces and IEEE SCC41. Written by leading people in the field, both at universities and major industrial research laboratories, this tutorial text gives communications engineers, R&D engineers, researchers, undergraduate and post graduate students a complete reference on the application of wireless communications and network theory for the design and implementation of cognitive radio systems and networks. Each chapter is written by internationally renowned experts, giving complete and balanced treatment of the fundamentals of both cognitive radio communications and cognitive networks, together with implementation details. Extensive treatment of the latest standards and spectrum policy developments enables the development of compliant cognitive systems. Strong practical orientation - through case studies and descriptions of cognitive radio platforms and testbeds - shows how real world cognitive radio systems and network architectures have been built. Alexander M. Wyglinski is an Assistant Professor of Electrical and Computer Engineering at Worcester Polytechnic Institute (WPI), Director of the WPI Limerick Project Center, and Director of the Wireless Innovation Laboratory (WI Lab). Each chapter is written by internationally renowned experts, giving complete and balanced treatment of the fundamentals of both cognitive radio communications and cognitive networks, together with implementation details. Extensive treatment of the latest standards and spectrum policy developments enables the development of compliant cognitive systems. Strong practical orientation - through case studies and descriptions of cognitive

radio platforms and testbeds – shows how "real world" cognitive radio systems and network architectures have been built

Archie 3000

Analyzing Bit Error Rate Using Universal Software Radio Peripheral (USRP) Software Defined Radio in Indoor and Outdoor Environments

Principles and Practice

The Folded Normal Distribution

Cognitive Communication and Cooperative HetNet Coexistence

A Modern Approach to Radio Engineering

This book constitutes the thoroughly refereed post-conference proceedings of the 7th International ICST Conference on Mobile Multimedia Communications (MOBIMEDIA 2011) held in Cagliari, Italy, in September 2011. The 26 revised full papers presented were carefully selected from numerous submissions and focus topics such as quality of experience, dynamic spectrum access, wireless networks in the TV white spaces, media streaming, mobile visual search, image processing and transmission, and mobile applications.

We consider first the folded normal probability density function, especially as it relates to the original normal population from which it came. We present some maximum likelihood estimates, followed by other estimating procedures which are simpler to handle... Finally, an example of real camber data is presented with the appropriate estimation of the theoretical distributions. Some remarks of the folded normal and other work being done on this conclude the paper.

Over the past decade, software-defined radios (SDRs) have an increasingly prevalent aspect of wireless communication systems. Different than traditional hardware radios which implement radio protocols using static electrical circuit, SDRs implement significant aspects of physical radio protocol using software programs running on a host processor. Because they use software to implement most of the radio functionality, SDRs are much more easily modified, edited, and upgraded than their hardware-defined counterparts. Consequently, researchers and developers have been developing previously hardware-defined radio systems within software. Thus, communication standards can be tested under different conditions or swapped out entirely by simply changing some code. Additionally, developers hope to implement more advanced functionality with SDRs such as cognitive radios that can sense the conditions of the environment and change parameters or protocol accordingly. This paper will outline the major aspects of SDRs including their explanation, advantages, and architecture. As SDRs have become more commonplace, many companies and organizations have developed hardware front-ends and software packages to help develop software radios. The most prominent hardware front-ends to date have been the USRP hardware boards. Additionally, many software packages exist for SDR development, including the open source GNU Radio and OSSIE and the closed source Simulink and Labview SDR packages. Using these development tools, researchers have developed many of the most relevant radio standards. This paper will explain the major hardware and software development tools for creating SDRs, and it will explain some of the most important SDR projects that have been implemented to date.

Getting Started with OpenBTS"O'Reilly Media, Inc."

Physical Layer Exploration Lab Using the NI USRP : Student Lab Manual

Linux Security Secrets and Solutions

Foreign Assistance and Related Programs Appropriations for 1980

Study of Feasibility for Phase Difference Extraction Using Software Defined Radio in Location Analysis

The Stranger's Guide to Hampton Court Palace and Gardens

Software Radio

The latest wireless security solutions Protect your wireless systems from crippling attacks using the detailed security information in this comprehensive volume.

Thoroughly updated to cover today's established and emerging wireless technologies, Hacking Exposed Wireless, second edition reveals how attackers use readily available and custom tools to target, infiltrate, and hijack vulnerable systems. This book discusses the latest developments in Wi-Fi, Bluetooth, ZigBee, and DECT hacking, and explains how to perform penetration tests, reinforce WPA protection schemes, mitigate packet injection risk, and lock down Bluetooth and RF devices.

Cutting-edge techniques for exploiting Wi-Fi clients, WPA2, cordless phones, Bluetooth pairing, and ZigBee encryption are also covered in this fully revised guide.

Build and configure your Wi-Fi attack arsenal with the best hardware and software tools Explore common weaknesses in WPA2 networks through the eyes of an attacker Leverage post-compromise remote client attacks on Windows 7 and Mac OS X Master attack tools to exploit wireless systems, including Aircrack-ng,

coWPAtty, Pyrit, IPPON, FreeRADIUS-WPE, and the all new KillerBee Evaluate your threat to software update impersonation attacks on public networks Assess your threat to eavesdropping attacks on Wi-Fi, Bluetooth, ZigBee, and DECT networks using commercial and custom tools Develop advanced skills leveraging Software

Defined Radio and other flexible frameworks Apply comprehensive defenses to protect your wireless devices and infrastructure

Classical and Modern Direction of Arrival Estimation contains both theory and practice of direction finding by the leading researchers in the field. This unique blend of techniques used in commercial DF systems and state-of-the-art super-resolution methods is a valuable source of information for both practicing engineers and researchers. Key topics covered are: Classical methods of direction finding Practical DF methods used in commercial systems Calibration in antenna arrays Array mapping, fast algorithms and wideband processing Spatial time-frequency distributions for DOA estimation DOA estimation in threshold region Higher order

statistics for DOA estimation Localization in sensor networks and direct position estimation Brings together in one book classical and modern DOA techniques, showing the connections between them Contains contributions from the leading people in the field Gives a concise and easy- to- read introduction to the classical techniques Evaluates the strengths and weaknesses of key super-resolution techniques Includes applications to sensor networks
Secure Your Wireless Networks the Hacking Exposed Way Defend against the latest pervasive and devastating wireless attacks using the tactical security information contained in this comprehensive volume. Hacking Exposed Wireless reveals how hackers zero in on susceptible networks and peripherals, gain access, and execute debilitating attacks. Find out how to plug security holes in Wi-Fi/802.11 and Bluetooth systems and devices. You'll also learn how to launch wireless exploits from Metasploit, employ bulletproof authentication and encryption, and sidestep insecure wireless hotspots. The book includes vital details on new, previously unpublished attacks alongside real-world countermeasures. Understand the concepts behind RF electronics, Wi-Fi/802.11, and Bluetooth Find out how hackers use NetStumbler, WiSPY, Kismet, KisMAC, and AiroPeek to target vulnerable wireless networks Defend against WEP key brute-force, aircrack, and traffic injection hacks Crack WEP at new speeds using Field Programmable Gate Arrays or your spare PS3 CPU cycles Prevent rogue AP and certificate authentication attacks Perform packet injection from Linux Launch DoS attacks using device driver-independent tools Exploit wireless device drivers using the Metasploit 3.0 Framework Identify and avoid malicious hotspots Deploy WPA/802.11i authentication and encryption using PEAP, FreeRADIUS, and WPA pre-shared keys
This book discusses the security issues in a wide range of wireless devices and systems, such as RFID, Bluetooth, ZigBee, GSM, LTE, and GPS. It collects the findings of recent research by the UnicornTeam at 360 Technology, and reviews the state-of-the-art literature on wireless security. The book also offers detailed case studies and theoretical treatments – specifically it lists numerous laboratory procedures, results, plots, commands and screenshots from real-world experiments. It is a valuable reference guide for practitioners and researchers who want to learn more about the advanced research findings and use the off-the-shelf tools to explore the wireless world.

FPGA-Based Software-Defined Radio and Its Real-Time Implementation Using NI-USRP

Hacking Exposed Linux

Classical and Modern Direction-of-Arrival Estimation

Implementing Directional Wireless Networks with Higher Modulation Techniques

Artificial Intelligence in Wireless Communications

Deploy your own private mobile network with OpenBTS, the open source software project that converts between the GSM and UMTS wireless radio interface and open IP protocols. With this hands-on, step-by-step guide, you'll learn how to use OpenBTS to construct simple, flexible, and inexpensive mobile networks with software. OpenBTS can distribute any internet connection as a mobile network across a large geographic region, and provide connectivity to remote devices in the Internet of Things. Ideal for telecom and software engineers new to this technology, this book helps you build a basic OpenBTS network with voice and SMS services and data capabilities. From there, you can create your own niche product or experimental feature. Select hardware, and set up a base operating system for your project Configure, troubleshoot, and use performance-tuning techniques Expand to a true multinode mobile network complete with Mobility and Handover Add general packet radio service (GPRS) data connectivity, ideal for IoT devices Build applications on top of the OpenBTS NodeManager control and event APIs
ARCHIE 3000 is the complete collection featuring the classic series. This is presented in the new higher-end format of Archie Comics Presents, which offers 200+ pages at a value while taking a design cue from successful all-ages graphic novels. Travel to the 31st Century with Archie and his friends! In the year 3000, Riverdale is home to hoverboards, intergalactic travel, alien life and everyone's favorite space case, Archie! Follow the gang as they encounter detention robots, teleporters, wacky fashion trends and much more. Will the teens of the future get in as much trouble as the ones from our time?