

# A Simple Sdr Receiver

A software radio is a radio whose channel modulation waveforms are defined in software. All wireless telephones are controlled by this software. Written by the leader in the field, this book covers the technology that will allow cellular telephones to greatly expand the types of data they can transmit.

This book describes the state-of-the-art in RF, analog, and mixed-signal circuit design for Software Defined Radio (SDR). It synthesizes for analog/RF circuit designers the most important general design approaches to take advantage of the most recent CMOS technology, which can integrate millions of transistors, as well as several real examples from the most recent research results.

Offering engineers a thorough examination of special, more advanced aspects of digital wideband receiver design, this practical book builds on fundamental resources on the topic, helping you gain a more comprehensive understanding of the subject. This in-depth volume presents a detailed look at a complete receiver design, including the encoder. Moreover, it discusses the detection of exotic signals and provides authoritative guidance on designing receivers used in electronic warfare. From frequency modulation and biphase shifting keys, to parameter encoders in electronic warfare receivers and the use of the simulation and probability density function to predict the false alarm parameter, this book focuses on critical topics and techniques that help you design digital wideband

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receivers for top performance. The authoritative reference is supported with over 310 illustrations and more than 180 equations.

This book examines signal processing techniques for cognitive radios. The book is divided into three parts: Part I, is an introduction to cognitive radios and presents a history of the cognitive radio (CR), and introduce their architecture, functionalities, ideal aspects, hardware platforms, and state-of-the-art developments. Dr. Jayaweera also introduces the specific type of CR that has gained the most research attention in recent years: the CR for Dynamic Spectrum Access (DSA). Part II of the book, Theoretical Foundations, guides the reader from classical to modern theories on statistical signal processing and inference. The author addresses detection and estimation theory, power spectrum estimation, classification, adaptive algorithms (machine learning), and inference and decision processes. Applications to the signal processing, inference and learning problems encountered in cognitive radios are interspersed throughout with concrete and accessible examples. Part III of the book, Signal Processing in Radios, identifies the key signal processing, inference, and learning tasks to be performed by wideband autonomous cognitive radios. The author provides signal processing solutions to each task by relating the tasks to materials covered in Part II. Specialized chapters then discuss specific signal processing algorithms required for DSA and DSS cognitive radios.

This unified 2001 treatment of game theory focuses on finding state-of-the-art solutions to issues surrounding

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the next generation of wireless and communications networks. The key results and tools of game theory are covered, as are various real-world technologies and a wide range of techniques for modeling, design and analysis.

An exciting new technology, described by the one who invented it. This is the first book dedicated to cognitive radio, a promising new technology that is poised to revolutionize the telecommunications industry with increased wireless flexibility. Cognitive radio technology integrates computational intelligence into software-defined radio for embedded intelligent agents that adapt to RF environments and user needs. Using this technology, users can more fully exploit the radio spectrum and services available from wireless connectivity. For example, an attempt to send a 10MB e-mail in a zone where carrier charges are high might cause a cognitive radio to alert its user and suggest waiting until getting to the office to use the LAN instead. Cognitive Radio Architecture examines an "ideal cognitive radio" that features autonomous machine learning, computer vision, and spoken or written language perception. The author of this exciting new book is the inventor of the technology and a leader in the field. Following his step-by-step introduction, readers can start building aware/adaptive radios and then make steps towards cognitive radio. After an introduction to adaptive, aware, and cognitive radio, the author develops three major themes in three sections: Foundations Radio Competence User Domain Competence The book makes the design principles of

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cognitive radio more accessible to students of teleinformatics, as well as to wireless communications systems developers. It therefore embraces the practice of cognitive radio as well as the theory. In particular, the publication develops a cognitive architecture that integrates disparate disciplines, including autonomous machine learning, computer vision, and language perception technologies. An accompanying CD-ROM contains the Java source code and compiled class files for applications developed in the book. In addition, for the convenience of the reader, Web resources introducing key concepts such as speech applications programmer interfaces (APIs) are included. Although still five to ten years away from full deployment, telecommunications giants and research labs around the world are already dedicating R&D to this new technology. Telecommunications engineers as well as advanced undergraduate and graduate students can learn the promising possibilities of this innovative technology from the one who invented it. Note: CD-ROM/DVD and other supplementary materials are not included as part of eBook file.

Examining the most important developments in highly integrated wireless RF front ends, this book describes and evaluates both active and passive solutions for on-chip high-Q filtering, and explores M-phase filters in depth. An accessible step-by-step approach is used to introduce everything an RF designer needs to know about these filters, including their various forms, principles of operation, and their performance against implementation-related imperfections. Real-world

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examples are described in depth, and detailed mathematical analyses demonstrate the practical quantification of pertinent circuit parameters.

Do you want to be able to receive satellite images using nothing but your computer, an old TV antenna, and a \$20 USB stick? Now you can. At last, the technology exists to turn your computer into a super radio receiver, capable of tuning in to FM, shortwave, amateur "ham," and even satellite frequencies, around the world and above it. Listen to police, fire, and aircraft signals, both in the clear and encoded. And with the book's advanced antenna design, there's no limit to the signals you can receive. Combine your desktop or laptop computer with easy-to-find, Software Defined Radio (SDR) equipment, and tune in a wide range of signals in no time at all. Then, go one step further by converting a Raspberry Pi into your own dedicated SDR device. SDR USB dongles are usually designed to receive and decode high-definition digital television broadcasts, but the rising popularity of SDR has led to several of these devices being specifically made for - and marketed to - the software radio crowd. With step-by-step instructions, you'll have no problem getting everything up and running on both Windows and Linux. The antenna is the final piece in the SDR puzzle: Which antenna do you use? What shape do you need? How big does it have to be? And where do you point it? Get all the answers you need and learn what's possible when it comes to picking out or building an antenna. And if you're not particularly handy, don't worry. You can use an old-school set of rabbit ear antennas without too much modification. Discover the

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fun of this growing hobby and then open your ears to the hidden signals that surround you. What You Need: You will need a relatively recent computer or laptop, running either Windows or Ubuntu Linux. You can also use a Raspberry Pi. All of the software necessary is free and open-source, and the book describes in detail where to get it and how to install it, depending on your operating system.

The first book to describe RF hardware design for white space applications, including both analog and digital approaches.

This book highlights recent advances and emerging technologies that utilize computational intelligence in signal processing, computing, imaging science, artificial intelligence, and their applications. It covers all branches of artificial intelligence and machine learning that are based on computation at some level, e.g. artificial neural networks, evolutionary algorithms, fuzzy systems, and automatic medical identification systems. Exploring recent trends in research and applications, the book offers a valuable resource for professors, researchers, and engineers alike.

"This book examines how wireless sensor nodes with cognitive radio capabilities can address these network challenges and improve the spectrum utilization, presenting a broader picture on the applications, architecture, challenges, and open research directions in the area of WSN research"--Provided by publisher.

In the span of a century, radio technology advanced from spark transmitters, through analog radios based on vacuum tubes to solid state radios to finally software defined radios where most of the transmit and receive functionalities are implemented as programs running on specialized microprocessors. In recent years, cognitive radio emerged,

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which combines a software-defined radio with an intelligent agent, and promises to deliver a new level of functionality. This new resource addresses cognitive radio design from the perspective of interoperability with an emphasis on waveform configuration for increased flexibility and enhanced performance. The book provides readers with an extensive discussion of the concept of interoperability, as well as discusses some of the languages that could potentially be used for exchanging descriptions of waveforms.

This new textbook in signals and systems provides a pedagogically rich approach to what can commonly be a mathematically dry subject. With features like historical notes, highlighted common mistakes, and applications in controls, communications, and signal processing, Chaparro helps students appreciate the usefulness of the techniques described in the book. Each chapter contains a section with MatLab applications. Pedagogically rich introduction to signals and systems using historical notes, pointing out "common mistakes", and relating concepts to realistic examples throughout to motivate learning the material Introduces both continuous and discrete systems early, then studies each (separately) in more depth later Extensive set of worked examples and homework assignments, with applications to controls, communications, and signal processing throughout Provides review of all the background math necessary to study the subject MatLab applications in every chapter

Software defined radio (SDR) is one of the most important topics of research, and indeed development, in the area of mobile and personal communications. SDR is viewed as an enabler of global roaming and as a unique platform for the rapid introduction of new services into existing live networks. It therefore promises mobile communication networks a major increase in flexibility and capability. SDR brings together two

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key technologies of the last decade - digital radio and downloadable software. It encompasses not only reconfiguration of the air interface parameters of handset and basestation products but also the whole mobile network, to facilitate the dynamic introduction of new functionality and mass-customised applications to the user's terminal, post-purchase. This edited book, contributed by internationally respected researchers and industry practitioners, describes the current technological status of radio frequency design, data conversion, reconfigurable signal processing hardware, and software issues at all levels of the protocol stack and network. The book provides a holistic treatment of SDR addressing the full breadth of relevant technologies - radio frequency design, signal processing and software - at all levels. As such it provides a solid grounding for a new generation of wireless engineers for whom radio design in future will assume dynamic flexibility as a given. In particular it explores

- \* The unique demands of SDR upon the RF subsystem and their implications for front end design methodologies
- \* The recent concepts of the 'digital front end' and 'parametrization'
- \* The role and key influence of data conversion technologies and devices within software radio, essential to robust product design
- \* The evolution of signal processing technologies, describing new architectural approaches
- \* Requirements and options for software download
- \* Advances in 'soft' protocols and 'on-the-fly' software reconfiguration
- \* Management of terminal reconfiguration and its network implications
- \* The concepts of the waveform description language

The book also includes coverage of

- \* Potential breakthrough technologies, such as superconducting RSFQ technology and the possible future role of MEMS in RF circuitry
- \* Competing approaches, eg all-software radios implemented on commodity computing vs advanced processing architectures that dynamically optimise

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their configuration to match the algorithm requirements at a point in time The book opens with an introductory chapter by Stephen Blust, Chair of the ITU-R WP8F Committee and Chair of the SDR Forum presenting a framework for SDR, in terms of definitions, evolutionary perspectives, introductory timescales and regulation. Suitable for today's engineers, technical staff and researchers within the wireless industry, the book will also appeal to marketing and commercial managers who need to understand the basics and potential of the technology for future product development. Its balance of industrial and academic contributors also makes it suitable as a text for graduate and post-graduate courses aiming to prepare the next generation of wireless engineers.

Compressive sensing is a new signal processing paradigm that aims to encode sparse signals by using far lower sampling rates than those in the traditional Nyquist approach. It helps acquire, store, fuse and process large data sets efficiently and accurately. This method, which links data acquisition, compression, dimensionality reduction and optimization, has attracted significant attention from researchers and engineers in various areas. This comprehensive reference develops a unified view on how to incorporate efficiently the idea of compressive sensing over assorted wireless network scenarios, interweaving concepts from signal processing, optimization, information theory, communications and networking to address the issues in question from an engineering perspective. It enables students, researchers and communications engineers to develop a working knowledge of compressive sensing, including background on the basics of compressive sensing theory, an understanding of its benefits and limitations, and the skills needed to take advantage of compressive sensing in wireless networks.

This two-volume book presents an unusually diverse

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selection of research papers, covering all major topics in the fields of information and communication technologies and related sciences. It provides a wide-angle snapshot of current themes in information and power engineering, pursuing a cross-disciplinary approach to do so. The book gathers revised contributions that were presented at the 2018 International Conference: Sciences of Electronics, Technologies of Information and Telecommunication (SETIT'18), held on 20–22 December 2018 in Hammamet, Tunisia. This eighth installment of the event attracted a wealth of submissions, and the papers presented here were selected by a committee of experts and underwent additional, painstaking revision. Topics covered include: · Information Processing · Human-Machine Interaction · Computer Science · Telecommunications and Networks · Signal Processing · Electronics · Image and Video This broad-scoped approach is becoming increasingly popular in scientific publishing. Its aim is to encourage scholars and professionals to overcome disciplinary barriers, as demanded by current trends in the industry and in the consumer market, which are rapidly leading toward a convergence of data-driven applications, computation, telecommunication, and energy awareness. Given its coverage, the book will benefit graduate students, researchers and practitioners who need to keep up with the latest technological advances.

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

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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

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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 .

In recent years, a considerable amount of effort has been devoted, both in industry and academia, towards the efficient utilization of the available spectrum under the various propagation models which lead towards the design and dimensioning of the future network Internet of Things (IoT). This book focuses on Television White Space (TVWS) opportunities and regulatory aspects for cognitive radio applications, and includes case studies for the exploitation of TVWS depending on user's mobility, and the geo-location between user and the Base Station. The book presents recent advances in spectrum sensing, reflecting state of the art technology and research achievements in this area as well as a new insights in spectrum sensing of performance modeling, analysis and worldwide applications. Technical topics discussed include: Novel Application of TV White Space Spectrum Sensing in Cognitive Radio Cooperative Spectrum

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### SensingDoA Estimation Algorithms

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.

This book constitutes the refereed proceedings of the 17th International Workshop on Cryptographic Hardware and Embedded Systems, CHES 2015, held in Saint Malo, France, in September 2015. The 34 full papers included in this volume were carefully reviewed and selected from 128 submissions. They are organized in the following topical sections: processing techniques in side-channel analysis;

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cryptographic hardware implementations; homomorphic encryption in hardware; side-channel attacks on public key cryptography; cipher design and cryptanalysis; true random number generators and entropy estimations; side-channel analysis and fault injection attacks; higher-order side-channel attacks; physically unclonable functions and hardware trojans; side-channel attacks in practice; and lattice-based implementations.

### Publisher description

This book gives a thorough knowledge of cognitive radio concepts, principles, standards, spectrum policy issues and product implementation details. In addition to 16 chapters covering all the basics of cognitive radio, this new edition has eight brand-new chapters covering cognitive radio in multiple antenna systems, policy language and policy engine, spectrum sensing, rendezvous techniques, spectrum consumption models, protocols for adaptation, cognitive networking, and information on the latest standards, making it an indispensable resource for the RF and wireless engineer. The new edition of this cutting edge reference, which gives a thorough knowledge of principles, implementation details, standards, policy issues in one volume, enables the RF and wireless engineer to master and apply today's cognitive radio technologies. Bruce Fette, PhD, is Chief Scientist in the Communications Networking Division of General Dynamics C4

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Systems in Scottsdale, AZ. He worked with the Software Defined Radio (SDR) Forum from its inception, currently performing the role of Technical Chair, and is a panelist for the IEEE Conference on Acoustics Speech and Signal Processing Industrial Technology Track. He currently heads the General Dynamics Signal Processing Center of Excellence in the Communication Networks Division. Dr. Fette has 36 patents and has been awarded the "Distinguished Innovator Award".

- \* Foreword and a chapter contribution by Joe Mitola, the creator of the field
- \* Discussion of cognitive aids to the user, spectrum owner, network operator
- \* Explanation of capabilities such as time – position awareness, speech and language awareness, multi-objective radio and network optimization, and supporting database infrastructure
- \* Detailed information on product implementation to aid product developers
- \* Thorough descriptions of each cognitive radio component technology provided by leaders of their respective fields, and the latest in high performance analysis – implementation techniques
- \* Explanations of the complex architecture and terminology of the current standards activities
- \* Discussions of market opportunities created by cognitive radio technology

This book presents a broad range of deep-learning applications related to vision, natural language processing, gene expression, arbitrary object recognition, driverless cars, semantic image

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segmentation, deep visual residual abstraction, brain–computer interfaces, big data processing, hierarchical deep learning networks as game-playing artefacts using regret matching, and building GPU-accelerated deep learning frameworks. Deep learning, an advanced level of machine learning technique that combines class of learning algorithms with the use of many layers of nonlinear units, has gained considerable attention in recent times. Unlike other books on the market, this volume addresses the challenges of deep learning implementation, computation time, and the complexity of reasoning and modeling different type of data. As such, it is a valuable and comprehensive resource for engineers, researchers, graduate students and Ph.D. scholars. Green Software De?ned Radios, the title of this book may have originated from a lackofinspiration, andthe combinationofhardwork, jetlag, anddrinkinggreentea. The message we want to convey however, is that SDRs are a promising technology for the future, providing they are designed for ef?cient usage of scarce resources: energy and spectrum. In the last years, the R&D teams focusing on wireless communication (around the world and at IMEC speci?cally), have realized great breakthroughs. It is our honor, building on this knowledge, to bring a comprehensive overview of the essential technologies. We are grateful that Springer is willing to publish in their collection on radio technologies, a

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book on green SDRs, a weird species still today, yet maybe the baseline for the day after tomorrow. Dear reader, we wish that you find in the following pages, including the references, some interesting insights, and that this book may live more or less up to your expectations (and hopefully more than less). This book's closing states that the quest for Green SDRs has not ended, this is just the beginning. Concerning this book however, we are happy that today the opposite is true. We want to acknowledge our colleagues at IMEC for their great scientific contribution, and even more for the enjoyable cooperation.

Over 80 recipes to master IoT security techniques. About This Book Identify vulnerabilities in IoT device architectures and firmware using software and hardware pentesting techniques Understand radio communication analysis with concepts such as sniffing the air and capturing radio signals A recipe based guide that will teach you to pentest new and unique set of IoT devices. Who This Book Is For This book targets IoT developers, IoT enthusiasts, pentesters, and security professionals who are interested in learning about IoT security. Prior knowledge of basic pentesting would be beneficial. What You Will Learn Set up an IoT pentesting lab Explore various threat modeling concepts Exhibit the ability to analyze and exploit firmware vulnerabilities Demonstrate the automation of application binary analysis for iOS and Android using MobSF Set up a Burp Suite and use it for web app testing Identify UART and JTAG pinouts, solder headers, and hardware debugging Get solutions to common wireless protocols Explore the mobile security and firmware best practices Master various advanced IoT exploitation techniques and security automation In Detail IoT is an

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upcoming trend in the IT industry today; there are a lot of IoT devices on the market, but there is a minimal understanding of how to safeguard them. If you are a security enthusiast or pentester, this book will help you understand how to exploit and secure IoT devices. This book follows a recipe-based approach, giving you practical experience in securing upcoming smart devices. It starts with practical recipes on how to analyze IoT device architectures and identify vulnerabilities. Then, it focuses on enhancing your pentesting skill set, teaching you how to exploit a vulnerable IoT device, along with identifying vulnerabilities in IoT device firmware. Next, this book teaches you how to secure embedded devices and exploit smart devices with hardware techniques. Moving forward, this book reveals advanced hardware pentesting techniques, along with software-defined, radio-based IoT pentesting with Zigbee and Z-Wave. Finally, this book also covers how to use new and unique pentesting techniques for different IoT devices, along with smart devices connected to the cloud. By the end of this book, you will have a fair understanding of how to use different pentesting techniques to exploit and secure various IoT devices.

**Style and approach** This recipe-based book will teach you how to use advanced IoT exploitation and security automation. Summarizes cutting-edge physical layer technologies for multi-mode wireless RF transceivers. Includes original contributions from distinguished researchers and professionals. Covers cutting-edge physical layer technologies for multi-mode wireless RF transceivers. Contributors are all leading researchers and professionals in this field.

**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 a project, practicing engineers, technical managers, and graduate students can

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save countless hours by considering the concepts presented in these pages. The author covers the myriad options and trade-offs available when selecting 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 bogging down in endless 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: Choosing the right architecture for the market – laboratory, military, or commercial, Hardware platforms – FPGAs, GPPs, specialized and hybrid devices, Standardization efforts to ensure interoperability and portability State-of-the-art components for radio frequency, mixed-signal, and baseband processing. The text requires only minimal knowledge of wireless communications; whenever possible, qualitative arguments are used instead of equations. An 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, this book is sure to be an invaluable addition to any technical bookshelf.

Software Defined Radio Using MATLAB & Simulink and the RTL-SDR

"This unique resource provides you with a practical approach to quickly learning the software-defined radio concepts you need to know for your work in the field. By prototyping and evaluating actual digital communication systems capable of performing "over-the-air" wireless data transmission and reception, this volume helps you attain a first-hand understanding of critical design trade-offs and issues.

Moreover you gain a sense of the actual "real-world" operational behavior of these systems. With the purchase of the book, you gain access to several ready-made Simulink

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experiments at the publisher's website. This collection of laboratory experiments, along with several examples, enables you to successfully implement the designs discussed the book in a short period of time. These files can be executed using MATLAB version R2011b or later. "

The availability of the RTL-SDR device for less than \$20 brings software defined radio (SDR) to the home and work desktops of EE students, professional engineers and the maker community. The RTL-SDR can be used to acquire and sample RF (radio frequency) signals transmitted in the frequency range 25MHz to 1.75GHz, and the MATLAB and Simulink environment can be used to develop receivers using first principles DSP (digital signal processing) algorithms. Signals that the RTL-SDR hardware can receive include: FM radio, UHF band signals, ISM signals, GSM, 3G and LTE mobile radio, GPS and satellite signals, and any that the reader can (legally) transmit of course! In this book we introduce readers to SDR methods by viewing and analysing downconverted RF signals in the time and frequency domains, and then provide extensive DSP enabled SDR design exercises which the reader can learn from. The hands-on SDR design examples begin with simple AM and FM receivers, and move on to the more challenging aspects of PHY layer DSP, where receive filter chains, real-time channelisers, and advanced concepts such as carrier synchronisers, digital PLL designs and QPSK timing and phase synchronisers are implemented. In the book we will also show how the RTL-SDR can be used with SDR transmitters to develop complete communication systems, capable of transmitting payloads such as simple text strings, images and audio across the lab desktop.

This book constitutes the proceedings of the 15th IFIP TC8 International Conference on Computer Information Systems and Industrial Management, CISIM 2016, held in Vilnius,

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Lithuania, in September 2016. The 63 regular papers presented together with 1 invited paper and 5 keynotes in this volume were carefully reviewed and selected from about 89 submissions. The main topics covered are rough set methods for big data analytics; images, visualization, classification; optimization, tuning; scheduling in manufacturing and other applications; algorithms; decisions; intelligent distributed systems; and biometrics, identification, security.

In recent years there has been many developments in communication technology. This has greatly enhanced the computing power of small handheld resource-constrained mobile devices. Different generations of communication technology have evolved. This had led to new research for communication of large volumes of data in different transmission media and the design of different communication protocols. Another direction of research concerns the secure and error-free communication between the sender and receiver despite the risk of the presence of an eavesdropper. For the communication requirement of a huge amount of multimedia streaming data, a lot of research has been carried out in the design of proper overlay networks. The book addresses new research techniques that have evolved to handle these challenges.

SDR (Software-Defined Radio) is a generic term for a device that includes a full radio tuner in a "black box" with few or no external controls. All the tuning and output must be controlled through an external computer. This book covers the installation, setup, and operation of one particular very popular and inexpensive SDR device, the SDRplay, and the manufacturer's version of the SDR software, called SDRUno. The SDRplay has an enormous range of

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frequencies available, including those for amateur radio, broadcast radio, satellite communication, TV, microwave, and a vast array of other frequencies. Being receive-only, no special licenses are required; although it is very popular with amateur radio enthusiasts ("Hams"), anyone with appropriate computer equipment can buy and use an SDRplay. Inside you'll find step-by-step tutorials on how to install the software, setup the device, and use your SDRplay. SDR has never been more accessible! This short book gives you a simple step-by-step walkthrough of all the options to set up your SDR receiver using many screenshots and examples. The entire process is detailed, from registering your device to installing the software, and more. Once that's done, you can start listening and scanning the airways for audio and digital signals!

This book constitutes the thoroughly refereed post-conference proceedings of the Second International ICST Conference on Personal Satellite Services, PSATS 2010, held in Rome, Italy, February 2010. The conference included a keynote speech, 4 regular technical tracks and 4 special sessions consisting of 33 high-quality scientific papers. These cover various topics such as Satellite Communications: Coding and Modulations, Multimedia Integration, Satellite Network: Quality of Service and Architectures and Applications and Services, as well as Delay-Tolerant Networks,

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Quantum Satellite Communications, Access Quality Processing and Applications of Satellite Imagery.

The book covers a wide range of wireless communication and network technologies, and will help readers understand the role of wireless technologies in applications touching on various spheres of human life, e.g. healthcare, agriculture, building smart cities, forecasting and the manufacturing industry. The book begins by discussing advances in wireless communication, including emerging trends and research directions for network technologies. It also highlights the importance of and need to actively develop these technologies. In turn, the book addresses different algorithms and methodologies which could be beneficial in implementing 5G Mobile

Communication, Vehicular Ad-hoc Networks (VANET), Reliable Cooperative Networks, Delay Tolerant Networks (DTN) and many more contexts related to advanced communications. It then addresses the prominence of wireless communication in connection with the Internet of Things (IoT), Mobile Opportunistic Networks and Cognitive Radio Networks (CRN). Lastly, it presents the new horizons in architecture and building protocols for Li-Fi (Light-Fidelity) and Wearable Sensor Technology.

This book presents cutting-edge research contributions that address various aspects of

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network design, optimization, implementation, and application of cognitive radio technologies. It demonstrates how to make better utilization of the available spectrum, cognitive radios and spectrum access to achieve effective spectrum sharing between licensed and unlicensed users. The book provides academics and researchers essential information on current developments and future trends in cognitive radios for possible integration with the upcoming 5G networks. In addition, it includes a brief introduction to cognitive radio networks for newcomers to the field.

The novel coronavirus disease 2019 (COVID-19) pandemic has posed a major threat to human life and health. This book is beneficial for interdisciplinary students, researchers, and professionals to understand COVID-19 and how computational intelligence can be used for the purpose of surveillance, control, prevention, prediction, diagnosis, and potential treatment of the disease. The book contains different aspects of COVID-19 that includes fundamental knowledge, epidemic forecast models, surveillance and tracking systems, IoT- and IoMT-based integrated systems for COVID-19, social network analysis systems for COVID-19, radiological images (CT, X-ray) based diagnosis system, and computational intelligence and in silico drug design and drug repurposing methods against COVID-19 patients. The

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contributing authors of this volume are experts in their fields and they are from various reputed universities and institutions across the world. This volume is a valuable and comprehensive resource for computer and data scientists, epidemiologists, radiologists, doctors, clinicians, pharmaceutical professionals, along with graduate and research students of interdisciplinary and multidisciplinary sciences.

This book constitutes the proceedings of the 16th International Conference on Detection of Intrusions and Malware, and Vulnerability Assessment, DIMVA 2019, held in Gothenburg, Sweden, in June 2019. The 23 full papers presented in this volume were carefully reviewed and selected from 80 submissions. The contributions were organized in topical sections named: wild wild web; cyber-physical systems; malware; software security and binary analysis; network security; and attack mitigation.

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