Digital Front End In Wireless Communications And Broadcasting Circuits And Signal Processing

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Digital Front End In Wireless
From setups for small spaces to super-powered subwoofers, these are our picks for the best home theater sound, without all those pesky wires.

7 Best Wireless Surround Sound Systems for Every Budget
Verizon Communications reported growth in 5G adoption, broadband subscribers and business applications during a presentation to investors Wednesday (Oct. 20).

Verizon Reports More Than 25% of Consumer Accounts Have 5G-Capable Device
It's nearly impossible to find any flaws with the $200 Jabra Elite 7 Pro true wireless earbuds, which offer exceptional comfort and a huge array of features.

Jabra Elite 7 Pro
Many now contain built-in digital ... digital front: you get three analogue line-level inputs, including a balanced XLR, alongside a quartet of physical digital connections. There's a choice of USB, ...

Best stereo amplifiers 2021: best integrated amps for every budget
JESD207 is a Radio Front End – Base Band Digital Parallel (RBDP) interface between a Radio Front-end integrated circuit (RFIC) and a Baseband integrated circuit (BBIC). This IP core together ...

Lattice Wireless Communication IP Core
COMSovereign Holding Corp. ("COMSovereign" or the "Company"), a U.S.-based developer of 4G LTE Advanced and 5G Communication Systems and Solutions and Total Network Solutions ("TNS"), a developer of ...

COMSovereign and TNS Advance Wireless Infrastructure Security Utilizing the Blockchain for Mobile Electronic Device Verification
Also: Verizon Q2 strong amid 5G wireless ... by the digital baseband processor. The same process happens in reverse when

a device is transmitting, sending the signal to the front-end RF IC ...

5G isn't quite there, and MixComm believes it has the millimeter wave fix
This compact low-power Analog Front- End has been designed for wireless systems as the baseband part of the solution. The AFE consists of two ADC IQ pairs, two DAC IQ pairs, one auxiliary ADC ... The ...

Wireless IP Listing
Currently, I'm invested in Digital Payments/Fintech ... Qualcomm expects that combined revenues across IoT, RF front-end and automotive to be around $10 billion in FY 2021, or about 30% of ...

Qualcomm: A Great 5G And IoT Play, But Beware Potential Headwinds
Corsair's mouse has a few perks on that front ... 110 like the Sabre Pro Wireless — but the M65 still feels a step ahead of the competition. Yes, several. For high-end, wireless FPS mice ...

Corsair M65 RGB Ultra Wireless review: An FPS icon goes wireless
Pyronix is pleased to announce the release of its indoor siren with combined courtesy light, the mains-powered wireless SPEAKER/SOUNDER-WE. Replicating the tones of the control panel, ...

Pyronix announces the release of their wireless SPEAKER/SOUNDER-WE indoor siren
We'll explain all the latest soundbar technology, show you the most important features you should look for, and name our top picks in budget, mid-range, and high-end categories. We'll also ...

Best soundbars to improve your TV's audio
Zyter, Inc., a leading digital health and IoT-enablement platform ... Zyter's SmartSpaces™ platform, analytics and front-end dashboard is being integrated with Everguard's Sentri360® AI platform, made ...

Zyter Collaborates with Zurich North America, Qualcomm and Everguard to Enhance Construction Safety
While a tweak of the frame here, or the ongoing argument about which width or pressure of tyre is best, is ongoing, there's a fundamental shift in one aspect of bikes underway - the drivetrain. We've ...

Riding with SRAM Rival eTap AXS shifting: Is the future of bikes wireless?
Soundbars have become an integral part of home entertainment setups, hot on the heels of smart TVs in a pandemic-induced spike in the demand. Content consumption on OTT platforms as well as ...

Best soundbars for TV, movies and music in India in 2021
The end markets driving this strength are ... and other handheld products, wireless charging, set-top boxes, digital televisions, monitors and displays, digital video recorders and other consumer ...

Covering everything from signal processing algorithms to integrated circuit design, this complete guide to digital front-end is invaluable for professional engineers and researchers in the fields of signal processing, wireless communication and circuit design. Showing how theory is translated into practical technology, it covers all the relevant standards and gives readers the ideal design methodology to manage a rapidly increasing range of applications. Step-by-step information for designing practical systems is provided, with a systematic presentation of theory, principles, algorithms, standards and implementation. Design trade-offs are also included, as are practical implementation examples from real-world systems. A broad range of topics is covered, including digital pre-distortion (DPD), digital up-conversion (DUC), digital down-conversion (DDC) and DC-offset calibration. Other important areas discussed are peak-to-average power ratio (PAPR) reduction, crest factor reduction (CFR), pulse-shaping, image rejection, digital mixing, delay/gain/imbalance compensation, error correction, noise-shaping, numerical controlled oscillator (NCO) and various diversity methods.

The desire to build lower cost analog front-ends has triggered interest in a new domain of research. Consequently the joint design of the analog front-end and of the digital baseband algorithms has become an important field of research. It enables the wireless systems and chip designers to more effectively trade the communication performance with the production cost. Digital Compensation for Analog Front-Ends provides a systematic approach to designing a digital communication system. It covers in detail the digital compensation of many non-idealities, for a wide class of emerging broadband standards and with a system approach in the design of the receiver algorithms. In particular, system strategies for joint

estimation of synchronization and front-end non-ideality parameters are emphasized. The book is organized to allow the reader to gradually absorb the important information and vast quantity of material on this subject. The first chapter is a comprehensive introduction to the emerging wireless standards which is followed by a detailed description of the front-end non-idealities in chapter two. Chapter three then uses this information to explore what happens when the topics introduced in the first two chapters are merged. The book concludes with two chapters providing an in-depth coverage of the estimation and compensation algorithms. This book is a valuable reference for wireless system architects and chip designers as well as engineers or managers in system design and development. It will also be of interest to researchers in industry and academia, graduate students and wireless network operators. Presents a global, systematic approach to the joint design of the analog front-end compensation, channel estimation, synchronization and of the digital baseband algorithms Describes in depth the main front-end non-idealities such as phase noise, IQ imbalance, non-linearity, clipping, quantization, carrier frequency offset, sampling clock offset and their impact on the modulation Explains how the non-idealities introduced by the analog front-end elements can be compensated digitally Methodologies are applied to the emerging Wireless Local Area Network and outdoor Cellular communication systems, hence covering OFDM(A), SC-FDE and MIMO Written by authors with in-depth expertise developed in the wireless research group of IMEC and projects covering the main broadband wireless standards

This book describes the design of fully digital multistandard transmitter front-ends which can directly drive one or more switching power amplifiers, thus eliminating all other analog components. After reviewing different architectures, the authors focus on polar architectures using pulse width modulation (PWM), which are entirely based on unclocked delay lines and other continuous-time digital hardware. As a result, readers are enabled to shift accuracy concerns from the voltage domain to the time domain, to coincide with submicron CMOS technology scaling. The authors present different architectural options and compare them, based on their effect on the signal and spectrum quality. Next, a high-level theoretical analysis of two different PWM-based architectures – baseband PWM and RF PWM – is made. On the circuit level, traditional digital components and design techniques are revisited from the point of view of continuous-time digital circuits. Important design criteria are identified and different solutions are presented, along with their advantages and disadvantages. Finally, two chips designed in nanometer CMOS technologies are described, along with measurement results for validation.

A comprehensive review to the theory, application and research of machine learning for future wireless communications In one single volume, Machine Learning for Future Wireless Communications provides a comprehensive and highly accessible treatment to the theory, applications and current research developments to the technology aspects related to machine learning for wireless communications and networks. The technology development of machine learning for wireless communications has grown explosively and is one of the biggest trends in related academic, research and industry communities. Deep neural networks-based machine learning technology is a promising tool to attack the big challenge in

wireless communications and networks imposed by the increasing demands in terms of capacity, coverage, latency, efficiency flexibility, compatibility, quality of experience and silicon convergence. The author – a noted expert on the topic – covers a wide range of topics including system architecture and optimization, physical-layer and cross-layer processing, air interface and protocol design, beamforming and antenna configuration, network coding and slicing, cell acquisition and handover, scheduling and rate adaption, radio access control, smart proactive caching and adaptive resource allocations. Uniquely organized into three categories: Spectrum Intelligence, Transmission Intelligence and Network Intelligence, this important resource: Offers a comprehensive review of the theory, applications and current developments of machine learning for wireless communications and networks Covers a range of topics from architecture and optimization to adaptive resource allocations Reviews state-of-the-art machine learning based solutions for network coverage Includes an overview of the applications of machine learning algorithms in future wireless networks Explores flexible backhaul and front-haul, cross-layer optimization and coding, full-duplex radio, digital front-end (DFE) and radio-frequency (RF) processing Written for professional engineers, researchers, scientists, manufacturers, network operators, software developers and graduate students, Machine Learning for Future Wireless Communications presents in 21 chapters a comprehensive review of the topic authored by an expert in the field.

Wireless Receiver Architectures and Design presents the various designs and architectures of wireless receivers in the context of modern multi-mode and multi-standard devices. This one-stop reference and guide to designing low-cost low-power multi-mode, multi-standard receivers treats analog and digital signal processing simultaneously, with equal detail given to the chosen architecture and modulating waveform. It provides a complete understanding of the receiver's analog front end and the digital backend, and how each affects the other. The book explains the design process in great detail, starting from an analysis of requirements to the choice of architecture and finally to the design and algorithm development. The advantages and disadvantages of each wireless architecture and the suitability to a standard are given, enabling a better choice of design methodology, receiver lineup, analog block, and digital algorithm for a particular architecture. Whether you are a communications engineer working in system architecture and waveform design, an RF engineer working on noise and linearity budget and line-up analysis, a DSP engineer working on algorithm development, or an analog or digital design engineer designing circuits for wireless transceivers, this book is your one-stop reference and guide to designing low-cost low-power multi-mode multi-standard receivers. The material in this book is organized and presented to lead you from applied theory to practical design with plenty of examples and case studies drawn from modern wireless standards. Provides a complete description of receiver architectures together with their pros and cons, enabling a better choice of design methodology Covers the design trade-offs and algorithms between the analog front end and the digital modem – enabling an end-to-end design approach Addresses multi-mode multi-standard low-cost, low-power radio design – critical for producing the applications for Smart phones and portable internet devices

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 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 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.

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.

This is one of the first books on the emerging research topic of digital compensation of RF imperfections. The book presents a new multidisciplinary vision on the design of wireless communication systems. In this approach the imperfections of the RF front-ends are accepted and digital signal processing algorithms are designed to suppress their impact on system

performance. The book focuses on multiple-antenna orthogonal frequency division multiplexing (MIMO OFDM).

This book introduces a new intuitive design methodology for the optimal design path for next-generation software defined radio front-ends (SDRXs). The methodology described empowers designers to "attack" the multi-standard environment in a parallel way rather than serially, providing a critical tool for any design methodology targeting 5G circuits and systems. Throughout the book the SDRX design follows the key wireless standards of the moment (i.e., GSM, WCDMA, LTE, Bluetooth, WLAN), since a receiver compatible with these standards is the most likely candidate for the first design iteration in a 5G deployment. The author explains the fundamental choice the designer has to make regarding the optimal channel selection: how much of the blockers/interferers will be filtered in the analog domain and how much will remain to be filtered in the digital domain. The system-level analysis the author describes entails the direct sampling architecture is treated as a particular case of mixer-based direct conversion architecture. This allows readers give a power consumption budget to determine how much filtering is required on the receive path, by considering the ADC performance characteristics and the corresponding blocker diagram.

The world of wireless communications is changing very rapidly since a few years. The introduction of digital data communication in combination with digital signal process ing has created the foundation for the development of many new wireless applications. High-quality digital wireless networks for voice communication with global and local coverage, like the GSM and DECT system, are only faint and early examples of the wide variety of wireless applications that will become available in the remainder of this decade. The new evolutions in wireless communications set new requirements for the trans ceivers (transmitter-receivers). Higher operating frequencies, a lower power consump tion and a very high degree of integration, are new specifications which ask for design approaches quite different from the classical RF design techniques. The integrata bility and power consumption reduction of the digital part will further improve with the continued downscaling of technologies. This is however completely different for the analog transceiver front-end, the part which performs the interfacing between the antenna and the digital signal processing. The analog front-end's integratability and power consumption are closely related to the physical limitations of the transceiver topology and not so much to the scaling of the used technology. Chapter 2 gives a detailed study of the level of integration in current transceiver realization and analyzes their limitations. In chapter 3 of this book the complex signal technique for the analysis and synthesis of multi-path receiver and transmitter topologies is introduced.

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