Digital Signal Processing Emmanuel Ifeachor

This book clearly explains digital signal processing principles and shows how they can be used to build DSP systems. The aim is to give enough insight and practical guidance to enable an engineer to construct DSP systems. The book's programs are written in C, the language used in DSP.

dieses Buch bietet eine leicht verständliche Einführung in Signale und Systeme für zeitinvariante Systeme, die im Grundstudium unter verschiedenen Namen gelehrt werden (z. B. Systemtheorie). Durch die Einbindung zahlreicher praktischer Beispiele, in denen die leistungsfähige MATLAB®-Software eingesetzt wird, ergänzt das Werk auch Vorlesungen mit theoretischem Schwerpunkt. Im Gegensatz zu vielen Konkurrenzwerken verwendet dieses Buch außerdem die Simulink®-Erweiterung. Aus den Simulink®-Modellen können automatisch C-Programme erzeugt werden, was für die industrielle Entwicklung sehr wichtig ist.

Introduction to Audio Analysis serves as a standalone introduction to audio analysis, providing theoretical background to many state-of-the-art techniques. It covers the essential theory necessary to develop audio engineering applications, but also uses programming techniques, notably MATLAB®, to take a more applied approach to the topic. Basic theory and reproducible experiments are combined to demonstrate theoretical concepts from a practical point of view and provide a solid foundation in the field of audio analysis. Audio feature extraction, audio classification, audio segmentation, and music information retrieval are all addressed in detail, along with material on basic audio processing and frequency domain representations and filtering. Throughout the text, reproducible MATLAB® examples are accompanied by theoretical descriptions, illustrating how concepts and equations can be applied to the development of audio analysis systems and components. A blend of reproducible MATLAB® code and essential theory provides enable the reader to delve into the world of audio signals and develop real-world audio applications in various domains. Practical approach to signal processing: The first book to focus on audio analysis from a signal processing perspective, demonstrating practical implementation alongside theoretical concepts Bridge the gap between theory and practice: The authors demonstrate how to apply equations to real-life code examples and resources, giving you the technical skills to develop real-world applications Library of MATLAB code: The book is accompanied by a well-documented library of MATLAB functions and reproducible experiments

Bridging the gap from theory to programming, Designing Software Synthesizer Plug-Ins in C++ For RackAFX, VST3 and Audio Units contains complete code for designing and implementing software synthesizers for both Windows and Mac platforms. You will learn synthesizer operation, starting with the underlying theory of each synthesizer component, and moving on to the theory of how these components combine to form fully working musical instruments that function on a variety of target digital audio workstations (DAWs). Containing some of the latest advances in theory and algorithm development, this book contains information that has never been published in textbook form, including several unique algorithms of the author's own design. The book is broken into three parts: plug-in programming, theory and design of the central synthesizer components of oscillators, envelope generators, and filters, and the design and implementation of six complete polyphonic software synthesizer musical instruments, which can be played in real time. The instruments implement advanced concepts including a user-programmable modulation matrix. The final chapter shows you the theory and code for a suite of delay effects to augment your synthesizers, introducing you to audio effect processing. The companion website, www.focalpress.com/cw/pirkle, gives you access to free software to guide you through the application of concepts discussed in the book, and code for both Windows and Mac platforms. In addition to the software, it features bonus projects, application notes, and video tutorials. A reader forum, monitored by the author, gives you the opportunity for questions and information exchange.

The Only DSP Book 100% Focused on Step-by-Step Design and Implementation of Real Devices and Systems in Hardware and Software Practical Applications in Digital Signal Processing is the first DSP title to address the area that even the excellent engineering textbooks of today tend to omit. This book fills a large portion of that omission by addressing circuits and system applications that most design engineers encounter in the modern signal processing industry. This book includes original work in the areas of Digital Data Locked Loops (DLLs), Digital Automatic Gain Control (dAGC), and the design of fast elastic store memory used for synchronizing independently clocked asynchronous data bit streams. It also contains detailed design discussions on Cascaded Integrator Comb (CIC) filters, including the seldom-covered topic of bit pruning. Other topics not extensively covered in other modern textbooks, but detailed here, include analog and digital signal tuning, complex-to-real conversion, the design of digital channelizers, and the techniques of digital frequency synthesis. This book also contains an appendix devoted to the techniques of writing mixed-language C\C++ Fortran programs. Finally, this book contains very extensive review material covering important engineering mathematical tools such as the Fourier series, the Fourier transform, the z transform, and complex variables. Features of this book include • Thorough coverage of the complex-to-real conversion of digital signals • A complete tutorial on digital frequency synthesis • Lengthy discussion of analog and digital tuning and signal translation • Detailed coverage of the design of elastic store memory • A comprehensive study of the design of digital data locked loops • Complete coverage of the design of digital channelizers • A detailed treatment on the design of digital automatic gain control • Detailed techniques for the design of digital and multirate filters • Extensive coverage of the CIC filter, including the topic of bit pruning • An extensive review of complex variables • An extensive review of the Fourier series, and continuous and discrete Fourier transforms • An extensive review of the z transform

PSpice for Digital Communications Engineering shows how to simulate digital communication systems and modulation methods using the very powerful Cadence Orcad PSpice version 10.5 suite of software programs. Fourier series and Fourier transform are applied to signals to set the ground work for the modulation techniques introduced in later chapters. Various baseband signals, including duo-binary baseband signaling, are generated and the spectra are examined to detail the unsuitability of these signals for accessing the public switched network. Pulse code modulation and time-division multiplexing circuits are examined and simulated where sampling and quantization noise topics are discussed. We construct a single-channel PCM system from transmission to receiver i.e. end-to-end, and import real speech signals to examine the problems associated with aliasing, sample and hold.Companding is addressed here and we look at the A and mu law characteristics for achieving better signal to quantization noise ratios. Several types of delta modulators are examined and also the concept of time divisionmultiplexing is considered. Multi-level signaling techniques such as QPSK andQAMare analyzed and simulated and â€˜home-made metersâ€™, such as scatter and eye meters, are used to assess the performance of these modulation systems in the presence of noise. The raised-cosine family of filters for shaping data before transmission is examined in depth where bandwidth efficiency and channel capacity is discussed. We plot several graphs in Probe to compare the efficiency of these systems. Direct spread spectrum is the last topic to be examined and simulated to show the advantages of spreading the signal over a wide bandwidth and giving good signal security at the same time.

Seit vierzig Jahren vermittelt das Standardwerk Wissenschaftlern, Praktikern und Studierenden Grundlagen der professionellen, wissenschaftlich fundierten Informationsarbeit. Mit der 6., völlig neu gefassten Auflage reagieren die Herausgeber Rainer Kuhlen, Wolfgang Semar und Dietmar Strauch auf die erheblichen technischen, methodischen und organisatorischen Veränderungen auf dem Gebiet der Information und Dokumentation und tragen damit der raschen Entwicklung des Internets und der Informationswissenschaft Rechnung. Die insgesamt über fünfzig Beiträge

sind vier Teilen - Grundlegendes (A), Methodisches (B), Informationsorganisation (C) und Informationsinfrastrukturen (D) - zugeordnet. Artikel aus der 5. Auflage, die in der 6. Auflage nicht mehr enthalten und nach wie vor relevant bleiben, sind über die Website des Verlags frei zugänglich: Folgen Sie hierzu dem folgenden Link und erfahren Sieunter Zusatzmaterialien OpenAccess, welche Artikel dieser Regelung folgen: http://www.degruyter.com/view/product/53242

Explores recent innovations in information and data storage technology.

Das vorliegende Buch stellt einige grundlegende Themen der Multirate Systeme, Filterbänke und Wavelets mit Hilfe der MATLAB/Simulink Software nach dem Motto "Mit Logik wird bewiesen, mit Intuition wird erfunden" (Henri Poincare) dar. Diesen Gedanken haben die Autoren auch in den vorherigen Büchern "Signalverarbeitung mit MATLAB und Simulink" und "Einführung in Signale und Systeme", verfolgt. Die Themen sind so gegliedert, dass sie zuerst intuitiv mit Bildern eingeführt werden, danach werden mathematische Behandlungen gezeigt und schließlich mit anschaulichen Simulationen in MATLAB/Simulink verständlich ergänzt. Die Simulationen ermöglichen anspruchsvolle mathematische Beweisführungen zu umgehen. Die praktischen Simulationsbeispielen, die zur Wiederholung, Reflexion und Weiterentwicklung der behandelten Themen dienen, sollen die Leser anregen, kreativ eigene Simulationen zu entwickeln und untersuchen.

Would your company be prepared in the event of: * Computer-driven espionage * A devastating virus attack * A hacker's unauthorized access * A breach of data security? As the sophistication of computer technology has grown, so has therate of computer-related criminal activity. Subsequently, Americancorporations now lose billions of dollars a year to hacking,identity theft, and other computer attacks. More than ever,businesses and professionals responsible for the critical data ofcountless customers and employees need to anticipate and safeguardagainst computer intruders and attacks. The first book to successfully speak to the nontechnicalprofessional in the fields of business and law on the topic ofcomputer crime, Computer Forensics: An Essential Guide forAccountants, Lawyers, and Managers provides valuable advice on thehidden difficulties that can blindside companies and result indamaging costs. Written by industry expert Michael Sheetz, this important bookprovides readers with an honest look at the computer crimes thatcan annoy, interrupt--and devastate--a business. Readers areequipped not only with a solid understanding of how computersfacilitate fraud and financial crime, but also how computers can beused to investigate, prosecute, and prevent these crimes. If you want to know how to protect your company from computercrimes but have a limited technical background, this book is foryou. Get Computer Forensics: An Essential Guide for Accountants,Lawyers, and Managers and get prepared.

The Kuala Lumpur International Conference on Biomedical Engineering (BioMed 2006) was held in December 2006 at the Palace of the Golden Horses, Kuala Lumpur, Malaysia. The papers presented at BioMed 2006, and published here, cover such topics as Artificial Intelligence, Biological effects of non-ionising electromagnetic fields, Biomaterials, Biomechanics, Biomedical Sensors, Biomedical Signal Analysis, Biotechnology, Clinical Engineering, Human performance engineering, Imaging, Medical Informatics, Medical Instruments and Devices, and many more.

Interest in medical expert systems, neural networks and other artificial intelligence techniques is on the increase as more healthcare providers realise their potential, and engineers and scientists are discovering that medicine and healthcare are very fertile areas for developing new, or applying existing, intelligent algorithms to real problems. Intelligent systems make it possible to capture expert medical knowledge and to discover new knowledge so as to improve in-patient monitoring, data analysis and decision making, and hence the quality of healthcare.This book contains features which include: neural networks and expert systems techniques, as well as medical neural networks and expert systems. It should be of interest to managers, academics, engineers, scientists and medical practitioners involved in the funding, development and use of intelligent medical systems.

Soft computing embraces various methodologies for the development of intelligent systems that have been successfully applied to a large number of real-world problems. Soft Computing in Industry contains a collection of papers that were presented at the 6th On-line World Conference on Soft Computing in Industrial Applications that was held in September 2001. It provides a comprehensive overview of recent theoretical developments in soft computing as well as of successful industrial applications. It is divided into seven parts covering material on: keynote papers on various subjects ranging from computing with autopoietic systems to the effects of the Internet on education; intelligent control; classification, clustering and optimization; image and signal processing; agents, multimedia and Internet; theoretical advances; prediction, design and diagnosis. The book is aimed at researchers and professional engineers who develop and apply intelligent systems in computer engineering.

The 2015 collection will include papers from the following symposia: Alumina and Bauxite Aluminum Alloys: Fabrication, Characterization and Applications Aluminum Processing Aluminum Reduction Technology Cast Shop for Aluminum Production Electrode Technology for Aluminum Production Strip Casting of Light Metals

PSpice is a software package that provides robust, advanced circuit analysis tools to improve design performance, yield, and reliability. Its capabilities enable engineers to create virtual prototypes of designs and maximize circuit performance automatically. This book is the fifth of a five-part series of books covering PSpice 10.5 and all of its applications. This book examines linear time invariant systems starting with the difference equation and applying the z-transform to produce a range of filter type i.e. low-pass, high-pass, and bandpass. Convolution is examined, followed by digital oscillators, including quadrature carrier generation, are then examined. Several filter design methods are considered and include the bilinear transform, impulse invariant, and window techniques. A range of DSP applications are then considered and include the Hilbert transform, single sideband modulator using the Hilbert transform and quad oscillators, integrators and differentiators. Decimation and interpolation are simulated to demonstrate the usefulness of the multi-sampling environment. Decimation is also applied in a treatment on digital receivers. Lastly, we look at some musical applications for DSP such as reverberation/echo using real-world signals imported into PSpice using the program Wav2Ascii. The zero-forcing equalizer is dealt with in a simplistic manner and illustrates the effectiveness of equalizing signals in a receiver after transmission.Other books in the series:PSpice for Circuit Theory and Electronic Devices (9781598291568)PSpice for Filters and Transmission Lines (9781598291582)PSpice for Analog Communications Engineering (9781598291605)PSpice for Digital Communications Engineering (9781598291629)

Biological engineering is a field of engineering in which the emphasis is on life and life-sustaining systems. Biological engineering is an emerging discipline that encompasses engineering

theory and practice connected to and derived from the science of biology. The most important trend in biological engineering is the dynamic range of scales at which biotechnology is now able to integrate with biological processes. An explosion in micro/nanoscale technology is allowing the manufacture of nanoparticles for drug delivery into cells, miniaturized implantable microsensors for medical diagnostics, and micro-engineered robots for on-board tissue repairs. This book aims to provide an updated overview of the recent developments in biological engineering from diverse aspects and various applications in clinical and experimental research.

Intended as a text for three courses—Signals and Systems, Digital Signal Processing (DSP), and DSP Architecture—this comprehensive book now in its Third Edition, continues to provide a thorough understanding of digital signal processing, beginning from the fundamentals to the implementation of algorithms on a digital signal processor. This Edition includes Assembly, C and real time C programs for TMS 320C54XX and 320C6713 processor, which are useful to conduct a laboratory course in Digital Signal Processing. Besides, many existing chapters are modified substantially to widen the coverage of the book. Primarily designed for undergraduate students of Electronics and Communication Engineering, Electronics and Instrumentation Engineering, Electrical and Electronics Engineering, Instrumentation and Control Engineering, Computer Science and Information Science, this text will also be useful for advanced digital signal processing and real time digital signal processing courses of postgraduate programmes.

Neuübersetzung der aktuelle US-Ausgabe.

Behavioral Synthesis: A Practical Guide to High-Level Design includes details on new material and new interpretations of old material with an emphasis on practical information. The intended audience is the ASIC (or high-end FPGA) designer who will be using behavioral synthesis, the manager who will be working with those designers, or the engineering student who is studying leading-edge design techniques. Today's designs are creating tremendous pressures for digital designers. Not only must they compress more functionality onto a single IC, but this has to be done on shorter schedules to stay ahead in extremely competitive markets. To meet these opposing demands, designers must work at a new, higher level of abstraction to efficiently make the kind of architectural decisions that are critical to the success of today's complex designs. In other words, they must include behavioral design in their flow. The biggest challenge to adopting behavioral design is changing the mindset of the designer. Instead of describing system functionality in great detail, the designer outlines the design in broader, more abstract terms. The ability to easily and efficiently consider multiple design alternatives over a wide range of cost and performance is an extremely persuasive reason to make this leap to a high level of abstraction. Designers that learn to think and work at the behavioral level will reap major benefits in the resultant quality of the final design. But such changes in methodology are difficult to achieve rapidly. Education is essential to making this transition. Many designers will recall the difficulty transitioning from schematic-based design to RTL design. Designers that were new to the technology often felt that they had not been told enough about how synthesis worked and that they were not taught how to effectively write HDL code that would synthesize efficiently. Using this unique book, a designer will understand what behavioral synthesis tools are doing (and why) and how to effectively describe their designs that they are appropriately synthesized. CD ROM INCLUDED! The accompanying CD-ROM contains the source code and test benches for the three case studies discussed in Chapters 14, 15 and 16.

This book presents a review of the latest advances in speech and video compression, computer networking protocols, the assessment and monitoring of VoIP quality, and next generation network architectures for multimedia services. The book also concludes with three case studies, each presenting easy-to-follow step-by-step instructions together with challenging hands-on exercises. Features: provides illustrative worked examples and end-of-chapter problems; examines speech and video compression techniques, together with speech and video compression standards; describes the media transport protocols RTP and RTCP, as well as the VoIP signalling protocols SIP and SDP; discusses the concepts of VoIP quality of service and quality of experience; reviews next-generation networks based on the IP multimedia subsystem and mobile VoIP; presents case studies on building a VoIP system based on Asterisk, setting up a mobile VoIP system based on Open IMS and Android mobile, and analysing VoIP protocols and quality.

In this new era of computing, where the iPhone, iPad, Xbox Kinect, and similar devices have changed the way to interact with computers, many questions have risen about how modern input devices can be used for a more intuitive user interaction. Interaction Design for 3D User Interfaces: The World of Modern Input Devices for Research, Applications, a

This volume covers the topics of: instrument design and measurement theory, reliability of instruments and fault diagnosis, precision instruments and computer vision, automation instruments, electrical and electronic instruments and equipment, sensors and their application, control technologies and applications, fluid power transmission and control, mechatronics, modeling, analysis and simulation, artificial intelligence, industrial robots and automation, automotive control systems, intelligent traffic control, CAD/CAM/CAE/CIM, optoelectronic technology, embedded systems, communication technology and network security, software development and mathematical modeling, computer applications in industry and engineering, the internet.

Wer die Methoden der digitalen Signalverarbeitung erlernen oder anwenden will, kommt ohne das weltweit bekannte, neu gefaßte Standardwerk "Oppenheim/Schafer" nicht aus. Die Beliebtheit des Buches beruht auf den didaktisch hervorragenden Einführungen, der umfassenden und tiefgreifenden Darstellung der Grundlagen, der kompetenten Berücksichtigung moderner Weiterentwicklungen und der Vielzahl verständnisfördernder Aufgaben.

Die Spektrale Analyse von Signalen ist ein wichtiger Bestandteil der Signalverarbeitung. MATLAB und Simulink sind ideale Instrumente zur computergestützten Spektralanalyse. Zu den verschiedensten Signalen werden hier Herangehensweisen zur Analyse beschrieben und jeweils durch einige Experimente veranschaulicht. Die Beispiele stammen aus Kommunikationstechnik, Elektrotechnik und Mechanischer Schwingungstechnik.

Digital power system protection, as a subject, offers the use of computers in power line relaying which is the act of automatically controlling the power system via instrumentation and control devices. This book is an attempt to make a gentle introduction to the nitty-gritty of digital relays. Written in a simple, clear and student-friendly style, this text covers basics of digital processing of analog signals for the purpose of relaying. All important basic algorithms that are used in various types of digital relays have been explained. FIR and IIR filters have been presented in such a manner that students will be able to develop intuitive understanding. The book also covers DFT and FFT and synchrophasor technology in details. MATLAB programs and Excel simulations have been given to reinforce the comprehension of the algorithms. This book has been thoroughly class-room

tested and based on course notes which is primarily intended for undergraduate and postgraduate students of electrical engineering. Key Features • In-depth coverage of DSP fundamentals • Pedagogical tools like figures, flowcharts, block diagrams and tables have been extensively used • Review questions are given at the end of each chapter • Extensive references to literature on power system protection

Advances in Computer and Information Sciences and Engineering includes a set of rigorously reviewed world-class manuscripts addressing and detailing state-of-the-art research projects in the areas of Computer Science, Software Engineering, Computer Engineering, and Systems Engineering and Sciences. Advances in Computer and Information Sciences and Engineering includes selected papers from the conference proceedings of the International Conference on Systems, Computing Sciences and Software Engineering (SCSS 2007) which was part of the International Joint Conferences on Computer, Information and Systems Sciences and Engineering (CISSE 2007).

The three volume set LNCS 3610, LNCS 3611, and LNCS 3612 constitutes the refereed proceedings of the First International Conference on Natural Computation, ICNC 2005, held in Changsha, China, in August 2005 as a joint event with the Second International Conference on Fuzzy Systems and Knowledge Discovery FSKD 2005 (LNAI volumes 3613 and 3614). The program committee selected 313 carefully revised full papers and 189 short papers for presentation in three volumes from 1887 submissions. The first volume includes all the contributions related to learning algorithms and architectures in neural networks, neurodynamics, statistical neural network models and support vector machines, and other topics in neural network models; cognitive science, neuroscience informatics, bioinformatics, and bio-medical engineering, and neural network applications such as communications and computer networks, expert system and informatics, and financial engineering. The second volume concentrates on neural network applications as pattern recognition and diagnostics, robotics and intelligent control, signal processing and multi-media, and other neural network applications; evolutionary learning, artificial immune systems, evolutionary theory, membrane, molecular, DNA computing, and ant colony systems. The third volume deals with evolutionary methodology, quantum computing, swarm intelligence and intelligent agents; natural computation applications as bioinformatics and bio-medical engineering, robotics and intelligent control, and other applications of natural computation; hardware implementations of natural computation, and fuzzy neural systems as well as soft computing.

Digital Signal ProcessingA Practical ApproachPearson Education

Das Lehrbuch präsentiert ausführlich und durch viele Beispiele veranschaulicht den Einsatz von MATLAB und Simulink zur Darstellung und Berechnung in der Signalverarbeitung. Einen besonderen Schwerpunkt stellt dabei das Kernthema Filterung dar. Komprimiert werden auch die notwendigen Grundlagen für die allgemeine Arbeit mit der Software MATLAB und Simulink geboten. Die anwendungsorientierten Experimente, die beschrieben werden und immer auch grafisch dargestellt sind, behandeln die Analyse und Synthese analoger Filter, die Entwicklung digitaler Filter mit Hilfe klassischer als auch spezieller Entwicklungsverfahren, die Multiraten-Signalverarbeitung mit Polyphasenfiltern, Multiratenfilterbänken, CIC und IFIR-Filtern und zuletzt den Einsatz adaptiver Filter. Dabei wird die Verwendung der Werkzeuge der MATLAB-Toolboxen Schritt für Schritt erklärt, Programmcodes werden wiedergegeben und auch der mathematische Hintergrund der Berechnungen wird beleuchtet.

The professional recording industry is rapidly moving from a hardware paradigm (big studios with expensive gear) to a software paradigm, in which lots of expensive hardware is replaced with a single computer loaded with software plug-ins. Complete albums are now being recorded and engineered "inside the box"-all within a computer without hardware processing or mixing gear. Audio effect plug-ins, which are small software modules that work within audio host applications, like Avid Pro Tools, Apple Logic, Ableton Live, and Steinberg Cubase, are big business. Designing Audio Effect Plug-Ins in C++ gives readers everything they need to know to create real-world, working plug-ins in the widely used C++ programming language. Beginning with the necessary theory behind audio signal processing, author Will Pirkle quickly gets into the heart of this implementation guide, with clearly-presented, previously unpublished algorithms, tons of example code, and practical advice. From the companion website, readers can download free software for the rapid development of the algorithms, many of which have never been revealed to the general public. The resulting plug-ins can be compiled to snap in to any of the above host applications. Readers will come away with the knowledge and tools to design and implement their own audio signal processing designs. Learn to build audio effect plug-ins in a widely used, implementable programming language-C++ Design plug-ins for a variety of platforms (Windows and Mac) and popular audio applications Companion site gives you fully worked-out code for all the examples used, free development software for download, video tutorials for the software, and examples of student plug-ins complete with theory and code

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