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Global Positioning Systems, Inertial Navigation, and Integration - Mohinder S. Grewal 2007-03-05

An updated guide to GNSS and INS, and solutions to real-world GPS/INS problems with Kalman filtering. Written by recognized authorities in the field, this second edition of a landmark work provides engineers, computer scientists, and others with a working familiarity with the theory and contemporary applications of Global Navigation Satellite Systems (GNSS), Inertial Navigational Systems (INS), and Kalman filters. Throughout, the focus is on solving real-world problems, with an emphasis on the effective use of state-of-the-art integration techniques for those systems, especially the application of Kalman filtering. To that end, the authors explore the various subtleties, common failures, and inherent limitations of the theory as it applies to real-world situations, and provide numerous detailed application examples and practice problems, including GNSS-aided INS, modeling of gyros and accelerometers, and SBAS and GBAS. Drawing upon their many years of experience with GNSS, INS, and the Kalman filter, the authors present numerous design and implementation techniques not found in other professional references. This Second Edition has been updated to include: GNSS signal integrity with SBAS Mitigation of multipath, including results Ionospheric delay estimation with Kalman filters New MATLAB programs for satellite position determination using almanac and ephemeris data and ionospheric delay calculations from single and dual frequency data New algorithms for GEO with L1 /L5 frequencies and clock steering Implementation of mechanization equations in numerically stable algorithms To enhance comprehension of the subjects covered, the authors have included software in MATLAB, demonstrating the working of the GNSS, INS, and filter algorithms. In addition to showing the Kalman filter in action, the software also demonstrates various practical aspects of finite word length arithmetic and the need for alternative algorithms to preserve result accuracy.

Art at the Turn of the Millennium - Riemschneider 1999

Pro C# 2010 and the .NET 4 Platform - Andrew Troelsen 2010-07-07

The first edition of this book was released at the 2001 Tech-Ed conference in Atlanta, Georgia. At that time, the .NET platform was still a beta product, and in many ways, so was this book. This is not to say that the early editions of this text did not have merit—after all, the book was a 2002 Jolt Award finalist and it won the 2003 Referenceware Excellence Award. However, over the years that author Andrew Troelsen spent working with the common language runtime (CLR), he gained a much deeper understanding of the .NET platform and the subtleties of the C# programming language, and he feels that this fifth edition of the book is as close to a “final release” as he’s come yet. This new edition has been comprehensively revised and rewritten to make it accurately reflect the C# 4 language specification for the .NET 4 platform. You’ll find new chapters covering the important concepts of dynamic lookups, named and optional arguments, Parallel LINQ (PLINQ), improved COM interop, and variance for generics. If you’re checking out this book for the first time, do understand that it’s targeted at experienced software professionals and/or graduate students of computer science (so don’t expect three chapters on iteration or decision constructs!). The mission of this text is to provide you with a rock-solid foundation in the C# programming language and the core aspects of the .NET platform (assemblies, remoting, Windows Forms, Web Forms, ADO.NET, XML web services, etc.). Once you digest the information presented in these 25 chapters, you’ll be in a perfect position to apply this knowledge to your specific programming assignments, and you’ll be well equipped to explore the .NET universe on your own terms.

Programming and Use of TMS320F2812 DSP to Control and Regulate Power Electronic Converters - Baris Bagci 2003

Research to study, operate, and program the 32-bit 150MIPS TMS320F2812 digital signal processor (DSP) developed by Texas Instruments, Inc. In addition, it is an examination of the implementation of fast estimation techniques for control of resonant converters. For this purpose, pulse-width modulation (PWM) signals that are generated using this DSP are used.

Programming Embedded Systems in C and C++ - Michael Barr 1999

This book introduces embedded systems to C and C++ programmers. Topics include testing memory devices, writing and erasing flash memory, verifying nonvolatile memory contents, controlling on-chip peripherals, device driver design and implementation, and more.

VLSI Synthesis of DSP Kernels - Mahesh Mehendale 2013-04-17

A critical step in the design of a DSP system is to identify for each of its components an implementation architecture that provides the desired degree of flexibility/programmability and optimises the area-delay-power parameters. This essential book covers architectures that offer varying degrees of programmability.

Multi-Carrier Spread-Spectrum - Khaled Fazel 2006-08-12

Aims to edit the ensemble of the contributions and research results in this field that have been presented during the 5th International Workshop on Multi-Carrier Spread-Spectrum (MC-SS 2005), held in Oberpfaffenhofen, Germany.

Applied Intelligent Control of Induction Motor Drives - Tze Fun Chan 2011-01-19

Induction motors are the most important workhorses in industry. They are mostly used as constant-speed drives when fed from a voltage source of fixed frequency. Advent of advanced power electronic converters and powerful digital signal processors, however, has made possible the development of high performance, adjustable speed AC motor drives. This book aims to explore new areas of induction motor control based on artificial intelligence (AI) techniques in order to make the controller less sensitive to parameter changes.

Selected AI techniques are applied for different induction motor control strategies. The book presents a practical computer simulation model of the induction motor that could be used for studying various induction motor drive operations. The control strategies explored include expert-system-based acceleration control, hybrid-fuzzy/PI two-stage control, neural-network-based direct self control, and genetic algorithm based extended Kalman filter for rotor speed estimation. There are also chapters on neural-network-based parameter estimation, genetic-algorithm-based optimized random PWM strategy, and experimental investigations. A chapter is provided as a primer for readers to get started with simulation studies on various AI techniques. Presents major artificial intelligence techniques to induction motor drives Uses a practical simulation approach to get interested readers started on drive development Authored by experienced scientists with over 20 years of experience in the field Provides numerous examples and the latest research results Simulation programs available from the book's Companion Website This book will be invaluable to graduate students and research engineers who specialize in electric motor drives, electric vehicles, and electric ship propulsion. Graduate students in intelligent control, applied electric motion, and energy, as well

as engineers in industrial electronics, automation, and electrical transportation, will also find this book helpful.

Simulation materials available for download at www.wiley.com/go/chanmotor

Digital Signal Processing and Applications with the C6713 and C6416 DSK - Rulph Chassaing 2004-12-20

This book is a tutorial on digital techniques for waveform generation, digital filters, and digital signal processing tools and techniques The typical chapter begins with some theoretical material followed by working examples and experiments using the TMS320C6713-based DSPStarter Kit (DSK) The C6713 DSK is TI's newest signal processor based on the C6x processor (replacing the C6711 DSK)

C: A Reference Manual - Harbison 2007-09

For C Programming Courses Found In Departments Of Computer Science, Engineering, Cis, Mis, It, Business And Continuing Education. This Authoritative Reference Manual Provides A Complete Description Of The C Language, The Run-Time Libraries, And A Style Of C Programming That Emphasizes Correctness, Portability, And Maintainability. The Authors Describe The C Language More Clearly And In More Detail Than In Any Other Book.

Analog Interfacing to Embedded Microprocessor Systems - Stuart Ball 2004

System Design; Digital to Analog Converters; Sensors; Time-Based Measurements; Output Control Methods; Solenoids, Relays, and Other Analog Outputs; Motors; EMI; High Precision Applications; Standard Interfaces. EDN - 2006

Real-Time Digital Signal Processing - Sen M. Kuo 2006-05-01

Real-time Digital Signal Processing: Implementations and Applications has been completely updated and revised for the 2nd edition and remains the only book on DSP to provide an overview of DSP theory and programming with hands-on experiments using MATLAB, C and the newest fixed-point processors from Texas Instruments (TI).

MSP430 Microcontroller Basics - John H. Davies 2008-08-21

The MSP430 microcontroller family offers ultra-low power mixed signal, 16-bit architecture that is perfect for wireless low-power industrial and portable medical applications. This book begins with an overview of embedded systems and microcontrollers followed by a comprehensive in-depth look at the MSP430. The coverage included a tour of the microcontroller's architecture and functionality along with a review of the development environment. Start using the MSP430 armed with a complete understanding of the microcontroller and what you need to get the microcontroller up and running! Details C and assembly language for the MSP430 Companion Web site contains a development kit Full coverage is given to the

MSP430 instruction set, and sigma-delta analog-digital converters and timers

ARM System Developer's Guide - Andrew Sloss 2004-05-10

Over the last ten years, the ARM architecture has become one of the most pervasive architectures in the world, with more than 2 billion ARM-based processors embedded in products ranging from cell phones to automotive braking systems. A world-wide community of ARM developers in semiconductor and product design companies includes software developers, system designers and hardware engineers. To date no book has directly addressed their need to develop the system and software for an ARM-based system. This text fills that gap. This book provides a comprehensive description of the operation of the ARM core from a developer's perspective with a clear emphasis on software. It demonstrates not only how to write efficient ARM software in C and assembly but also how to optimize code. Example code throughout the book can be integrated into commercial products or used as templates to enable quick creation of productive software. The book covers both the ARM and Thumb instruction sets, covers Intel's XScale Processors, outlines distinctions among the versions of the ARM architecture, demonstrates how to implement DSP algorithms, explains exception and interrupt handling, describes the cache technologies that surround the ARM cores as well as the most efficient memory management techniques. A final chapter looks forward to the future of the ARM architecture considering ARMv6, the latest change to the instruction set, which has been designed to improve the DSP and media processing capabilities of the architecture. * No other book describes the ARM core from a system and software perspective. * Author team combines extensive ARM software engineering experience with an in-depth knowledge of ARM developer needs. * Practical, executable code is fully explained in the book and available on the publisher's Website. * Includes a simple embedded operating system.

Offshore Wind Energy Generation - Olimpo Anaya-Lara 2014-03-26

The offshore wind sector's trend towards larger turbines, bigger wind farm projects and greater distance to shore has a critical impact on grid connection requirements for offshore wind power plants. This important reference sets out the fundamentals and latest innovations in electrical systems and control strategies deployed in offshore electricity grids for wind power integration. Includes: All current and emerging technologies for offshore wind integration and trends in energy storage systems, fault limiters, superconducting cables and gas-insulated transformers Protection of offshore wind farms illustrating numerous system integration and protection challenges through case studies Modelling of doubly-fed induction generators (DFIG) and full-converter wind turbines structures together with an explanation of the smart grid concept in the context of wind farms Comprehensive material on power electronic equipment employed in wind turbines with emphasis on enabling technologies (HVDC, STATCOM) to facilitate the connection and

compensation of large-scale onshore and offshore wind farms Worked examples and case studies to help understand the dynamic interaction between HVDC links and offshore wind generation Concise description of the voltage source converter topologies, control and operation for offshore wind farm applications Companion website containing simulation models of the cases discussed throughout Equipping electrical engineers for the engineering challenges in utility-scale offshore wind farms, this is an essential resource for power system and connection code designers and practitioners dealing with integration of wind generation and the modelling and control of wind turbines. It will also provide high-level support to academic researchers and advanced students in power and renewable energy as well as technical and research staff in transmission and distribution system operators and in wind turbine and electrical equipment manufacturers.

Control of Power Inverters in Renewable Energy and Smart Grid Integration - Qing-Chang Zhong 2012-11-16

Integrating renewable energy and other distributed energysources into smart grids, often via power inverters, is arguablythe largest "new frontier" for smart grid advancements.Inverters should be controlled properly so that their integrationdoes not jeopardize the stability and performance of power systemsand a solid technical backbone is formed to facilitate otherfunctions and services of smart grids. This unique reference offers systematic treatment of importantcontrol problems in power inverters, and different generalconverter theories. Starting at a basic level, it presentsconventional power conversion methodologies and then'non-conventional' methods, with a highly accessiblesummary of the latest developments in power inverters as well asinsight into the grid connection of renewable power. Consisting of four parts – Power Quality Control, NeutralLine Provision, Power Flow Control, and Synchronisation –this book fully demonstrates the integration of control and powerelectronics. Key features include: the fundamentals of power processing and hardware design innovative control strategies to systematically treat thecontrol of power inverters extensive experimental results for most of the controlstrategies presented the pioneering work on "synchronverters" which hasgained IET Highly Commended Innovation Award Engineers working on inverter design and those at power systemutilities can learn how advanced control strategies could improvesystem performance and work in practice. The book is a usefulreference for researchers who are interested in the area of controlengineering, power electronics, renewable energy and distributedgeneration, smart grids, flexible AC transmission systems, andpower systems for more-electric aircraft and all-electric ships.This is also a handy text for graduate students and universityprofessors in the areas of electrical power engineering, advancedcontrol engineering, power electronics, renewable energy and smartgrid integration.

DSP for Embedded and Real-Time Systems - Robert Oshana 2012-07-12

This book includes a range of techniques for developing digital signal processing code; tips and tricks for

optimizing DSP software; and various options available for constructing DSP systems from numerous software components.

Control of Power Electronic Converters and Systems - Frede Blaabjerg 2018-04-27

Control of Power Electronic Converters, Volume Two gives the theory behind power electronic converter control and discusses the operation, modelling and control of basic converters. The main components of power electronics systems that produce a desired effect (energy conversion, robot motion, etc.) by controlling system variables (voltages and currents) are thoroughly covered. Both small (mobile phones, computer power supplies) and very large systems (trains, wind turbines, high voltage power lines) and their power ranges, from the Watt to the Gigawatt, are presented and explored. Users will find a focused resource on how to apply innovative control techniques for power converters and drives. Discusses different applications and their control Explains the most important controller design methods, both in analog and digital Describes different, but important, applications that can be used in future industrial products Covers voltage source converters in significant detail Demonstrates applications across a much broader context

Real-time Digital Signal Processing - Sen-Maw Kuo 2003

Digital Signal Processing and Applications with the TMS320C6713 and TMS320C6416 DSK - Rulph Chassaing 2011-09-20

Digital Signal Processing and Applications with the TMS320C6713 and TMS320C6416 DSK Now in a new edition—the most comprehensive, hands-on introduction to digital signal processing The first edition of Digital Signal Processing and Applications with the TMS320C6713 and TMS320C6416 DSK is widely accepted as the most extensive text available on the hands-on teaching of Digital Signal Processing (DSP). Now, it has been fully updated in this valuable Second Edition to be compatible with the latest version (3.1) of Texas Instruments Code Composer Studio (CCS) development environment. Maintaining the original's comprehensive, hands-on approach that has made it an instructor's favorite, this new edition also features: Added program examples that illustrate DSP concepts in real-time and in the laboratory Expanded coverage of analog input and output New material on frame-based processing A revised chapter on IIR, which includes a number of floating-point example programs that explore IIR filters more comprehensively More extensive coverage of DSP/BIOS All programs listed in the text—plus additional applications—which are available on a companion website No other book provides such an extensive or comprehensive set of program examples to aid instructors in teaching DSP in a laboratory using audio frequency signals—making this an ideal text for DSP courses at the senior undergraduate and postgraduate levels. It also serves as a valuable resource for

researchers, DSP developers, business managers, and technology solution providers who are looking for an overview and examples of DSP algorithms implemented using the TMS320C6713 and TMS320C6416 DSK.

The Practical Vibration Primer - Charles Jackson 2012-04-16

Embedded Systems - Jonathan W. Valvano 2012-01-01

Embedded systems are a ubiquitous component of our everyday lives. We interact with hundreds of tiny computers every day that are embedded into our houses, our cars, our toys, and our work. As our world has become more complex, so have the capabilities of the microcontrollers embedded into our devices. The ARM® Cortex™-M3 is represents the new class of microcontroller much more powerful than the devices available ten years ago. The purpose of this book is to present the design methodology to train young engineers to understand the basic building blocks that comprise devices like a cell phone, an MP3 player, a pacemaker, antilock brakes, and an engine controller. This book is the third in a series of three books that teach the fundamentals of embedded systems as applied to the ARM® Cortex™-M3. This third volume is primarily written for senior undergraduate or first-year graduate electrical and computer engineering students. It could also be used for professionals wishing to design or deploy a real-time operating system onto an Arm platform. The first book Embedded Systems: Introduction to the ARM Cortex-M3 is an introduction to computers and interfacing focusing on assembly language and C programming. The second book Embedded Systems: Real-Time Interfacing to the ARM Cortex-M3 focuses on interfacing and the design of embedded systems. This third book is an advanced book focusing on operating systems, high-speed interfacing, control systems, and robotics. Rather than buying and deploying an existing OS, the focus is on fundamental principles, so readers can write their-own OS. An embedded system is a system that performs a specific task and has a computer embedded inside. A system is comprised of components and interfaces connected together for a common purpose. Specific topics include microcontrollers, design, verification, hardware/software synchronization, interfacing devices to the computer, real-time operating systems, data collection and processing, motor control, analog filters, digital filters, and real-time signal processing. This book employs many approaches to learning. It will not include an exhaustive recapitulation of the information in data sheets. First, it begins with basic fundamentals, which allows the reader to solve new problems with new technology. Second, the book presents many detailed design examples. These examples illustrate the process of design. There are multiple structural components that assist learning. Checkpoints, with answers in the back, are short easy to answer questions providing immediate feedback while reading. Simple homework, with answers to the odd questions on the web, provides more detailed learning opportunities. The book

includes an index and a glossary so that information can be searched. The most important learning experiences in a class like this are of course the laboratories. Each chapter has suggested lab assignments. More detailed lab descriptions are available on the web. Specifically for Volume 1, look at the lab assignments for EE319K. For Volume 2 refer to the EE445L labs, and for this volume, look at the lab assignments for EE345M/EE380L.6. There is a web site accompanying this book <http://users.ece.utexas.edu/~valvano/arm>. Posted here are Keil uVision projects for each the example programs in the book. You will also find data sheets and Excel spreadsheets relevant to the material in this book. The book will cover embedded systems for the ARM® Cortex™-M3 with specific details on the LM3S811, LM3S1968, and LM3S8962. Most of the topics can be run on the simple LM3S811. DMA interfacing will be presented on the LM3S3748. Ethernet and CAN examples can be run on the LM3S8962. In this book the term LM3Sxxx family will refer to any of the Texas Instruments Stellaris® ARM® Cortex™-M3-based microcontrollers. Although the solutions are specific for the LM3Sxxx family, it will be possible to use this book for other Arm derivatives.

Grid Converters for Photovoltaic and Wind Power Systems - Remus Teodorescu 2011-07-28

Grid converters are the key player in renewable energy integration. The high penetration of renewable energy systems is calling for new more stringent grid requirements. As a consequence, the grid converters should be able to exhibit advanced functions like: dynamic control of active and reactive power, operation within a wide range of voltage and frequency, voltage ride-through capability, reactive current injection during faults, grid services support. This book explains the topologies, modulation and control of grid converters for both photovoltaic and wind power applications. In addition to power electronics, this book focuses on the specific applications in photovoltaic wind power systems where grid condition is an essential factor. With a review of the most recent grid requirements for photovoltaic and wind power systems, the book discusses these other relevant issues: modern grid inverter topologies for photovoltaic and wind turbines islanding detection methods for photovoltaic systems synchronization techniques based on second order generalized integrators (SOGI) advanced synchronization techniques with robust operation under grid unbalance condition grid filter design and active damping techniques power control under grid fault conditions, considering both positive and negative sequences Grid Converters for Photovoltaic and Wind Power Systems is intended as a coursebook for graduated students with a background in electrical engineering and also for professionals in the evolving renewable energy industry. For people from academia interested in adopting the course, a set of slides is available for download from the website. www.wiley.com/go/grid_converters

Offshore Wind Energy Technology - Olimpo Anaya-Lara 2018-05-11

A COMPREHENSIVE REFERENCE TO THE MOST RECENT ADVANCEMENTS IN OFFSHORE WIND

TECHNOLOGY Offshore Wind Energy Technology offers a reference based on the research material developed by the acclaimed Norwegian Research Centre for Offshore Wind Technology (NOWITECH) and material developed by the expert authors over the last 20 years. This comprehensive text covers critical topics such as wind energy conversion systems technology, control systems, grid connection and system integration, and novel structures including bottom-fixed and floating. The text also reviews the most current operation and maintenance strategies as well as technologies and design tools for novel offshore wind energy concepts. The text contains a wealth of mathematical derivations, tables, graphs, worked examples, and illustrative case studies. Authoritative and accessible, Offshore Wind Energy Technology: Contains coverage of electricity markets for offshore wind energy and then discusses the challenges posed by the cost and limited opportunities Discusses novel offshore wind turbine structures and floaters Features an analysis of the stochastic dynamics of offshore/marine structures Describes the logistics of planning, designing, building, and connecting an offshore wind farm Written for students and professionals in the field, Offshore Wind Energy Technology is a definitive resource that reviews all facets of offshore wind energy technology and grid connection.

Getting Started with the MSP430 Launchpad - Adrian Fernandez 2013-04-19

This book explores the world of microcontroller development through friendly lessons and progressively challenging projects, which will have you blink LEDs, make music with buzzers & interact with different sensors like accelerometers and temperature sensors. This book is focused on the MSP-EXP430G2 LaunchPad Evaluation Kit, which is a complete microcontroller development platform that includes everything you need to start creating microcontroller-based projects. Many of the 25+ projects will also leverage external components, such as the highly-integrated Educational BoosterPack, which is a modular extension to the LaunchPad and includes many components such as an RGB LED, character LCD & potentiometer. This book provides helpful guides that break down hardware circuits through visual diagrams and includes fully-commented code examples. Concepts are broken down and explained in an easy to follow language and analogies to help you understand the principles behind each project/system. The projects will encourage you to use and even combine the fundamental concepts to develop your ideas in creating new microcontroller solutions. Coverage includes: Digital Input/Output: buttons, LEDs, turning anything into a button Analog Input/Output: sensors, temperature, accelerometer, potentiometer, etc. Programming fundamentals: conditional branches & loops, flow, logic, number systems Pulse-Width Modulation (PWM): square wave, buzzer, analog signal simulation Serial Communication: UART, SPI & I2C Code development using Energia, a free, open-source code editor and compiler Debugging through serial communication with a computer Interfacing with

external components such as LEDs, buzzers, potentiometers, sensors & more. With the help of this book, you will be challenged to think about developing your own unique microcontroller-based application, and you will be equipped to start solving various problems, adding intelligence to existing products, or even developing your own innovative creations with a LaunchPad development kit. Includes over 25 projects which focuses on a learn by doing approach Contains easy to follow diagrams and code examples Covers Programming fundamentals, such as conditional branches and loops, flow, logic, number systems

Magnetic Resonance Imaging - Robert W. Brown 2014-06-23

New edition explores contemporary MRI principles and practices Thoroughly revised, updated and expanded, the second edition of *Magnetic Resonance Imaging: Physical Principles and Sequence Design* remains the preeminent text in its field. Using consistent nomenclature and mathematical notations throughout all the chapters, this new edition carefully explains the physical principles of magnetic resonance imaging design and implementation. In addition, detailed figures and MR images enable readers to better grasp core concepts, methods, and applications. *Magnetic Resonance Imaging, Second Edition* begins with an introduction to fundamental principles, with coverage of magnetization, relaxation, quantum mechanics, signal detection and acquisition, Fourier imaging, image reconstruction, contrast, signal, and noise. The second part of the text explores MRI methods and applications, including fast imaging, water-fat separation, steady state gradient echo imaging, echo planar imaging, diffusion-weighted imaging, and induced magnetism. Lastly, the text discusses important hardware issues and parallel imaging. Readers familiar with the first edition will find much new material, including: New chapter dedicated to parallel imaging New sections examining off-resonance excitation principles, contrast optimization in fast steady-state incoherent imaging, and efficient lower-dimension analogues for discrete Fourier transforms in echo planar imaging applications Enhanced sections pertaining to Fourier transforms, filter effects on image resolution, and Bloch equation solutions when both rf pulse and slice select gradient fields are present Valuable improvements throughout with respect to equations, formulas, and text New and updated problems to test further the readers' grasp of core concepts Three appendices at the end of the text offer review material for basic electromagnetism and statistics as well as a list of acquisition parameters for the images in the book. Acclaimed by both students and instructors, the second edition of *Magnetic Resonance Imaging* offers the most comprehensive and approachable introduction to the physics and the applications of magnetic resonance imaging.

Real Time Systems - Liu 2004

CAN System Engineering - Wolfhard Lawrenz 2013-12-05

This book addresses the various challenges and open questions relating to CAN communication networks. Opening with a short introduction into the fundamentals of CAN, the book then examines the problems and solutions for the physical layout of networks, including EMC issues and topology layout. Additionally, a discussion of quality issues with a particular focus on test techniques is presented. Each chapter features a collection of illuminating insights and detailed technical information supplied by a selection of internationally-regarded experts from industry and academia. Features: presents thorough coverage of architectures, implementations and application of CAN transceiver, data link layer and so-called higher layer software; explains CAN EMC characteristics and countermeasures, as well as how to design CAN networks; demonstrates how to practically apply and test CAN systems; includes examples of real networks from diverse applications in automotive engineering, avionics, and home heating technology.

The Compact Disc Handbook - Ken C. Pohlmann 1992

This revised edition of Ken Pohlmann's classic survey of the compact disc world celebrates the 10th birthday of the most successful consumer electronics product ever produced. New material updates the user on the latest technological advances and gives insight into new formats and applications.

Permanent Magnet Motor Technology - Jacek F. Gieras 2009-08-25

The importance of permanent magnet (PM) motor technology and its impact on electromechanical drives has grown exponentially since the publication of the bestselling second edition. The PM brushless motor market has grown considerably faster than the overall motion control market. This rapid growth makes it essential for electrical and electromechanical engineers and students to stay up-to-date on developments in modern electrical motors and drives, including their control, simulation, and CAD. Reflecting innovations in the development of PM motors for electromechanical drives, *Permanent Magnet Motor Technology: Design and Applications, Third Edition* demonstrates the construction of PM motor drives and supplies ready-to-implement solutions to common roadblocks along the way. This edition supplies fundamental equations and calculations for determining and evaluating system performance, efficiency, reliability, and cost. It explores modern computer-aided design of PM motors, including the finite element approach, and explains how to select PM motors to meet the specific requirements of electrical drives. The numerous examples, models, and diagrams provided in each chapter facilitate a lucid understanding of motor operations and characteristics. This 3rd edition of a bestselling reference has been thoroughly revised to include: Chapters on high speed motors and micromotors Advances in permanent magnet motor technology Additional numerical examples and illustrations An increased effort to bridge the gap between theory and industrial applications Modified research results The growing global trend toward energy conservation makes it quite possible that the era of the PM brushless

motor drive is just around the corner. This reference book will give engineers, researchers, and graduate-level students the comprehensive understanding required to develop the breakthroughs that will push this exciting technology to the forefront.

Innovation in Information Systems and Technologies to Support Learning Research - Mohammed Serrhini
2019-11-30

This book provides glimpses into contemporary research in information systems & technology, learning, artificial intelligence (AI), machine learning, and security and how it applies to the real world, but the ideas presented also span the domains of telehealth, computer vision, the role and use of mobile devices, brain-computer interfaces, virtual reality, language and image processing and big data analytics and applications. Great research arises from asking pertinent research questions. This book reveals some of the authors' "beautiful questions" and how they develop the subsequent "what if" and "how" questions, offering readers food for thought and whetting their appetite for further research by the same authors.

Introduction to Microcontroller Programming for Power Electronics Control Applications - Mattia Rossi
2021-09-29

Microcontroller programming is not a trivial task. Indeed, it is necessary to set correctly the required peripherals by using programming languages like C/C++ or directly machine code. Nevertheless, MathWorks® developed a model-based workflow linked with an automatic code generation tool able to translate Simulink® schemes into executable files. This represents a rapid prototyping procedure, and it can be applied to many microcontroller boards available on the market. Among them, this introductory book focuses on the C2000 LaunchPad™ family from Texas Instruments™ to provide the reader basic programming strategies, implementation guidelines and hardware considerations for some power electronics-based control applications. Starting from simple examples such as turning on/off on-board LEDs, Analog-to-Digital conversion, waveform generation, or how a Pulse-Width-Modulation peripheral should be managed, the reader is guided through the settings of the specific MCU-related Simulink® blocks enabled for code translation. Then, the book proposes several control problems in terms of power management of RL and RLC loads (e.g., involving DC-DC converters) and closed-loop control of DC motors. The control schemes are investigated as well as the working principles of power converter topologies needed to drive the systems under investigation. Finally, a couple of exercises are proposed to check the reader's understanding while presenting a processor-in-the loop (PIL) technique to either emulate the dynamics of complex systems or testing computational performance. Thus, this book is oriented to graduate students of electrical and automation and control engineering pursuing a curriculum in power electronics and drives, as well as to

engineers and researchers who want to deepen their knowledge and acquire new competences in the design and implementations of control schemes aimed to the aforementioned application fields. Indeed, it is assumed that the reader is well acquainted with fundamentals of electrical machines and power electronics, as well as with continuous-time modeling strategies and linear control techniques. In addition, familiarity with sampled-data, discrete-time system analysis and embedded design topics is a plus. However, even if these competences are helpful, they are not essential, since this book provides some basic knowledge even to whom is approaching these topics for the first time. Key concepts are developed from scratch, including a brief review of control theory and modeling strategies for power electronic-based systems.

Integrated Power Electronic Converters and Digital Control - Ali Emadi 2017-12-19

Because of the demand for higher efficiencies, smaller output ripple, and smaller converter size for modern power electronic systems, integrated power electronic converters could soon replace conventional switched-mode power supplies. Synthesized integrated converters and related digital control techniques address problems related to cost, space, flexibility, energy efficiency, and voltage regulation—the key factors in digital power management and implementation. Meeting the needs of professionals working in power electronics, as well as advanced engineering students, *Integrated Power Electronic Converters and Digital Control* explores the many benefits associated with integrated converters. This informative text details boost type, buck type, and buck-boost type integrated topologies, as well as other integrated structures. It discusses concepts behind their operation as well specific applications. Topics discussed include: Isolated DC-DC converters such as flyback, forward, push-pull, full-bridge, and half-bridge Power factor correction and its application Definition of the integrated switched-mode power supplies Steady-state analysis of the boost integrated flyback rectifier energy storage converter Dynamic analysis of the buck integrated forward converter Digital control based on the use of digital signal processors (DSPs) With innovations in digital control becoming ever more pervasive, system designers continue to introduce products that integrate digital power management and control integrated circuit solutions, both hybrid and pure digital. This detailed assessment of the latest advances in the field will help anyone working in power electronics and related industries stay ahead of the curve.

Embedded Systems Design - Steve Heath 2002-10-30

In this new edition the latest ARM processors and other hardware developments are fully covered along with new sections on Embedded Linux and the new freeware operating system eCOS. The hot topic of embedded systems and the internet is also introduced. In addition a fascinating new case study explores how embedded systems can be developed and experimented with using nothing more than a standard PC. * A practical introduction to the hottest topic in modern electronics design * Covers hardware, interfacing and programming

in one book * New material on Embedded Linux for embedded internet systems

Digital Signal Processing Laboratory, Second Edition - B. Preetham Kumar 2016-04-19

Considering the rapid evolution of digital signal processing (DSP), those studying this field require an easily understandable text that complements practical software and hardware applications with sufficient coverage of theory. Designed to keep pace with advancements in the field and elucidate lab work, Digital Signal Processing Laboratory, Second Edition was developed using material and student input from courses taught by the author. Contains a new section on digital filter structure Honed over the past several years, the information presented here reflects the experience and insight the author gained on how to convey the subject of DSP to senior undergraduate and graduate students coming from varied subject backgrounds. Using feedback from those students and faculty involved in these courses, this book integrates simultaneous training in both theory and practical software/hardware aspects of DSP. The practical component of the DSP course curriculum has proven to greatly enhance understanding of the basic theory and principles. To this end, chapters in the text contain sections on: Theory—Explaining the underlying mathematics and principles Problem solving—Offering an ample amount of workable problems for the reader Computer laboratory—Featuring programming examples and exercises in MATLAB® and Simulink® Hardware laboratory—Containing exercises that employ test and measurement equipment, as well as the Texas Instruments TMS320C6711DSP Starter Kit The text covers the progression of the Discrete and Fast Fourier transforms (DFT and FFT). It also addresses Linear Time-Invariant (LTI) discrete-time signals and systems, as well as the mathematical tools used to describe them. The author includes appendices that give detailed descriptions of hardware along with instructions on how to use the equipment featured in the book.

The Annotated C++ Reference Manual - Ellis 2007-02

Principles of Concurrent and Distributed Programming - M. Ben-Ari 2006

Principles of Concurrent and Distributed Programming provides an introduction to concurrent programming

focusing on general principles and not on specific systems. Software today is inherently concurrent or distributed - from event-based GUI designs to operating and real-time systems to Internet applications. This edition is an introduction to concurrency and examines the growing importance of concurrency constructs embedded in programming languages and of formal methods such as model checking.

Hydraulic Control Systems - Herbert E. Merritt 1991-09-03

The use of hydraulic control is rapidly growing and the objective of this book is to present a rational and well-balanced treatment of its components and systems. Coverage includes a review of applicable topics in fluid mechanisms; components encountered in hydraulic servo controlled systems; systems oriented issues and much more. Also offers practical suggestions concerning testing and limit cycle oscillation problems.

DSP Software Development Techniques for Embedded and Real-Time Systems - Robert Oshana 2006-01-09

Today's embedded and real-time systems contain a mix of processor types: off-the-shelf microcontrollers, digital signal processors (DSPs), and custom processors. The decreasing cost of DSPs has made these sophisticated chips very attractive for a number of embedded and real-time applications, including automotive, telecommunications, medical imaging, and many others—including even some games and home appliances. However, developing embedded and real-time DSP applications is a complex task influenced by many parameters and issues. DSP Software Development Techniques for Embedded and Real-Time Systems is an introduction to DSP software development for embedded and real-time developers giving details on how to use digital signal processors efficiently in embedded and real-time systems. The book covers software and firmware design principles, from processor architectures and basic theory to the selection of appropriate languages and basic algorithms. The reader will find practical guidelines, diagrammed techniques, tool descriptions, and code templates for developing and optimizing DSP software and firmware. The book also covers integrating and testing DSP systems as well as managing the DSP development effort. Digital signal processors (DSPs) are the future of microchips! Includes practical guidelines, diagrammed techniques, tool descriptions, and code templates to aid in the development and optimization of DSP software and firmware