Design Of A Pwm For Ups With Pulse Dead Time Ajer

This dissertation, "Design Optimization of Off-line Power Converters: From PWM to LLC Resonant Converteres" by Ruiyang, Yu, ???, was obtained from The University of Hong Kong (Pokfulam, Hong Kong) and is being sold pursuant to Creative Commons: Attribution 3.0 Hong Kong License. The content of this dissertation has not been altered in any way. We have altered the formatting in order to facilitate the ease of printing and reading of the dissertation. All rights not granted by the above license are retained by the author. Abstract: ?High power conversion efficiency is desirable in power supplies. Design optimization of on-line power converter is presented in this thesis. High efficiencies over a wide load range, for example 20%, 50% and 100% load, are often required. It is a challenge for on-line pulse-width modulation (PWM) converters to maintain good efficiencies with light load as well as full load. A two-stage multi-objective optimization procedure is proposed to optimization power converter efficiencies at 20%, 50% and 100% load. Two-FET forward prototype converters are built to verify the optimization results. The LLC (abbreviation of two resonant inductor L and one resonant capacitor C) series resonant converter can provide high power conversion efficiency because of the resonant nature and soft switching. The design of LLC resonant converter is more difficult than that of PWM converters since the LLC resonant converter has many resonant modes. Furthermore, the LLC resonant converter does not have analytical solution for its resonant operation. In this thesis, a systematic optimization procedure is proposed to optimize LLC series resonant converter efficiency. A mode solver technique is developed to solve LLC resonant converter operations. The proposed mode solver employs non-linear programming techniques to solve a set of LLC state equations and determine the resonant modes. Loss models are provided which serve as the objective-function to optimize converter efficiency. Optimization results show outstanding efficiency performance and experimental agreement with optimization. The optimization work extends to the LLC resonant converter with power factor correction (PFC) circuits where the effect of LLC converter input voltage variation cased by the PFC circuit is considered. Detail comparisons of PWM converter and LLC resonant converter loss profiles are also presented. The reasons that LLC resonant converter has higher efficiency are given and supported by quantitative data. Converter lifetime is highly related to component losses and temperature. The lifetime analysis is presented. The analysis reveals that the LLC resonant converter output capacitor is the weakest component concerning life. DOI: 10.5353/th_b4979964 Subjects: Electric current converters Pulse-duration modulation Electric resonators

This book constitutes the refereed proceedings of the Third International Conference on Information Computing and Applications, ICICA 2012, held in Chengde, China, in September 2012. The 100 revised full papers were carefully reviewed and selected from 1089 submissions. The papers are organized in topical sections on internet computing and applications, multimedia networking and computing, intelligent computing and applications, computational statistics and applications, cloud and evolutionary computing, computer engineering and applications, knowledge management and applications, communication technology and applications.

This volume includes extended and revised versions of a set of selected papers from the International Conference on Electric and Electronics (EEIC 2011) , held on June 20-22 , 2011, which is jointly organized by Nanchang University, Springer, and IEEE IAS Nanchang Chapter. The objective of EEIC 2011 Volume 2 is to provide a major interdisciplinary forum for the presentation of new approaches from Electrical engineering and controls, to foster integration of the latest developments in scientific research. 133 related topic papers were selected into this volume. All the papers were reviewed by 2 program committee members and selected by the volume editor Prof. Min Zhu. We hope every participant can have a good opportunity to exchange their research ideas and results and to discuss the state of the art in the areas of the Electrical engineering and controls.

This book contains the most comprehensive coverage available anywhere for two-level factorial designs. The re-analysis of 50 published examples serves as a how-to guide for analysis of the many types of full factorial and fractional factorial designs. By focusing on two-level designs, this book is accessible to a wide audience of practitioners who use planned experiments.

The authority on building empirical models and the fitting of such surfaces to data—completely updated and revised Revising and updating a volume that represents the essential source on building empirical models, George Box and Norman Draper—renowned authorities in this field—continue to set the standard with the Second Edition of Response Surfaces, Mixtures, and Ridge Analyses, providing timely new techniques, new exercises, and expanded material. A comprehensive introduction to building empirical models, this book presents the general philosophy and computational details of a number of important topics, including factorial designs at two levels; fitting first and second-order models; adequacy of estimation and the use of transformation; and occurrence and elucidation of ridge systems. Substantially rewritten, the Second Edition reflects the emergence of ridge analysis of second-order response surfaces as a very practical tool that can be easily applied in a variety of circumstances. This unique, fully developed coverage of ridge analysis—a technique for exploring quadratic response surfaces including surfaces in the space of mixture ingredients and/or subject to linear restrictions—includes MINITAB® routines for performing the calculations for any number of dimensions. Many additional figures are included in the new edition, and new exercises (many based on data from published papers) offer insight into the methods used. The exercises and their solutions provide a variety of supplementary examples of response surface use, forming an extremely important component of the text. Response Surfaces, Mixtures, and Ridge Analyses, Second Edition presents material in a logical and understandable arrangement and includes six new chapters covering an up-to-date presentation of standard ridge analysis (without restrictions); design and analysis of mixtures experiments; ridge analysis methods when there are linear restrictions in the experimental space including the mixtures experiments case, with or without further linear restrictions; and canonical reduction of second-order response surfaces in the foregoing general case. Additional features in the new edition include: New exercises with worked answers added throughout An extensive revision of Chapter 5: Blocking and Fractionating 2k Designs Additional discussion on the projection of two-level designs into lower dimensional spaces This is an ideal reference for researchers as well as a primary text for Response Surface Methodology graduate-level courses and a supplementary text for Design of Experiments courses at the upper-undergraduate and beginning-graduate levels.

The ultimate goal of spectrum-shaping technology is to provide the designer with the ability to specify a desired harmonic spectrum and then to realize it using a proper modulation scheme. The results of Pd-PWM and FM-PWM bring us one step closer to understanding how to meet this goal.

This work presents a systematic and comprehensive overview to the theory and applications of mechatronic processes, emphasizing the adaptation and incorporation of this important tool in fulfilling desired performance and quality requirements. The authors address the core technologies needed for the design and development of the mechatronic product, cover design

approaches, discuss related mechatronic product design aspects, and detail mechatronic product application examples.
Describes the life of a beaver and the methods he uses to dam streams and build himself a lodge.
Combinatorial mathematicians and statisticians have made a wide range of contributions to the development of block designs, and this book brings together much of that work. The designs developed for a specific problem are used in a variety of different settings. Applications include controlled sampling, randomized response, validation and valuation studies, intercropping experiments, brand cross-effect designs, lotto and tournaments. The intra- and inter- block, nonparametric and covariance analysis are discussed for general block designs, and the concepts of connectedness, orthogonality, and all types of balances in designs are carefully summarized. Readers are also introduced to the designs currently playing a prominent role in the field: alpha designs, trend-free designs, balanced treatment-control designs, nearest neighbor designs, and nested designs. This book provides the important background results required by researchers in block designs and related areas and prepares them for more complex research on the subject.
This invaluable textbook covers the theory and circuit design techniques to implement CMOS (Complementary Metal-Oxide Semiconductor) class-D audio amplifiers integrated circuits. The first part of the book introduces the motivation and fundamentals of audio amplification. The loudspeaker's operation and main audio performance metrics explains the limitations in the amplification process. The second part of this book presents the operating principle and design procedure of the class-D amplifier main architectures to provide the performance tradeoffs. The circuit design procedures involved in each block of the class-D amplifier architecture are highlighted. The third part of this book discusses several important design examples introducing state-of-the-art architectures and circuit design techniques to improve the audio performance, power consumption, and efficiency of standard class-D audio amplifiers.
This textbook is intended for engineering students taking courses in power electronics, renewable energy sources, smart grids or static power converters. It is also appropriate for students preparing a capstone project where they need to understand, model, supply, control and specify the grid side power converters. The main goal of the book is developing in students the skills that are required to design, control and use static power converters that serve as an interface between the ac grid and renewable power sources. The same skills can be used to design, control and use the static power converters used within the micro-grids and nano-grids, as the converters that provide the interface between such grids and the external grid. The author’s approach starts with basic functionality and the role of grid connected power converters in their typical applications, and their static and dynamic characteristics. Particular effort is dedicated to developing simple, concise, intuitive and easy-to-use mathematical models that summarize the essence of the grid side converter dynamics. Mathematics is reduced to a necessary minimum, solved examples are used extensively to introduce new concepts, and exercises are used to test mastery of new skills.
FLINS, originally an acronym for Fuzzy Logic and Intelligent Technologies in Nuclear Science, is now extended to Computational Intelligence for applied research. The contributions to the 10th of FLINS conference cover state-of-the-art research, development, and technology for computational intelligence systems, both from the foundations and the applications points-of-view.
Famed author Jack Ganssle has selected the very best embedded systems design material from the Newnes portfolio and compiled into this volume. The result is a book covering the gamut of embedded design—from hardware to software to integrated embedded systems—with a strong pragmatic emphasis. In addition to specific design techniques and practices, this book also discusses various approaches to solving embedded design problems and how to successfully apply theory to actual design tasks. The material has been selected for its timelessness as well as for its relevance to contemporary embedded design issues. This book will be an essential working reference for anyone involved in embedded system design! Table of Contents: Chapter 1. Motors - Stuart Ball Chapter 2. Testing – Arnold S. Berger Chapter 3. System-Level Design – Keith E. Curtis Chapter 4. Some Example Sensor, Actuator and Control Applications and Circuits (Hard Tasks) – Lewin ARW Edwards Chapter 5. Installing and Using a Version Control System – Chris Keydel and Olaf Meding Chapter 6. Embedded State Machine Implementation - Martin Gomez Chapter 7. Firmware Musings – Jack Ganssle Chapter 8. Hardware Musings – Jack Ganssle Chapter 9. Closed Loop Controls, Rabbits, and Hounds - John M. Holland Chapter 10. Application Examples David J. Katz and Rick Gentile Chapter 11. Analog I/Os – Jean LaBrosse Chapter 12. Optimizing DSP Software – Robert Oshana Chapter 13. Embedded Processors – Peter Wilson *Hand-picked content selected by embedded systems luminary Jack Ganssle *Real-world best design practices including chapters on FPGAs, DSPs, and microcontrollers *Covers both hardware and software aspects of embedded systems
This book offers a step-by-step guide to the experimental planning process and the ensuing analysis of normally distributed data, emphasizing the practical considerations governing the design of an experiment. Data sets are taken from real experiments and sample SAS programs are included with each chapter. Experimental design is an essential part of investigation and discovery in science; this book will serve as a modern and comprehensive reference to the subject.
This volume presents the main results of 2011 International Conference on Electronic Engineering, Communication and Management (EECM2011) held December 24-25, 2011, Beijing China. The EECM2011 is an integrated conference providing a valuable opportunity for researchers, scholars and scientists to exchange their ideas face to face together. The main focus of the EECM 2011 and the present 2 volumes “Advances in Electronic Engineering, Communication and Management” is on Power Engineering, Electrical engineering applications, Electrical machines, as well as Communication and Information Systems Engineering.
Embedded Systems with PIC Microcontrollers: Principles and Applications is a hands-on introduction to the principles and practice of embedded system design using the PIC microcontroller. Packed with helpful examples and illustrations, the book provides an in-depth treatment of microcontroller design as well as programming in both assembly language and C, along with advanced topics such as techniques of connectivity and networking and real-time operating systems. In this one book students get all they need to know to be highly proficient at embedded systems design. This text combines embedded systems principles with applications, using the16F84A, 16F873A and the 18F242 PIC microcontrollers. Students learn how to apply the principles using a multitude of sample designs and design ideas, including a robot in the form of an autonomous guide vehicle. Coverage between software and hardware is fully balanced, with full presentation given to microcontroller design and software programming, using both assembler and C. The book is accompanied by a companion website containing copies of all programs and software tools used in the text and a ‘student’ version of the C compiler. This textbook will be ideal for introductory courses and lab-based courses on embedded systems, microprocessors using the PIC microcontroller, as well as more advanced courses which use the 18F series and teach C programming in an embedded environment. Engineers in industry and informed hobbyists will also find this book a

valuable resource when designing and implementing both simple and sophisticated embedded systems using the PIC microcontroller. *Gain the knowledge and skills required for developing today's embedded systems, through use of the PIC microcontroller. *Explore in detail the 16F84A, 16F873A and 18F242 microcontrollers as examples of the wider PIC family. *Learn how to program in Assembler and C. *Work through sample designs and design ideas, including a robot in the form of an autonomous guided vehicle. *Accompanied by a CD-ROM containing copies of all programs and software tools used in the text and a ‘student' version of the C complier.

A heuristic introduction to experimental design; Optimum statistical experimental design as a branch of mathematical statistics; Definitios of the most important experimental designs; Properties and the construction of block designs; The nummber of nonisomorphic elementary bib in restricted; The analysis of block designs; The choice of optimal experimental designs; Appendix.

PWM DC-DC power converter technology underpins many energy conversion systems including renewable energy circuits, active power factor correctors, battery chargers, portable devices and LED drivers. Following the success of Pulse-Width Modulated DC-DC Power Converters this second edition has been thoroughly revised and expanded to cover the latest challenges and advances in the field. Key features of 2nd edition: Four new chapters, detailing the latest advances in power conversion, focus on: small-signal model and dynamic characteristics of the buck converter in continuous conduction mode; voltage-mode control of buck converter; small-signal model and characteristics of the boost converter in the discontinuous conduction mode and electromagnetic compatibility EMC. Provides readers with a solid understanding of the principles of operation, synthesis, analysis and design of PWM power converters and semiconductor power devices, including wide band-gap power devices (SiC and GaN). Fully revised Solutions for all end-of-chapter problems available to instructors via the book companion website. Step-by-step derivation of closed-form design equations with illustrations. Fully revised figures based on real data. With improved end-of-chapter summaries of key concepts, review questions, problems and answers, biographies and case studies, this is an essential textbook for graduate and senior undergraduate students in electrical engineering. Its superior readability and clarity of explanations also makes it a key reference for practicing engineers and research scientists.

Soft-switching PWM full-bridge converters have been widely usedin medium-to-high power dc-dc conversions for topologicalsimplicity, easy control and high efficiency. Early works onsoft-switching PWM full-bridge converter by many researchersincluded various topologies and modulation strategies. However, these works were scattered, and the relationship amongthese topologies and modulation strategies had not been revealed.This book intends to describe systematically the soft-switchingtechniques for pulse-width modulation (PWM) full-bridge converters,including the topologies, control and design, and it reveals therelationship among the various topologies and PWM strategiespreviously proposed by other researchers. The book not onlypresents theoretical analysis, but also gives many detailed designexamples of the converters.

Masterarbeit aus dem Jahr 2011 im Fachbereich Informatik - Technische Informatik, International Islamic University, Sprache: Deutsch, Abstract: Aim of this research work is to design a Red Green and Blue (RGB) Light Emitting Diode (LED) pixel driver that makes the development of RGB displays easier especially for small to medium size display boards. The existing system is using conventional shift registers fed by a local Field Programmable Gated Array (FPGA) based driver. Our intent was to have a single chip which can receive serial data and contains a surrogate controller to generate the different intensities by driving the RGB LEDs which might produce different colors. In our research, the core architecture of the controller chip is an eight bit (per color) wide Pulse Width Modulation (PWM) controller which generates 16.7 Million colors. Total PWM width for the three basic colors is 24 bits wide (per pixel). The chip contains 48 parallel PWM outputs along with serial-in-serial out data pins and other control inputs. After the successful simulation at behavioral level and post synthesis simulation; the design is transferred to schematics and then to layout. Mentor Graphics tools set for Application Specific Integrated Circuit (ASIC) Design flow are used with ASIC Design Kit from MOSIS having technology and feature size of AMI-0.5um or TSMC-0.35um. The dedicated design and its subsequent analysis have ramifications for chip-design engineers working in optoelectronics or photonics engineering industry.

This is the definitive reference for anyone involved in pulsewidth modulated DC-to-DC power conversion Pulsewidth Modulated DC-to-DC Power Conversion: Circuits, Dynamics, and Control Designs provides engineers, researchers, and students in the power electronics field with comprehensive and complete guidance to understanding pulsewidth modulated (PWM) DC-to-DC power converters. Presented in three parts, the book addresses the circuitry and operation of PWM DC-to-DC converters and their dynamic characteristics, along with in-depth discussions of control design of PWM DC-to-DC converters. Topics include: Basics of DC-to-DC power conversion DC-to-DC converter circuits Dynamic modeling Power stage dynamics Closed-loop performance Voltage mode control and feedback design Current mode control and compensation design Sampling effects of current mode control Featuring fully tested problems and simulation examples as well as downloadable lecture slides and ready-to-run PSpice programs, Pulsewidth Modulated DC-to-DC Power Conversion is an ideal reference book for professional engineers as well as graduate and undergraduate students.

Switched Mode Power Supply (SMPS) is the most prevailing architecture for DC power supply in modern systems, primarily for its capability to handle variable loads. Apart from efficiency the size and weight of the power supplies is becoming a great area of concern for the Power Supply Designers. In this thesis an AC to DC converter SMPS circuit, having a power MOSFET for switching operation and a PWM based Feedback circuit for driving the switching of the MOSFET, is designed and simulated in NI MULTISIM circuit design environment. Further the same circuit is Hardware implemented and tested using NI ELVIS Suite. In this design the line voltage at 220V/50Hz is taken as input, this voltage is stepped down, rectified and passed through filter capacitor to give an unregulated DC voltage. This unregulated voltage is chopped using a MOSFET switch, driven by PWM feedback signal, to control the output voltage level. An Isolation Transformer is used to isolate the DC output from input supply. The transformer output is again rectified by the high frequency Diode bridge rectifier and is filtered using a capacitor to give the regulated DC output. A Voltage regulator is connected to give the precise voltage output. The feedback network generates a high frequency PWM signal to drive the MOSFET switch. The dc voltage at the output depends on the width of the switching pulse. The pulse width is varied with the changes in the DC output voltage level, this change in the pulse width cancels the output voltage change and the SMPS output remains constant irrespective of load variations.

Intelligent readers who want to build their own embedded computer systems-- installed in everything from cell phones to cars to handheld organizers to refrigerators-- will find this book to be the most in-depth, practical, and up-to-date guide on the market. Designing Embedded Hardware carefully steers between the practical and philosophical aspects, so developers can both create their own devices and gadgets and customize and extend off-the-shelf systems. There are hundreds of books to choose from if

you need to learn programming, but only a few are available if you want to learn to create hardware. Designing Embedded Hardware provides software and hardware engineers with no prior experience in embedded systems with the necessary conceptual and design building blocks to understand the architectures of embedded systems. Written to provide the depth of coverage and real-world examples developers need, Designing Embedded Hardware also provides a road-map to the pitfalls and traps to avoid in designing embedded systems. Designing Embedded Hardware covers such essential topics as: The principles of developing computer hardware Core hardware designs Assembly language concepts Parallel I/O Analog-digital conversion Timers (internal and external) UART Serial Peripheral Interface Inter-Integrated Circuit Bus Controller Area Network (CAN) Data Converter Interface (DCI) Low-power operation This invaluable and eminently useful book gives you the practical tools and skills to develop, build, and program your own application-specific computers.

Unifying Electrical Engineering and Electronics Engineering is based on the Proceedings of the 2012 International Conference on Electrical and Electronics Engineering (ICEE 2012). This book collects the peer reviewed papers presented at the conference. The aim of the conference is to unify the two areas of Electrical and Electronics Engineering. The book examines trends and techniques in the field as well as theories and applications. The editors have chosen to include the following topics; biotechnology, power engineering, superconductivity circuits, antennas technology, system architectures and telecommunication.

Explore a fully updated reference for professional and student engineers working with pulsewidth modulated DC-to-DC power conversion The newly revised Second Edition of Pulsewidth Modulated DC-to-DC Power Conversion: Circuits, Dynamics, and Control Designs delivers a comprehensive exploration of pulsewidth modulated DC-to-DC converters for analysis and design as standalone converters and as an interconnected system. The book begins with discussions of the circuits, dynamics, and control of standalone PWM converters before moving on to examine the dynamic analysis and system design of DC power distribution systems. The distinguished authors balance theory with the practical aspects of DC-to-DC power conversion based on classical linear system theory. They include new information on the generalization of power stage modeling, the Nyquist criterion, and universal small-signal models for PWM DC-to-DC converters. The book also includes supplemental material, like a solutions manual, lecture slides, and PSpice source codes for over 250 PSpice programs for illustrative simulations. Readers will also benefit from the inclusion of: A thorough introduction to PWM DC-to-DC power conversion, power stage components, and buck converters An exploration of DC-to-DC power converter circuits, including boost converters, three basic converters, and flyback converters Discussions of the modeling and dynamics of PWM converters, including power stage transfer functions and the dynamic performance of PWM DC-to-DC converters An examination of control schemes and converter performance, including closed-loop performance and feedback compensation Perfect for senior undergraduate students in departments of electrical engineering or electronics, Pulsewidth Modulated DC-to-DC Power Conversion will also earn a place in the libraries of graduate students and practitioners of power electronics or electrical energy conversions, as well as analog/digital circuit engineers.

This useful reference describes the statistical planning and design of pharmaceutical experiments, covering all stages in the development process-including preformulation, formulation, process study and optimization, scale-up, and robust process and formulation development.Shows how to overcome pharmaceutical, technological, and economic constraint

The book is a collection of high-quality peer-reviewed research papers presented in Proceedings of International Conference on Artificial Intelligence and Evolutionary Algorithms in Engineering Systems (ICAEES 2014) held at Noorul Islam Centre for Higher Education, Kumaracoil, India. These research papers provide the latest developments in the broad area of use of artificial intelligence and evolutionary algorithms in engineering systems. The book discusses wide variety of industrial, engineering and scientific applications of the emerging techniques. It presents invited papers from the inventors/originators of new applications and advanced technologies.

Pulse-width modulation (PWM) is well established in power electronics as a basis for inverters with sinusoidal output voltages. It provides two crucial advantages: high power delivery efficiency and easy digital-to-analog demodulation. Thus PWM can be applied in audio signal processing chain as a switching function for a bridge inverter, and a low-pass filter extracts the audio. Meanwhile, this process is nonlinear. So it has often been assumed that implementation of PWM in audio benefited us with its efficiency improvement at the price of distortion. This work explored how PWM can be applied to provide high fidelity audio signal processing with nonlinearity compensation. The distortion effects are analyzed in depth. Noise-shaping processes that reduce quantization errors in the process are described. An inverter is presented that processes information directly in digital form PWM sequence with accurate correction added in the front end noise shaping module. The signal processing chain from digital input to the inverter gate drives is entirely digital. Simulation results confirm that a PWM inverter with efficient nonlinearity compensation can achieve high fidelity in practice.

Introduces chaos theory, its analytical methods and themeans to apply chaos to the switching power supplydesign DC-DC converters are typical switching systems which have plentyof nonlinear behaviors, such as bifurcation and chaos. Thenonlinear behaviors of DC-DC converters have been studied heavilyover the past 20 years, yet researchers are still unsure of thepractical application of bifurcations and chaos in switchingconverters. The electromagnetic interference (EMI), which resultedfrom the high rates of changes of voltage and current, has become amajor design criterion in DC-DC converters due to wide applicationsof various electronic devices in industry and daily life, and thequestion of how to reduce the annoying, harmful EMI has attractedmuch research interest. This book focuses on the analysis andapplication of chaos to reduce harmful EMI of DC-DC converters. After a review of the fundamentals of chaos behaviors of DC-DCconverters, the authors present some recent findings such asSymbolic Entropy, Complexity and Chaos Point Process, to analyzethe characters of chaotic DC-DC converters. Using these methods,the statistic characters of chaotic DC-DC converters are extractedand the foundations for the following researches of chaotic EMIsuppression are reinforced. The focus then transfers to estimatingthe power spectral density of chaotic PWM converters behind anintroduction of basic principles of spectrum analysis and chaoticPWM technique. Invariant Density, and Prony and Wavelet analysismethods are suggested for estimating the power spectral density ofchaotic PWM converters. Finally, some design-orientedapplications provide a good example of applying chaos theory inengineering practice, and illustrate the effectiveness onsuppressing EMI of the proposed chaotic PWM. Introduces chaos theory, its analytical methods and the meansto apply chaos to the switching power supply design Approaches the subject in a systematic manner from

analyzingmethod, chaotic phenomenon and EMI characteristics, analyticalmethods for chaos, and applying chaos to reduce EMI(electromagnetic interference) Highlights advanced research work in the fields of statisticcharacters of nonlinear behaviors and chaotic PWM technology tosuppress EMI of switching converters Bridges the gap between numerical theory and real-worldapplications, enabling power electronics designers to both analyzethe effects of chaos and leverage these effects to reduce EMI

I In this volume, the author demystifies the Design of Experiments (DOE). He begins with a clear explanation of the traditional experimentation process. He then covers the concept of variation and the importance of experimentation and follows through with applications. Stamatis also discusses full and fractional factorials. The strength of this volume lies in the fact that not only does it introduce the concept of robustness, it also addresses "Robust Designs" with discussions on the Taguchi methodology of experimentation. And throughout the author ties these concepts into the Six Sigma philosophy and shows readers how they use those concepts in their organizations.

This book provides a theoretical discussion of pulse width modulation (PWM) in power electronic inverters. Pulse width modulation is widely used for the frequency control of speed of ac motors, the design of uninterruptible power supplies (UPS) as well as the integration of renewable energy sources into existing power grid systems. PWM technique is based on approximation of sinusoidal waveforms by sequences (trains) of rectangular pulses whose widths are properly modulated. This width-modulation results in the suppression of low order harmonics at the expense of amplification of high order harmonics which are suppressed by energy-storage elements in load circuits. The discussion covers various PWM techniques with a focus on the optimal time-domain PWM techniques proposed by the authors.

Soft-Switching PWM Full-Bridge ConvertersTopologies, Control, and DesignJohn Wiley & Sons

A study to implement a single phase direct current (DC) to alternating current (AC) inverter based on digital signal processing and to evaluate several performance characteristics on the two pulse width modulation (PWM) switching schemes (bipolar and unipolar).

Many digital control circuits in current literature are described using analog transmittance. This may not always be acceptable, especially if the sampling frequency and power transistor switching frequencies are close to the band of interest. Therefore, a digital circuit is considered as a digital controller rather than an analog circuit. This helps to avoid errors and instability in high frequency components. Digital Signal Processing in Power Electronics Control Circuits covers problems concerning the design and realization of digital control algorithms for power electronics circuits using digital signal processing (DSP) methods. This book bridges the gap between power electronics and DSP. The following realizations of digital control circuits are considered: digital signal processors, microprocessors, microcontrollers, programmable digital circuits. Discussed in this book is signal processing, starting from analog signal acquisition, through its conversion to digital form, methods of its filtration and separation, and ending with pulse control of output power transistors. The book is focused on two applications for the considered methods of digital signal processing: an active power filter and a digital class D power amplifier. The major benefit to readers is the acquisition of specific knowledge concerning discussions on the processing of signals from voltage or current sensors using a digital signal processor and to the signals controlling the output inverter transistors. Included are some Matlab examples for illustration of the considered problems.

The 2014 Asia-Pacific Conference on Computer Science and Applications was held in Shanghai, December 27-28, 2014. These CSAC-2014 proceedings include 105 selected papers, which focus not only on the research of science and technology of computer sciences, but also on the research of applications, aiming at a quick and immediate effect on