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International MultiConference of Engineers and Computer Scientists 2016
Prognostics and Health Management of Electronics
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Next-Generation ADCs, High-Performance Power Management, and Technology Considerations for Advanced Integrated Circuits
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Self Aware Robots
Scientific and Technical Aerospace Reports
Design Note Collection
Measurement, Instrumentation, and Sensors Handbook
Test and Measurement: Know It All
Wireless Medical Systems and Algorithms
Immersion in the Black Art of Analog Design
Handbook of Sensor Networking

EDN with EEE
C and the 8051
Current Sensing Techniques and Biasing Methods for Smart Power Drivers
Op Amps for Everyone
Motion Planning

JORDYN GREGORY

Chapter 40. Current sense circuit collection: Making sense of current
Newnes
Analog circuit and system design today is more essential than ever before. With the growth of digital systems, wireless communications, complex industrial and automotive systems, designers are being challenged to develop sophisticated analog solutions. This comprehensive source book of circuit design solutions aids engineers with elegant and practical design techniques that focus on common analog challenges. The book's in-depth application examples provide insight into circuit design and application solutions that you can apply in today's demanding designs. This is the companion volume to the successful Analog Circuit Design: A Tutorial Guide to Applications and Solutions (October 2011), which has sold over 5000 copies in its the first 6 months of since publication. It extends the Linear Technology collection of application

notes, which provides analog experts with a full collection of reference designs and problem solving insights to apply to their own engineering challenges Full support package including online resources (LTSpice) Contents include more application notes on power management, and data conversion and signal conditioning circuit solutions, plus an invaluable circuit collection of reference designs

Intermediate Robot Building Universitätsverlag der TU Berlin

Next-Generation ADCs, High-Performance Power Management, and Technology Considerations for Advanced Integrated CircuitsAdvances in Analog Circuit Design 2019Springer Nature

Integrated Wide-Bandwidth Current Sensing Springer Science & Business Media

This thesis investigates potential technologies to increase the integration density of CubeSats. Observations of the CubeSat market and missions are recorded in order to derive design criteria for high performance single unit CubeSats. A promising approach to increased integration density is relocation of the components of multiple satellite subsystems to form a highly integrated, multi-functional solar panel. Eligible components are usually allocated to the communication system, the electric power system, or the attitude determination and control system. In a joint research project, development, optimization, and miniaturization of those components in order to form a highly integrated, multi-

functional solar panel is investigated. The author first summarizes the development work of the project partners for a picosatellite solar antenna and puts it into relation to the overall solar panel design. Advantage of using solar antennas over simple patch antennas is the reduced loss of solar cell area, and hence available electric power, that is usually accompanied by the usage of higher frequency bands for broadband payload data transmission. Magnetic attitude actuators are the backbone of CubeSat attitude control. In order to increase their performance and lower their resource consumption, numerical optimization of the commonly used three coil types is investigated by the author. This leads to the formulation of a novel optimization approach, which is better suited to real-world considerations for magnetic actuator design. Results from the application of the optimization procedure show potential for every coil type. The state of the art of a novel type of attitude control actuators, so-called fluid-dynamic actuators which are based on angular momentum exchange, is advanced by the author by introducing miniaturized 3D-printed conduits for single unit CubeSat applications. Following development and functional verification, actuators are compared to existing reaction wheel systems, which shows their superiority for agile attitude maneuvers and integration with the satellite bus. Further investigation exploits additive manufacturing technologies to create redundancy

concepts using four actuators with three-dimensional conduits.Finally, development, optimization, and miniaturization of subsystem components is brought together in the design, assembly, and test of a highly integrated, multi-functional solar panel. Analysis of a single unit CubeSat design that applies different configurations of the multi-functional solar panel shows the potential for more than 50% payload mass and payload volume. This brings integration density of single unit CubeSats to a level similar to that of the larger triple unit form factors currently employed for the New Space mega-constellations. Diese Dissertation untersucht mögliche Technologien zur Erhöhung der Integrationsdichte von CubeSats. Beobachtungen des CubeSat-Marktes und ausgewählter Missionen werden zusammengetragen um Entwurfskriterien für hochperformante 1U CubeSats abzuleiten. Ein vielversprechender Ansatz zur Erhöhung der Integrationsdichte ist der Umzug von Komponenten verschiedener Satellitensubsysteme auf ein zu entwickelndes hochintegriertes, multifunktionales Solarpaneel. Infrage kommende Komponenten sind für gewöhnlich dem Kommunikationssystem, dem Energieversorgungssystem, oder dem Lageregelungssystem zugeordnet. In Rahmen eines gemeinschaftlichen Forschungsvorhabens wurden Entwicklung, Optimierung, und Miniaturisierung ausgewählter Komponenten eines solchen

hochintegrierten, multifunktionalen Paneels untersucht. Durch den Autor wird zunächst die Entwicklung einer Solarantenne für Pikosatelliten durch den Projektpartner zusammengefasst und in Zusammenhang um Entwurf des Solarpaneels gebracht. Der Vorteil einer Solarantenne gegenüber einer einfachen Patch-Antenne ist der geringere Verlust an Solarzellenfläche, und damit zur Verfügung stehender elektrischer Leistung, der üblicherweise mit der Verwendung höherer Frequenzbänder zur breitbandigen Nutzlastdatenübertragung einhergeht. Magnetische Lageregelungsaktuatoren bilden das Rückgrat der CubeSat-Lageregelung. Um deren Leistungsfähigkeit zu erhöhen und den Ressourcenverbrauch zu verringern, wird durch den Autor die numerische Optimierung der drei gebräuchlichen Spulentypen untersucht. Dies führt zur Formulierung eines neuartigen Optimierungsansatzes welcher besser für die Anwendung realer Entwurfsprobleme geeignet ist. Die Optimierungsergebnisse zeigen ein großes Potential für die Optimierung aller betrachteter Spulentypen auf. Der Stand der Technik im Bereich neuartiger Lageregelungsaktuatoren, den sogenannten fluiddynamischen Aktuatoren die auf Drehimpulsaustausch basieren, wird durch den Autor durch die Einführung miniaturisierter 3D-gedruckter Kanäle für die Verwendung auf 1U CubeSats vorangebracht. Im Anschluss an die Entwicklung und funktionale Verifikation werden diese

Aktuatoren mit existierenden Reaktionsradsystemen verglichen, was deren Überlegenheit bei agilen Lageregelungsmanövern und der Integration in den Satellitenbus aufzeigt. Weitere Untersuchungen nutzen die additiven Herstellungsverfahren zur Darstellung von redundanten Konzepten bestehend aus vier Aktuatoren mit dreidimensionalen Kanalgeometrien. Abschließend werden Entwicklung, Optimierung und Miniaturisierung der Subsystemkomponenten im Entwurf, Aufbau und Test eines hochintegrierten, multifunktionalen Seitenwandpaneels zusammengeführt. Die Analyse eines 1U CubeSat-Entwurfs unter Verwendung verschiedener Konfigurationen des multifunktionalen Solarpaneels zeigt ein Potential für jeweils mehr als 50% verfügbarer Nutzlastmasse und Nutzlastvolumen vom gesamten Satelliten. Dies hebt die Integrationsdichte von 1U CubeSats auf ein ähnliches Niveau der 3U Formfaktoren, welche gegenwärtig bei den New Space Megakonstellationen zur Anwendung kommen.

Transactions on Engineering Technologies CRC Press

The operational amplifier ("op amp") is the most versatile and widely used type of analog IC, used in audio and voltage amplifiers, signal conditioners, signal converters, oscillators, and analog computing systems. Almost every electronic device uses at least one op amp. This book is Texas Instruments' complete professional-level tutorial and reference to operational amplifier theory

and applications. Among the topics covered are basic op amp physics (including reviews of current and voltage division, Thevenin's theorem, and transistor models), idealized op amp operation and configuration, feedback theory and methods, single and dual supply operation, understanding op amp parameters, minimizing noise in op amp circuits, and practical applications such as instrumentation amplifiers, signal conditioning, oscillators, active filters, load and level conversions, and analog computing. There is also extensive coverage of circuit construction techniques, including circuit board design, grounding, input and output isolation, using decoupling capacitors, and frequency characteristics of passive components. The material in this book is applicable to all op amp ICs from all manufacturers, not just TI. Unlike textbook treatments of op amp theory that tend to focus on idealized op amp models and configuration, this title uses idealized models only when necessary to explain op amp theory. The bulk of this book is on real-world op amps and their applications; considerations such as thermal effects, circuit noise, circuit buffering, selection of appropriate op amps for a given application, and unexpected effects in passive components are all discussed in detail. *Published in conjunction with Texas Instruments *A single volume, professional-level guide to op amp theory and applications *Covers circuit board layout techniques for manufacturing op amp circuits.

Measuring Current, Voltage and Power
John Wiley & Sons
Power Supplies for LED Driving, Second Edition explores the wide use of light-emitting diodes due to their efficient use of power. The applications for power LEDs include traffic lights, street lamps, automotive lighting, architectural lights, theatre lighting, household light replacements, signage lighting (replacing neon strip lights and fluorescent tubes), LCD display backlighting, and many more. Powering (driving) these LED's is not always simple. Linear driving is inefficient and generates far too much heat. With a switching supply, the main issues are EMI, efficiency, and of course cost. This book covers the design trade-offs involved in LED driving applications, from low-power, to UB-LEDs and beyond. Provides a practical, hands-on approach to power supply design for LED drivers Contains detailed examples of what works throughout the design process Presents commentary on how the calculated component value compares with the actual value used, including a description of why the choice was made
BoD – Books on Demand
Microsystems technologies have found their way into an impressive variety of applications, from mobile phones, computers, and displays to smart grids, electric cars, and space shuttles. This multidisciplinary field of research extends the current capabilities of standard integrated circuits in terms of materials and designs and complements them by creating innovative components

and smaller systems that require lower power consumption and display better performance. Novel Advances in Microsystems Technologies and their Applications delves into the state of the art and the applications of microsystems and microelectronics-related technologies. Featuring contributions by academic and industrial researchers from around the world, this book: Examines organic and flexible electronics, from polymer solar cell to flexible interconnects for the co-integration of micro-electromechanical systems (MEMS) with complementary metal oxide semiconductors (CMOS) Discusses imaging and display technologies, including MEMS technology in reflective displays, the fabrication of thin-film transistors on glass substrates, and new techniques to display and quickly transmit high-quality images Explores sensor technologies for sensing electrical currents and temperature, monitoring structural health and critical industrial processes, and more Covers biomedical microsystems, including biosensors, point-of-care devices, neural stimulation and recording, and ultra-low-power biomedical systems Written for researchers, engineers, and graduate students in electrical and biomedical engineering, this book reviews groundbreaking technology, trends, and applications in microelectronics. Its coverage of the latest research serves as a source of inspiration for anyone interested in further developing microsystems technologies and creating new applications.

Analog Circuit Design Volume 2 Elsevier
Wireless Medical Systems and Algorithms: Design and Applications provides a state-of-the-art overview of the key steps in the development of wireless medical systems, from biochips to brain–computer interfaces and beyond. The book also examines some of the most advanced algorithms and data processing in the field. Addressing the latest challenges and solutions related to the medical needs, electronic design, advanced materials chemistry, wireless body sensor networks, and technologies suitable for wireless medical devices, the text: Investigates the technological and manufacturing issues associated with the development of wireless medical devices Introduces the techniques and strategies that can optimize the performances of algorithms for medical applications and provide robust results in terms of data reliability Includes a variety of practical examples and case studies relevant to engineers, medical doctors, chemists, and biologists Wireless Medical Systems and Algorithms: Design and Applications not only highlights new technologies for the continuous surveillance of patient health conditions, but also shows how disciplines such as chemistry, biology, engineering, and medicine are merging to produce a new class of smart devices capable of managing and monitoring a wide range of cognitive and physical disabilities.

Electric Vehicles: Prospects and Challenges John Wiley & Sons
This authoritative new book focuses on

recent developments in the instrumentation for sending voltages and currents. It covers new trends and challenges in the field, such as measurements of biocurrents, the increased speed of the components for data taking, testing of computers and integrated circuits where the measurement of rapid voltage and current variations on a very small geometrical scale is necessary. The first chapter concentrates on recent methods to sense voltages and currents, while the rest of the book investigates the applied side, covering for instance electrical power and energy measurements. The main purpose of this volume is to illustrate commonly employed techniques rather than track the scientific evolution and merits and therefore mainly covers patent literature aimed at industrial applications. It is an exciting addition, justifying the series' claim to cover state-of-the-art developments in both the applied and theoretical fields of sensors and actuators. The measurement of voltages and currents is a common task in the field of electricity and electronics. From a technical point of view it is useful to identify schematically different steps of such a measurement. In a first step a voltage or a current is sensed, intermediate steps such as amplification, transmission and further treatment may follow to yield the result in the final step. Today in most cases microprocessors perform the final steps of such measurements. Analog-to digital converters digitise a voltage that is

proportional to the value to be measured and a processor performs further computations and handles the storage and the display of the results. The prerequisite for such measurements are sensors or transducers that respond in a known way to the voltage or current to be measured. The emphasis of this book is put on recent developments of the instrumentation for sensing voltages and currents. Aside from the general trend towards smaller, cheaper and more reliable instrumentation, new demands have arisen. New applications, like measurements of biocurrents, ask for higher sensitivities. Computers and integrated circuits pose new challenges. To exploit the increased speed of the components for data taking, suitable sensors are required. The accuracy that can be achieved depends more than ever on the first step, the acquisition of the raw data. The influence of the measurement process on the results becomes more crucial. Testing of integrated circuits themselves is a completely new application. For such tests one has to measure rapid voltage and current variations on very small geometrical scales. Here, as well as in the traditional high voltage applications, contactless measurements play an important role. The organisation of this book is as follows: In the first chapter different methods to sense voltages and currents are described. For the sake of completeness most commonly used methods are mentioned, we concentrate, however, on those developed recently. The chapters

address the subject from the side of different applications in which voltages and currents are sensed. Since the main purpose of this publication is to illustrate commonly employed techniques rather than to track the scientific evolution and merits in particular fields, in general those publications that illustrate a particular measurement principle best have been cited. The citation of a particular reference does therefore not imply that this is the first or most pertinent publication in the respective field.

Advanced Technologies and Applications

Cambridge University Press

The Second Edition of the bestselling Measurement, Instrumentation, and Sensors Handbook brings together all aspects of the design and implementation of measurement, instrumentation, and sensors. Reflecting the current state of the art, it describes the use of instruments and techniques for performing practical measurements in engineering, physics, chemistry, and the life sciences and discusses processing systems, automatic data acquisition, reduction and analysis, operation characteristics, accuracy, errors, calibrations, and the incorporation of standards for control purposes. Organized according to measurement problem, the Electromagnetic, Optical, Radiation, Chemical, and Biomedical Measurement volume of the Second Edition: Contains contributions from field experts, new chapters, and updates to all 98 existing chapters Covers sensors and sensor

technology, time and frequency, signal processing, displays and recorders, and optical, medical, biomedical, health, environmental, electrical, electromagnetic, and chemical variables A concise and useful reference for engineers, scientists, academic faculty, students, designers, managers, and industry professionals involved in instrumentation and measurement research and development, Measurement, Instrumentation, and Sensors Handbook, Second Edition: Electromagnetic, Optical, Radiation, Chemical, and Biomedical Measurement provides readers with a greater understanding of advanced applications. Novel Advances in Microsystems Technologies and Their Applications CRC Press

Medical imaging has transformed the ways in which various conditions, injuries, and diseases are identified, monitored, and treated. As various types of digital visual representations continue to advance and improve, new opportunities for their use in medical practice will likewise evolve. Medical Imaging: Concepts, Methodologies, Tools, and Applications presents a compendium of research on digital imaging technologies in a variety of healthcare settings. This multi-volume work contains practical examples of implementation, emerging trends, case studies, and technological innovations essential for using imaging technologies for making medical decisions. This comprehensive publication is an essential resource for medical

practitioners, digital imaging technologists, researchers, and medical students.

Self-Sufficiency of an Autonomous Reconfigurable Modular Robotic Organism IGI Global

In cyber-physical systems (CPS), sensors and embedded systems are networked together to monitor and manage a range of physical processes through a continuous feedback system. This allows distributed computing using wireless devices. Cyber-Physical Systems—A Computational Perspective examines various developments of CPS that are impacting our daily lives and sets the stage for future directions in this domain. The book is divided into six sections. The first section covers the physical infrastructure required for CPS, including sensor networks and embedded systems. The second section addresses energy issues in CPS with the use of supercapacitors and reliability assessment. In the third section, the contributors describe the modeling of CPS as a network of robots and explore issues regarding the design of CPS. The fourth section focuses on the impact of ubiquitous computing and cloud computing in CPS and the fifth section discusses security and privacy issues in CPS. The final section covers the role of CPS in big data analytics, social network analysis, and healthcare. As CPS are becoming more complex, pervasive, personalized, and dependable, they are moving beyond niche laboratories to real-life application areas, such as robotics, smart grids, green computing,

and healthcare. This book provides you with a guide to current CPS research and development that will contribute to a "smarter" planet.

Design Reference Springer

This volume contains selected revised and extended research articles written by prominent researchers who participated in the International MultiConference of Engineers and Computer Scientists 2016, held in Hong Kong, 16-18 March 2016. Topics covered include engineering physics, communications systems, control theory, automation, engineering mathematics, scientific computing, electrical engineering, and industrial applications. The book showcases the tremendous advances in engineering technologies and applications, and also serves as an excellent reference work for researchers and graduate students working on engineering technologies, physical sciences and their applications.

Digitally-Assisted Analog and Analog-Assisted Digital IC Design Springer

This totally reworked book combines two previous books with material on networking. It is a complete guide to programming and interfacing the 8051 microcontroller-family devices for embedded applications.

Fundamentals, Machine Learning, and the Internet of Things Newnes

In-depth coverage of instrumentation and measurement from the Wiley Encyclopedia of Electrical and Electronics Engineering The Wiley Survey of Instrumentation and Measurement features 97 articles

selected from the Wiley Encyclopedia of Electrical and Electronics Engineering, the one truly indispensable reference for electrical engineers. Together, these articles provide authoritative coverage of the important topic of instrumentation and measurement. This collection also, for the first time, makes this information available to those who do not have access to the full 24-volume encyclopedia. The entire encyclopedia is available online-visit www.interscience.wiley.com/EEEE for more details. Articles are grouped under sections devoted to the major topics in instrumentation and measurement, including: * Sensors and transducers * Signal conditioning * General-purpose instrumentation and measurement * Electrical variables * Electromagnetic variables * Mechanical variables * Time, frequency, and phase * Noise and distortion * Power and energy * Instrumentation for chemistry and physics * Interferometers and spectrometers * Microscopy * Data acquisition and recording * Testing methods The articles collected here provide broad coverage of this important subject and make the Wiley Survey of Instrumentation and Measurement a vital resource for researchers and practitioners alike

Development Trends of Motorcycles II

Elsevier

An indispensable guide for engineers and data scientists in design, testing, operation, manufacturing, and maintenance A road map to the current challenges and available opportunities

for the research and development of Prognostics and Health Management (PHM), this important work covers all areas of electronics and explains how to: assess methods for damage estimation of components and systems due to field loading conditions assess the cost and benefits of prognostic implementations develop novel methods for in situ monitoring of products and systems in actual life-cycle conditions enable condition-based (predictive) maintenance increase system availability through an extension of maintenance cycles and/or timely repair actions; obtain knowledge of load history for future design, qualification, and root cause analysis reduce the occurrence of no fault found (NFF) subtract life-cycle costs of equipment from reduction in inspection costs, downtime, and inventory Prognostics and Health Management of Electronics also explains how to understand statistical techniques and machine learning methods used for diagnostics and prognostics. Using this valuable resource, electrical engineers, data scientists, and design engineers will be able to fully grasp the synergy between IoT, machine learning, and risk assessment.

Switching Power Supplies A - Z

Newnes

Today's smartphones utilize a rapidly developing range of sophisticated applications, pushing the limits of mobile processing power. The increased demand for cell phone applications has necessitated the rise of mobile cloud computing, a technological research

arena which combines cloud computing, mobile computing, and wireless networks to maximize the computational and data storage capabilities of mobile devices. Enabling Real-Time Mobile Cloud Computing through Emerging Technologies is an authoritative and accessible resource that incorporates surveys, tutorials, and the latest scholarly research on cellular technologies to explore the latest developments in mobile and wireless computing technologies. With its exhaustive coverage of emerging techniques, protocols, and computational structures, this reference work is an ideal tool for students, instructors, and researchers in the field of telecommunications. This reference work features astute articles on a wide range of current research topics including, but not limited to, architectural communication components (cloudlets), infrastructural components, secure mobile cloud computing, medical cloud computing, network latency, and emerging open source structures that optimize and accelerate smartphones.

Contributions to the advance of the integration density of CubeSats

Apress

For readers of Robot Building for Beginner (Apress, 2002 and 2009), welcome to the next level. Intermediate Robot Building, Second Edition offers you the kind of real-world knowledge that only renowned author David Cook can offer. In this book, you'll learn the value of a robot heartbeat and the purpose of

the wavy lines in photocells. You'll find out what electronic part you should sand. You'll discover how a well-placed switch can help a robot avoid obstacles better than a pair of feelers. And you'll avoid mistakes that can cause a capacitor to explode. Want a robot that can explore rooms, follow lines, or battle opponents in mini-sumo? This book presents step-by-step instructions and circuit and part descriptions so that you can build the robot featured in the book or apply the modules to your own robot designs. Finally, you'll find the complete schematics for Roundabout, a room explorer that requires no programming and uses only off-the-shelf electronics. With Roundabout, you'll use many of the same techniques used by professional robotics engineers, and you'll experience many of the same challenges and joys they feel when a robot "comes to life."

Proceedings CRC Press

A contemporary evaluation of switching power design methods with real world applications • Written by a leading author renowned in his field • Focuses on switching power supply design, manufacture and debugging • Switching power supplies have relevance for contemporary applications including mobile phone chargers, laptops and PCs • Based on the authors' successful "Switching Power Optimized Design 2nd Edition" (in Chinese) • Highly illustrated with design examples of real world applications

Official Gazette of the United States Patent and Trademark Office

PageFree Publishing, Inc.

Beginning with an introduction to cryptography, Hardware Security: Design, Threats, and Safeguards explains the underlying mathematical principles needed to design complex cryptographic algorithms. It then presents efficient cryptographic algorithm implementation methods, along with state-of-the-art research and strategies for the design of very large scale integrated (VLSI) circuits and symmetric cryptosystems, complete with examples of Advanced Encryption Standard (AES) ciphers, asymmetric ciphers, and elliptic curve cryptography (ECC). Gain a Comprehensive Understanding of Hardware Security—from Fundamentals to Practical Applications Since most implementations of standard cryptographic algorithms leak information that can be exploited by adversaries to gather knowledge about secret encryption keys, Hardware Security: Design, Threats, and Safeguards: Details algorithmic- and circuit-level countermeasures for attacks based on power, timing, fault, cache, and scan chain analysis Describes hardware intellectual property piracy and protection techniques at different levels of abstraction based on watermarking Discusses hardware obfuscation and physically unclonable functions (PUFs), as well as Trojan modeling, taxonomy, detection, and prevention Design for Security and Meet Real-Time Requirements If you consider security as critical a metric for integrated circuits (ICs) as power, area,

and performance, you'll embrace the design-for-security methodology of Hardware Security: Design, Threats, and Safeguards.

International MultiConference of Engineers and Computer Scientists 2016 CRC Press

In this book, new results or developments from different research backgrounds and application fields are put together to provide a wide and useful viewpoint on these headed research problems mentioned above, focused on the motion planning problem of mobile ro-bots. These results cover a large range of the problems that are frequently encountered in the motion planning of mobile robots both in theoretical methods and practical applications including obstacle avoidance methods, navigation and localization techniques, environmental modelling or map building methods, and vision signal processing etc. Different methods such as potential fields, reactive behaviours, neural-fuzzy based methods, motion control methods and so on are studied. Through this book and its references, the reader will definitely be able to get a thorough overview on the current research results for this specific topic in robotics. The book is intended for the readers who are interested and active in the field of robotics and especially for those who want to study and develop their own methods in motion/path planning or control for an intelligent robotic system.