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Robot Control 1988 (SYROCO'88) - U. Rembold 2014-05-23
Containing 88 papers, the emphasis of this volume is on the control of advanced robots. These robots may be self-contained or part of a system. The applications of such robots vary from manufacturing, assembly and material handling to space work and rescue operations. Topics presented at the Symposium included sensors and robot vision systems as well as the planning and control of robot actions. Main topics covered include the design of control systems and their implementation; advanced sensors and multisensor systems; explicit robot programming; implicit (task-orientated) robot programming; interaction between programming and control systems; simulation as a programming aid; AI techniques for advanced robot systems and autonomous robots.

Dynamic and Robust Streaming in and between Connected Consumer-Electronic Devices - Peter van der Stok 2006-03-30
Dynamic and Robust Streaming in and between Connected Consumer-Electronic Devices addresses a subject that is becoming more important over the years. On the one hand the arrival of home networks is imminent, and on the other hand we notice that chips integrate more and more functionality. The home network interconnects the Consumer Electronic (CE) devices in the home, and the individual CE-devices incorporate the chips to realize a ubiquitous streaming of video streams over this network. This book provides a comprehensive overview of the challenges that face us. The book shows that there are many similarities between traditional networking and networks in the chip. However, there are some different operational conditions that lead to original solutions. Dynamic and Robust Streaming in and between Connected Consumer-Electronic Devices focuses on the robustness aspects of the chosen technologies in the area of video streaming. Management of resources such as memory, bandwidth, CPU cycles, bus–cycles is an aspect that is prominent in many of the sections.

Handbook of Real-Time and Embedded Systems - Insup Lee 2007-07-23
Real-time and embedded systems are essential to our lives, from controlling car engines and regulating traffic lights to monitoring plane takeoffs and landings to providing up-to-the-minute stock quotes. Bringing together researchers from both academia and industry, the Handbook of Real-Time and Embedded Systems provides comprehensive covera

Systematic Methodology for Real-Time Cost-Effective Mapping of Dynamic Concurrent Task-Based Systems on Heterogenous Platforms - Zhe Ma 2007-08-26
A genuinely useful text that gives an overview of the state-of-the-art in system-level design trade-off explorations for concurrent tasks running on embedded heterogeneous multiple processors. The targeted application domain covers complex embedded real-time multi-media and communication applications. This material is mainly based on research at IMEC and its international university network partners in this area over the last decade. In all, the material those in the digital signal processing industry will find here is bang up-to-date.

Dynamic System Reconfiguration in Heterogeneous Platforms - Nikolaos Voros 2009-05-28
Dynamic System Reconfiguration in Heterogeneous Platforms defines the MORPHEUS platform that can join the performance density advantage of reconfigurable technologies and the easy control capabilities of

general purpose processors. It consists of a System-on-Chip made of a scalable system infrastructure hosting heterogeneous reconfigurable accelerators, providing dynamic reconfiguration capabilities and data-stream management capabilities.

Cellular Neural Networks: Dynamics and Modelling - A. Slavova 2013-06-29
Conventional digital computation methods have run into a se rious speed bottleneck due to their serial nature. To overcome this problem, a new computation model, called Neural Networks, has been proposed, which is based on some aspects of neurobiology and adapted to integrated circuits. The increased availability of com puting power has not only made many new applications possible but has also created the desire to perform cognitive tasks which are easily carried out by the human brain. It become obvious that new types of algorithms and/or circuits were necessary to cope with such tasks. Inspiration has been sought from the functioning of the hu man brain, which led to the artificial neural network approach. One way of looking at neural networks is to consider them to be arrays of nonlinear dynamical systems that interact with each other. This book deals with one class of locally coupled neural net works, called Cellular Neural Networks (CNNs). CNNs were intro duced in 1988 by L. O. Chua and L. Yang [27,28] as a novel class of information processing systems, which posseses some of the key fea tures of neural networks (NNs) and which has important potential applications in such areas as image processing and pattern reco gnition. Unfortunately, the highly interdisciplinary nature of the research in CNNs makes it very difficult for a newcomer to enter this important and fasciriating area of modern science.

On-Chip Interconnect with aelite - Andreas Hansson 2010-10-20
The book provides a comprehensive description and implementation methodology for the Philips/NXP Aethereal/aelite Network-on-Chip (NoC). The presentation offers a systems perspective, starting from the system requirements and deriving and describing the resulting hardware architectures, embedded software, and accompanying design flow. Readers get an in depth view of the interconnect requirements, not centered only on performance and scalability, but also the multi-faceted, application-driven requirements, in particular composability and predictability. The book shows how these qualitative requirements are implemented in a state-of-the-art on-chip interconnect, and presents the realistic, quantitative costs.

Vision Chips - Alireza Moini 2012-12-06
This chapter presents a set of introductory material, which in addition to providing a general view on the topic, highlights the importance of research in this area. It also presents a short history of the design of smart vision sensors, and points out some of the fundamental issues in the design of such sensors. 1. 1 A General Overview Machine vision is one of the main branches of artificial intelligence. The richness of information present in images makes them the first choice as an input to an artificial system which tries to interact with its environment. A large proportion of the brain of many advanced species is dedicated to visual information processing, which illustrates the importance of visual information in biological systems. Biological visual systems have evolved over millions of years, and each specie has developed a specialized visual system tailored for the essential tasks of survival, such as catching a prey, or escaping a predator. Implementing electronic hardware for image processing, therefore, may benefit from the underlying

fundamental aspects of biological vision, though in no respect should this be regarded as a solid framework for electronic vision systems. Traditionally, computer vision algorithms are performed on images captured by conventional cameras, and processing is accomplished by means of general purpose digital computers. More advanced systems utilize dedicated hardware to speed up the processing stage.

Synaptic Plasticity for Neuromorphic Systems - Christian Mayr 2016-06-26
One of the most striking properties of biological systems is their ability to learn and adapt to ever changing environmental conditions, tasks and stimuli. It emerges from a number of different forms of plasticity, that change the properties of the computing substrate, mainly acting on the modification of the strength of synaptic connections that gate the flow of information across neurons. Plasticity is an essential ingredient for building artificial autonomous cognitive agents that can learn to reliably and meaningfully interact with the real world. For this reason, the neuromorphic community at large has put substantial effort in the design of different forms of plasticity and in putting them to practical use. These plasticity forms comprise, among others, Short Term Depression and Facilitation, Homeostasis, Spike Frequency Adaptation and diverse forms of Hebbian learning (e.g. Spike Timing Dependent Plasticity). This special research topic collects the most advanced developments in the design of the diverse forms of plasticity, from the single circuit to the system level, as well as their exploitation in the implementation of cognitive systems.

Advanced Topics on Cellular Self-organizing Nets and Chaotic Nonlinear Dynamics to Model and Control Complex Systems - Riccardo Caponetto 2008
This book focuses on the research topics investigated during the three-year research project funded by the Italian Ministero dell'Istruzione, dell'Universite e della Ricerca (MIUR: Ministry of Education, University and Research) under the FIRB project RBNE01CW3M. With the aim of introducing newer perspectives of the research on complexity, the final results of the project are presented after a general introduction to the subject. The book is intended to provide researchers, PhD students, and people involved in research projects in companies with the basic fundamentals of complex systems and the advanced project results recently obtained.

Intelligent Human Computer Interaction - Anupam Basu 2017-01-20
This book constitutes the proceedings of the 8th International Conference on Intelligent Human Computer Interaction, IHCI 2016, held in Pilani, India, in December 2016. The 22 regular papers and 3 abstracts of invited talks included in this volume were carefully reviewed and selected from 115 initial submissions. They deal with intelligent interfaces; brain machine interaction; HCI applications and technology; and interface and systems.

Advancing Embedded Systems and Real-Time Communications with Emerging Technologies - Virtanen, Seppo 2014-04-30
Embedded systems and real-time computing can be useful tools for a variety of applications. Further research developments in this field can assist in promoting the future development of these technologies for various applications. Advancing Embedded Systems and Real-Time Communications with Emerging Technologies discusses embedded systems, communication system engineering, and real-time systems in an integrated manner. This research book includes advancements in the fields of computer science, computer engineering, and telecommunication engineering in regard to how they are used in embedded and real-time systems for communications purposes. With its practical and theoretical research, this book is an essential reference for academicians, students, researchers, practitioners, and IT professionals.

Real-Time Systems, Architecture, Scheduling, and Application - Seyed Morteza Babamir 2012-04-11
This book is a rich text for introducing diverse aspects of real-time systems including architecture, specification and verification, scheduling and real world applications. It is useful for advanced graduate students and researchers in a wide range of disciplines impacted by embedded computing and software. Since the book covers the most recent advances in real-time systems and communications networks, it serves as a vehicle for technology transition within the real-time systems community of systems architects, designers, technologists, and system analysts. Real-time applications are used in daily operations, such as engine and break mechanisms in cars, traffic light and air-traffic control and heart beat and blood pressure monitoring. This book includes 15 chapters arranged in 4 sections, Architecture (chapters 1-4), Specification and Verification (chapters 5-6), Scheduling (chapters 7-9) and Real word applications

(chapters 10-15).

Artificial Neural Networks and Machine Learning -- ICANN 2013 - Valeri Mladenov 2013-09-04
The book constitutes the proceedings of the 23rd International Conference on Artificial Neural Networks, ICANN 2013, held in Sofia, Bulgaria, in September 2013. The 78 papers included in the proceedings were carefully reviewed and selected from 128 submissions. The focus of the papers is on following topics: neurofinance graphical network models, brain machine interfaces, evolutionary neural networks, neurodynamics, complex systems, neuroinformatics, neuroengineering, hybrid systems, computational biology, neural hardware, bioinspired embedded systems, and collective intelligence.

Embedded Systems Design Using the Rabbit 3000 Microprocessor - Kamal Hyder 2004-11-29
The Rabbit 3000 is a popular high-performance microprocessor specifically designed for embedded control, communications, and Ethernet connectivity. This new technical reference book will help designers get the most out of the Rabbit's powerful feature set. The first book on the market to focus exclusively on the Rabbit 3000, it provides detailed coverage of: Rabbit architecture and development environment, interfacing to the external world, networking, Rabbit assembly language, multitasking, debugging, Dynamic C and much more! Authors Kamal Hyder and Bob Perrin are embedded engineers with years of experience and they offer a wealth of design details and "insider" tips and techniques. Extensive embedded design examples are supported by fully tested source code. Whether you're already working with the Rabbit or considering it for a future design, this is one reference you can't be without! Let the experts teach you how to design embedded systems that efficiently hook up to the Internet using networked core modules Provides a number of projects and source code using RabbitCore, which will make it easy for the system designer and programmer to get hands-on experience developing networked devices

Algorithms and Architectures for Real-Time Control 1992 - P.J. Fleming 2014-05-23
This Workshop focuses on such issues as control algorithms which are suitable for real-time use, computer architectures which are suitable for real-time control algorithms, and applications for real-time control issues in the areas of parallel algorithms, multiprocessor systems, neural networks, fault-tolerance systems, real-time robot control identification, real-time filtering algorithms, control algorithms, fuzzy control, adaptive and self-tuning control, and real-time control applications.

Field Programmable Logic and Application - Jürgen Becker 2004-08-19
This book constitutes the refereed proceedings of the 13th International Conference on Field-Programmable Logic and Applications, FPL 2003, held in Lisbon, Portugal in September 2003. The 90 revised full papers and 56 revised poster papers presented were carefully reviewed and selected from 216 submissions. The papers are organized in topical sections on technologies and trends, communications applications, high level design tools, reconfigurable architecture, cryptographic applications, multi-context FPGAs, low-power issues, run-time reconfiguration, compilation tools, asynchronous techniques, bio-related applications, codesign, reconfigurable fabrics, image processing applications, SAT techniques, application-specific architectures, DSP applications, dynamic reconfiguration, SoC architectures, emulation, cache design, arithmetic, bio-inspired design, SoC design, cellular applications, fault analysis, and network applications.

Vector and Parallel Processing - VECPAR'98 - Jack Dongarra 1999-06-29
This book constitutes the thoroughly refereed post-conference proceedings of the Third International Conference on Vector and Parallel Processing, VECPAR'98, held in Porto, Portugal, in June 1998. The 41 revised full papers presented were carefully selected during two rounds of reviewing and revision. Also included are six invited papers and introductory chapter surveys. The papers are organized in sections on eigenvalue problems and solutions of linear systems; computational fluid dynamics, structural analysis, and mesh partitioning; computing in education; computer organization, programming and benchmarking; image analysis and synthesis; parallel database servers; and nonlinear problems.

Advances in Neuro-Information Processing - Mario Köppen 2009-07-30
The two volume set LNCS 5506 and LNCS 5507 constitutes the thoroughly refereed post-conference proceedings of the 15th International Conference on Neural Information Processing, ICONIP 2008, held in Auckland, New Zealand, in November 2008. The 260 revised full papers presented were carefully reviewed and selected from numerous ordinary paper submissions and 15 special organized sessions. 116 papers are

published in the first volume and 112 in the second volume. The contributions deal with topics in the areas of data mining methods for cybersecurity, computational models and their applications to machine learning and pattern recognition, lifelong incremental learning for intelligent systems, application of intelligent methods in ecological informatics, pattern recognition from real-world information by svm and other sophisticated techniques, dynamics of neural networks, recent advances in brain-inspired technologies for robotics, neural information processing in cooperative multi-robot systems.

Closing the Loop Around Neural Systems - Steve M Potter 2014-12-03

Closed-loop neurophysiology has been accelerated by recent software and hardware developments and by the emergence of novel tools to control neuronal activity with spatial and temporal precision, in which stimuli are delivered in real time based on recordings or behavior. Real-time stimulation feedback enables a wide range of innovative studies of information processing and plasticity in neuronal networks. This Research Topic e-Book comprises 16 Original Research Articles, seven Methods Articles, and seven Reviews, Mini- Reviews, and Perspectives, all peer-reviewed and published in Frontiers in Neural Circuits. The contributions deal with closed loop neurophysiology experiments at a variety of levels of neural circuit complexity. Some include modeling and theoretical analyses. New enabling technologies and techniques are described. Novel work is presented from experiments in vitro, in vivo, and in humans, along with their clinical and technological implications for improving the human condition.

Proceedings of IncoME-VI and TEPEN 2021 - Hao Zhang 2022-09-17

This volume gathers the latest advances, innovations and applications in the field of condition monitoring, plant maintenance and reliability, as presented by leading international researchers and engineers at the 6th International Conference on Maintenance Engineering and the 2021 conference of the Efficiency and Performance Engineering Network (IncoME-VI TEPEN 2021), held in Tianjin, China on October 20-23, 2021. Topics include vibro-acoustics monitoring, condition-based maintenance, sensing and instrumentation, machine health monitoring, maintenance auditing and organization, non-destructive testing, reliability, asset management, condition monitoring, life-cycle cost optimisation, prognostics and health management, maintenance performance measurement, manufacturing process monitoring, and robot-based monitoring and diagnostics. The contributions, which were selected through a rigorous international peer-review process, share exciting ideas that will spur novel research directions and foster new multidisciplinary collaborations.

VLSI-SOC: From Systems to Chips - Manfred Glesner 2006-05-17

This monograph, divided into four parts, presents a comprehensive treatment and systematic examination of cycle spaces of flag domains. Assuming only a basic familiarity with the concepts of Lie theory and geometry, this work presents a complete structure theory for these cycle spaces, as well as their applications to harmonic analysis and algebraic geometry. Key features include: accessible to readers from a wide range of fields, with all the necessary background material provided for the nonspecialist; many new results presented for the first time; driven by numerous examples; the exposition is presented from the complex geometric viewpoint, but the methods, applications and much of the motivation also come from real and complex algebraic groups and their representations, as well as other areas of geometry; comparisons with classical Barlet cycle spaces are given; and good bibliography and index. Researchers and graduate students in differential geometry, complex analysis, harmonic analysis, representation theory, transformation groups, algebraic geometry, and areas of global geometric analysis will benefit from this work.

High Performance Computing in Power and Energy Systems - Siddhartha Kumar Khaitan 2012-09-13

The twin challenge of meeting global energy demands in the face of growing economies and populations and restricting greenhouse gas emissions is one of the most daunting ones that humanity has ever faced. Smart electrical generation and distribution infrastructure will play a crucial role in meeting these challenges. We would need to develop capabilities to handle large volumes of data generated by the power system components like PMUs, DFRs and other data acquisition devices as well as by the capacity to process these data at high resolution via multi-scale and multi-period simulations, cascading and security analysis, interaction between hybrid systems (electric, transport, gas, oil, coal, etc.) and so on, to get meaningful information in real time to ensure a secure, reliable and stable power system grid. Advanced

research on development and implementation of market-ready leading-edge high-speed enabling technologies and algorithms for solving real-time, dynamic, resource-critical problems will be required for dynamic security analysis targeted towards successful implementation of Smart Grid initiatives. This books aims to bring together some of the latest research developments as well as thoughts on the future research directions of the high performance computing applications in electric power systems planning, operations, security, markets, and grid integration of alternate sources of energy, etc.

Power-Aware Computer Systems - Babak Falsafi 2005-12-24

Welcome to the proceedings of the Power-Aware Computer Systems (PACS 2004) workshop held in conjunction with the 37th Annual International Sym- sium on Microarchitecture (MICRO-37). The continued increase of power and energy dissipation in computer systems has resulted in higher cost, lower re- ability, and reduced battery life in portable systems. Consequently, power and energy have become ?rst-class constraints at all layers of modern computer s- tems. PACS 2004 is the fourth workshop in its series to explore techniques to reduce power and energy at all levels of computer systems and brings together academic and industry researchers. The papers in these proceedings span a wide spectrum of areas in pow- aware systems. We have grouped the papers into the following categories: (1) microarchitecture- and circuit-level techniques, (2) power-aware memory and interconnect systems, and (3) frequency- and voltage-scaling techniques. The ?rst paper in the microarchitecture group proposes banking and wri- back ?ltering to reduce register ?le power. The second paper in this group - timizes both delay and power of the issue queue by packing two instructions in each issue queue entry and by memorizing upper-order bits of the wake-up tag. The third paper proposes bit slicing the datapath to exploit narrow width operations, and the last paper proposes to migrate application threads from one core to another in a multi-core chip to address thermal problems.

Field-Programmable Logic and Applications: The Roadmap to Reconfigurable Computing - Reiner W. Hartenstein 2003-06-29

This book is the proceedings volume of the 10th International Conference on Field Programmable Logic and its Applications (FPL), held August 27 30, 2000 in Villach, Austria, which covered areas like reconfigurable logic (RL), reconfigurable computing (RC), and its applications, and all other aspects. Its subtitle "The Roadmap to Reconfigurable Computing" reminds us, that we are currently witnessing the runaway of a breakthrough. The annual FPL series is the eldest international conference in the world covering configware and all its aspects. It was founded 1991 at Oxford University (UK) and is 2 years older than its two most important competitors usually taking place at Monterey and Napa. FPL has been held at Oxford, Vienna, Prague, Darmstadt, London, Tallinn, and Glasgow (also see: http://www. fpl. uni kl. de/FPL/). The New Case for Reconfigurable Platforms: Converging Media. Indicated by palmtops, smart mobile phones, many other portables, and consumer electronics, media such as voice, sound, video, TV, wireless, cable, telephone, and Internet continue to converge. This creates new opportunities and even necessities for reconfigurable platform usage. The new converged media require high volume, flexible, multi purpose, multi standard, low power products adaptable to support evolving standards, emerging new standards, field upgrades, bug fixes, and, to meet the needs of a growing number of different kinds of services offered to zillions of individual subscribers preferring different media mixes.

Dynamic Reconfigurable Network-on-Chip Design: Innovations for Computational Processing and Communication - Shen, Jih-Sheng 2010-06-30

Reconfigurable computing brings immense flexibility to on-chip processing while network-on-chip has improved flexibility in on-chip communication. Integrating these two areas of research reaps the benefits of both and represents the promising future of multiprocessor systems-on-chip. This book is the one of the first compilations written to demonstrate this future for network-on-chip design. Through dynamic and creative research into questions ranging from integrating reconfigurable computing techniques, to task assigning, scheduling and arrival, to designing an operating system to take advantage of the computing and communication flexibilities brought about by run-time reconfiguration and network-on-chip, it represents a complete source of the techniques and applications for reconfigurable network-on-chip necessary for understanding of future of this field.

Applications of Model Predictive Control to Vehicle Dynamics for Active Safety and Stability - Craig Earl

Beal 2011

Each year in the United States, thousands of lives are lost as a result of loss of control crashes. Production driver assistance systems such as electronic stability control (ESC) have been shown to be highly effective in preventing many of these automotive crashes, yet these systems rely on a sensor suite that yields limited information about the road conditions and vehicle motion. Furthermore, ESC systems rely on gains and thresholds that are tuned to yield good performance without feeling overly restrictive to the driver. This dissertation presents an alternative approach to providing stabilization assistance to the driver which leverages additional information about the vehicle and road that may be obtained with advanced estimation techniques. This new approach is based on well-known and robust vehicle models and utilizes phase plane analysis techniques to describe the limits of stable vehicle handling, alleviating the need for hand tuning of gains and thresholds. The resulting state space within the computed handling boundaries is referred to as a safe handling envelope. In addition to the boundaries being straightforward to calculate, this approach has the benefit of offering a way for the designer of the system to directly adjust the controller to accomodate the preferences of different drivers. A model predictive control structure capable of keeping the vehicle within the safe handling boundaries is the final component of the envelope control system. This dissertation presents the design of a controller that is capable of smoothly and progressively augmenting the driver steering input to enforce the boundaries of the envelope. The model predictive control formulation provides a method for making trade-offs between enforcing the boundaries of the envelope, minimizing disruptive interventions, and tracking the driver's intended trajectory. Experiments with a steer-by-wire test vehicle demonstrate that the model predictive envelope control system is capable of operating in conjunction with a human driver to prevent loss of control of the vehicle while yielding a predictable vehicle trajectory. These experiments considered both the ideal case of state information from a GPS/INS system and an a priori friction estimate as well as a real-world implementation estimating the vehicle states and friction coefficient from steering effort and inertial sensors. Results from the experiments demonstrated a controller that is tolerant of vehicle and tire parameterization errors and works well over a wide range of conditions. When real time sensing of the states and friction properties is enabled, the results show that coupling of the controller and estimator is possible and the model predictive control structure provides a mechanism for minimizing undesirable coupled dynamics through tuning of intuitive controller parameters. The model predictive control structure presented in this dissertation may also be considered as a general framework for vehicle control in conjunction with a human driver. The structure utilized for envelope control may also be used to restrict other vehicle states for safety and stability. Results are presented in this dissertation to show that a model predictive controller can coordinate a secondary actuator to alter the planar states and reduce the energy transferred into the roll modes of the vehicle. The systematic approach to vehicle stabilization presented in this dissertation has the potential to improve the design methodology for future systems and form the basis for the inclusion of more advanced functions as sensing and computing capabilities improve. The envelope control system presented here offers the opportunity to advance the state of the art in stabilization assistance and provides a way to help drivers of all skill levels maintain control of their vehicle.

Grid and Cloud Computing: Concepts, Methodologies, Tools and Applications - Management Association, Information Resources 2012-04-30
"This reference presents a vital compendium of research detailing the latest case studies, architectures, frameworks, methodologies, and research on Grid and Cloud Computing"--
Journal of Dynamic Systems, Measurement, and Control - 2003

Dynamic-Clamp - Alain Destexhe 2009-03-11
Dynamic-clamp is a fascinating electrophysiology technique that consists of merging living neurons with computational models. The dynamic-clamp (also called "conductance injection") allows experimentalists and theoreticians to challenge neurons (or any other type of cell) with complex conductance stimuli generated by a computer. The technique can be implemented from neural simulation environments and a variety of custom-made or commercial systems. The real-time interaction between the computer and cell also enables the design of recording paradigms with unprecedented accuracy via a computational model of the electrode. Dynamic-Clamp: From Principles to Applications contains contributions from leading researchers in the field, who investigate these paradigms at the cellular or network level, in vivo and in vitro, and in different brain regions and cardiac cells. Topics discussed include the addition of artificially-generated synaptic activity to neurons; adding, amplifying or neutralizing voltage-dependent conductances; creating hybrid networks with real and artificial cells; attaching simulated dendritic tree structures to the living cell; and connecting different neurons. This book will be of interest to experimental biophysicists, neurophysiologists, and cardiac physiologists, as well as theoreticians, engineers, and computational neuroscientists. Graduate and undergraduate students will also find up-to-date coverage of physiological problems and how they are investigated.

Trends in Advanced Intelligent Control, Optimization and Automation - Wojciech Mitkowski 2017-06-06
This volume contains the proceedings of the KKA 2017 – the 19th Polish Control Conference, organized by the Department of Automatics and Biomedical Engineering, AGH University of Science and Technology in Kraków, Poland on June 18–21, 2017, under the auspices of the Committee on Automatic Control and Robotics of the Polish Academy of Sciences, and the Commission for Engineering Sciences of the Polish Academy of Arts and Sciences. Part 1 deals with general issues of modeling and control, notably flow modeling and control, sliding mode, predictive, dual, etc. control. In turn, Part 2 focuses on optimization, estimation and prediction for control. Part 3 is concerned with autonomous vehicles, while Part 4 addresses applications. Part 5 discusses computer methods in control, and Part 6 examines fractional order calculus in the modeling and control of dynamic systems. Part 7 focuses on modern robotics. Part 8 deals with modeling and identification, while Part 9 deals with problems related to security, fault detection and diagnostics. Part 10 explores intelligent systems in automatic control, and Part 11 discusses the use of control tools and techniques in biomedical engineering. Lastly, Part 12 considers engineering education and teaching with regard to automatic control and robotics.

Transactions on Computational Collective Intelligence X - Ngoc-Thanh Nguyen 2013-05-20
These transactions publish research in computer-based methods of computational collective intelligence (CCI) and their applications in a wide range of fields such as the Semantic Web, social networks, and multi-agent systems. TCCI strives to cover new methodological, theoretical and practical aspects of CCI understood as the form of intelligence that emerges from the collaboration and competition of many individuals (artificial and/or natural). The application of multiple computational intelligence technologies, such as fuzzy systems, evolutionary computation, neural systems, consensus theory, etc., aims to support human and other collective intelligence and to create new forms of CCI in natural and/or artificial systems. This tenth issue contains 13 carefully selected and thoroughly revised contributions.

Energy Research Abstracts - 1992

The VLSI Handbook - Wai-Kai Chen 2018-10-03
For the new millenium, Wai-Kai Chen introduced a monumental reference for the design, analysis, and prediction of VLSI circuits: The VLSI Handbook. Still a valuable tool for dealing with the most dynamic field in engineering, this second edition includes 13 sections comprising nearly 100 chapters focused on the key concepts, models, and equations. Written by a stellar international panel of expert contributors, this handbook is a reliable, comprehensive resource for real answers to practical problems. It emphasizes fundamental theory underlying professional applications and also reflects key areas of industrial and research focus. WHAT'S IN THE SECOND EDITION? Sections on... Low-power electronics and design VLSI signal processing Chapters on... CMOS fabrication Content-addressable memory Compound semiconductor RF circuits High-speed circuit design principles SiGe HBT technology Bipolar junction transistor amplifiers Performance modeling and analysis using SystemC Design languages, expanded from two chapters to twelve Testing of digital systems Structured for convenient navigation and loaded with practical solutions, The VLSI Handbook, Second Edition remains the first choice for answers to the problems and challenges faced daily in engineering practice.

Visual Servoing -

Dynamics and Control of Switched Electronic Systems - Francesco Vasca 2012-03-28

The increased efficiency and quality constraints imposed on electrical energy systems have inspired a renewed research interest in the study of formal approaches to the analysis and control of power electronics converters. Switched systems represent a useful framework for modeling these converters and the peculiarities of their operating conditions and control goals justify the specific classification of "switched electronic systems". Indeed, idealized switched models of power converters introduce problems not commonly encountered when analyzing generic switched models or non-switched electrical networks. In that sense the analysis of switched electronic systems represents a source for new ideas and benchmarks for switched and hybrid systems generally. Dynamics and Control of Switched Electronic Systems draws on the expertise of an international group of expert contributors to give an overview of recent advances in the modeling, simulation and control of switched electronic systems. The reader is provided with a well-organized source of references and a mathematically-based report of the state of the art in analysis and design techniques for switched power converters. Intuitive language, realistic illustrative examples and numerical simulations help the reader to come to grips with the rigorous presentation of many promising directions of research such as: converter topologies and modulation techniques; continuous-time, discrete-time and hybrid models; modern control strategies for power converters; and challenges in numerical simulation. The guidance and information imparted in this text will be appreciated by engineers, and applied mathematicians working on system and circuit theory, control systems development, and electronic and energy conversion systems design.

Neuromorphic Engineering Systems and Applications - André van Schaik 2015-07-05
Neuromorphic engineering has just reached its 25th year as a discipline. In the first two decades neuromorphic engineers focused on building models of sensors, such as silicon cochleas and retinas, and building blocks such as silicon neurons and synapses. These designs have honed our skills in implementing sensors and neural networks in VLSI using analog and mixed mode circuits. Over the last decade the address event representation has been used to interface devices and computers from different designers and even different groups. This facility has been essential for our ability to combine sensors, neural networks, and actuators into neuromorphic systems. More recently, several big projects have emerged to build very large scale neuromorphic systems. The Telluride Neuromorphic Engineering Workshop (since 1994) and the CapoCaccia Cognitive Neuromorphic Engineering Workshop (since 2009) have been instrumental not only in creating a strongly connected research community, but also in introducing different groups to each other's hardware. Many neuromorphic systems are first created at one of these workshops. With this special research topic, we showcase the state-of-the-art in neuromorphic systems.

Underwater Acoustics and Ocean Dynamics - Lisheng Zhou 2016-10-17
These proceedings are a collection of 16 selected scientific papers and reviews by distinguished international experts that were presented at the 4th Pacific Rim Underwater Acoustics Conference (PRUAC), held in Hangzhou, China in October 2013. The topics discussed at the conference include internal wave observation and prediction; environmental uncertainty and coupling to sound propagation; environmental noise and ocean dynamics; dynamic modeling in acoustic fields; acoustic tomography and ocean parameter estimation; time reversal and matched field processing; underwater acoustic localization and communication as well as measurement instrumentations and platforms. These proceedings provide insights into the latest developments in underwater acoustics, promoting the exchange of ideas for the benefit of future research.

Algorithms and Architectures for Real-Time Control 1991 - P.J. Fleming 2014-07-22
Computer scientists have long appreciated that the relationship between algorithms and architecture is crucial. Broadly speaking the more specialized the architecture is to a particular algorithm then the more efficient will be the computation. The penalty is that the architecture will become useless for computing anything other than that algorithm. This message holds for the algorithms used in real-time automatic control as much as any other field. These Proceedings will provide researchers in this field with a useful up-to-date reference source of recent developments.

Energy Efficient Hardware-Software Co-Synthesis Using Reconfigurable Hardware - Jingzhao Ou 2009-10-14
Rapid energy estimation for energy efficient applications using field-programmable gate arrays (FPGAs) remains a challenging research topic. Energy dissipation and efficiency have prevented the widespread use of FPGA devices in embedded systems, where energy efficiency is a key performance metric. Helping overcome these challenges, Energy Efficient Hardware-Software Co-Synthesis Using Reconfigurable Hardware offers solutions for the development of energy efficient applications using FPGAs. The book integrates various high-level abstractions for describing hardware and software platforms into a single, consistent application development framework, enabling users to construct, simulate, and debug systems. Based on these high-level concepts, it proposes an energy performance modeling technique to capture the energy dissipation behavior of both the reconfigurable hardware platform and the target applications running on it. The authors also present a dynamic programming-based algorithm to optimize the energy performance of an application running on a reconfigurable hardware platform. They then discuss an instruction-level energy estimation technique and a domain-specific modeling technique to provide rapid and fairly accurate energy estimation for hardware-software co-designs using reconfigurable hardware. The text concludes with example designs and illustrative examples that show how the proposed co-synthesis techniques lead to a significant amount of energy reduction. This book explores the advantages of using reconfigurable hardware for application development and looks ahead to future research directions in the field. It outlines the range of aspects and steps that lead to an energy efficient hardware-software application synthesis using FPGAs.