Nonlinear H2/H-Infinity Constrained Feedback Control
A Practical Design Approach Using Neural Networks

The authors present algorithms for H2 and H-infinity design for nonlinear systems which provide solution techniques which can be implemented in real systems; neural networks are used to solve the nonlinear control design equations. Constraints on the control actuator inputs are dealt with. Results are proven to give confidence and performance guarantees. The algorithms can be used to obtain practical controllers. Nearly optimal applications to constrained-state and minimum-time problems are discussed as is discrete-time design for digital controllers.

Features
► Provides the reader with techniques that will produce robust, stable and usable solutions to problems of H-infinity and H2 control in high-performance, non-linear systems for the first time
► Shows the reader how to deal with actuator-constrained systems in the real world

From the contents

Field of interest
Control Engineering

Target groups
Control systems designers working with industrial, automotive, robotic, military, aerospace and chemical process systems; graduate students working in control systems in Departments of Electrical, Mechanical, Biological, Civil, Chemical and Electronic and Computer Engineering; libraries; academics working in control systems in Departments of Electrical, Mechanical, Biological, Civil, Chemical and Electronic and Computer Engineering; libraries

Discount group
P

Digital Phase Lock Loops
Architectures and Applications

Digital phase locked loops are critical components of many communication, signal processing and control systems. This exciting new book covers various types of digital phase lock loops. It presents a comprehensive coverage of a new class of digital phase lock loops called the time delay tanlock loop (TDTL). It also details a number of architectures that improve the performance of the TDTL through adaptive techniques that overcome the conflicting requirements of the locking range and speed of acquisition. These requirements are of paramount importance in many applications including wireless communications, consumer electronics and others. Digital Phase Lock Loops then illustrates the process of converting the TDTL class of digital phase lock loops for implementation on an FPGA-based reconfigurable system. These devices are being utilized in software-defined radio, DSP-based designs and many other communication and electronic systems to implement complex high-speed algorithms. Their flexibility and reconfigurability facilitate rapid prototyping, on-the-fly upgradability, and code reuse with minimum effort and complexity. The practical real-time results, of the various TDTL architectures, obtained from the reconfigurable implementations are compared with those obtained through simulations with MATLAB/Simulink. The material in this book will be valuable to researchers, graduate students, and practicing engineers.

Features
► A wide coverage of digital phase lock loops including a new class called TDTL
► Theoretical and practical aspects of digital phase lock loops
► FPGA-based reconfigurable implementation of digital phase lock loop architectures
► Selected applications of digital phase lock loops

Field of interest
Circuits and Systems

Target groups
Researchers, graduate students and practicing engineers involved in the design of digital communication systems, digital control systems and instrumentation, FPGA-based embedded systems

Discount group
P

Environment Learning for Indoor Mobile Robots
A Stochastic State Estimation Approach to Simultaneous Localization and Map Building

This monograph covers theoretical aspects of simultaneous localization and map building for mobile robots, such as estimation stability, nonlinear models for the propagation of uncertainties, temporal landmark compatibility, as well as issues pertaining the coupling of control and SLAM. One of the most relevant topics covered in this monograph is the theoretical formalism of partial observability in SLAM. The authors show that the typical approach to SLAM using a Kalman filter results in marginal filter stability, making the final reconstruction estimates dependant on the initial vehicle estimates. However, by anchoring the map to a fixed landmark in the scene, they are able to attain full observability in SLAM, with reduced covariance estimates. This result earned the first author the EURON Georges Giralt Best PhD Award in its fourth edition, and has prompted the SLAM community to think in new ways to approach the mapping problem. For example, by creating local maps anchored on a landmark, or on the robot initial estimate itself, and then using geometric relations to fuse local maps globally. This monograph is appropriate as a text for an introductory estimation-theoretic approach to the SLAM problem, and as a reference book for people who work in mobile robotics research in general.

Contents

Field of interest
Automation and Robotics

Target groups
Researchers, engineers, graduate students in Robotics and Computer Vision

Discount group
P
Networked Embedded Sensing and Control
Workshop NESC’05:
University of Notre Dame, USA
October 2005 Proceedings

Recent technological developments in sensing, communications, control and computation have created an emerging class of complex systems hereon called networked embedded systems. These systems can be roughly described as collections of spatially distributed sensors, actuators and controllers whose behaviour is coordinated through wired or wireless communication links. This integration between different technologies and scientific domains presents new and challenging fundamental problems underlying the theoretical foundations for this class of systems. This workshop aims at bringing together researchers working of different aspects of networked embedded systems in order to exchange research experiences and to identify the main scientific challenges in this exciting new area.

Features
► Contains the proceedings of the Workshop on Networked Embedded Sensing and Control

Contents
Part I Multi-Agent Control.- Part II Simulation and Implementation.- Part III Distributed Sensing, Filtering and Estimation.- Part IV Control over Networks I.- Part V Control over Networks II.

Field of interest
Control Engineering

Target groups
Engineers, researchers and students in Control Engineering, Robotics, Mechatronics

Discount group
P

Switched Finite Time Control of a Class of Underactuated Systems

The control of mechanical systems with constraints has been a topic of intense research in the control and dynamical systems community for the past two decades. In particular, systems with velocity and/or acceleration level constraints which appear in many applications like - robotics, spacecrafts, launch vehicles, underwater vehicles - have been studied intensively. This monograph is a self-contained exposition on a switched, finite-time, control strategy for this class of systems. Beginning with basic definitions and mathematical preliminaries, the monograph works its way up to the main control algorithm. Three well-studied applications are chosen to demonstrate the algorithm. Other facets of the algorithm and an alternate algorithm are also briefly touched upon. The monograph is intended for graduate students and researchers in the area of nonlinear control and dynamical systems.

Features
► Presents a switched finite time control philosophy to stabilize a class of underactuated systems

Contents
Mathematical preliminaries.- A switched finite-time controller design methodology.- Alternative control strategies for the NL.- Switched stabilization of a hovercraft.- Output feedback stabilization of a mobile robot.

Field of interest
Control Engineering

Target groups
Engineers, researchers, and students in Control Engineering

Discount group
P

Practical Grey-box Process Identification
Theory and Applications

In process modelling, knowledge of the process under consideration is typically partial with significant disturbances to the model. Disturbances militate against the desirable trait of model reproducibility. “Grey-box” identification takes advantage of two sources of process information that may be available: any invariant prior knowledge and response data from experiments. “Practical Grey-box Process Identification” is in three parts: The first part is a short review of the theoretical fundamentals of grey-box identification, focussing particularly on the theory necessary for the software presented in the second part. Part II puts the spotlight on MoCaVa, a MATLAB®-compatible software tool, downloadable from springeronline.com, for facilitating the procedure of effective grey-box identification. Part III demonstrates the application of MoCaVa using two case studies drawn from the paper and steel industries. More advanced theory is laid out in an appendix and the MoCaVa source code enables readers to expand on its capabilities to their own ends.

Features
► MoCaVa, MATLAB®-compatible software takes the reader through the whole process of grey-box identification maintaining reliability of methods and the resulting process models ► Answers common questions about which data will help in building accurate models for systems with unknown inputs and shows the reader how to take maximum advantage of any data that are available

System requirements
For PC. For the complete system requirements see: springeronline.com

Field of interest
Control Engineering

Target groups
Researchers and tutors in process control and identification in chemical engineering and electronic and computer engineering; industrial engineers working with control systems based on incomplete process and system data; libraries

Discount group
P
Since nanotechnology is considered key for the 21st century, its promises have been assessed by various scientific communities. By meeting at the nanoscale, various disciplines, from physics via chemistry to biology, from engineering to medicine contribute synergetically to the newly created knowledge base and the resulting technological advances. Considering that large societal sectors will be impacted, the unique aspect of our 2-year study was to assess nanotechnology from various interrelated perspectives: scientific progress, industrial relevance, economic potential, educational needs, potential adverse health effects, and philosophical aspects.

The goal of this study was to derive integrated recommendations which consider the large range of societal implications reflecting the different views in an integrative manner. The study attempts to link previously isolated statements, bundling the various concepts and giving unified recommendations to decision makers in relevant society sectors as politics, economy and research. Special attention was given to the European situation with respect to commercial consequences, an aspect that turned out to have serious consequences.

**European Robotics Symposium 2006**

This unique reference represents a cross-section of forefront robotics research, ranging from robotics and systems to learning, autonomy and failure detection, from vision and navigation to localization and mapping, which are based on the papers presented at the 1st European Robotics Symposium (EUROS-06) held in Palermo, Italy from 16-18 March, 2006. The European Robotics Symposium (EUROS) is a brand-new International scientific event promoted by EURON, the European Robotics Network. Since its inception in 2000, EURON links most of the European robotics research teams and today (2006) involves more than 165 universities and companies across all of its member states. The EUROS meeting will be held in Europe every other year, but international participation at all levels is strongly encouraged making it a meeting place for high-quality presentation of interesting international research on robotics.

**Features**

- Presents the latest in European Robotics

**From the contents**


**Field of interest**

Automation and Robotics

**Target groups**

Researchers, graduate students and professionals in Robotics

**Discount group**

P

**Distributed Cooperative Laboratories**

Networking, Instrumentation, and Measurements

Distributed Cooperative Laboratories: Networking, Instrumentation, and Measurements is devoted to the investigation of the main issues related to the sustainable realization of tele-laboratories, where real and virtual instrumentation can be shared and used in a collaborative environment. This is a highly interdisciplinary topic, where various aspects converge: multimedia communications and networking, sensor networks, Grid technology, Quality of Service (QoS) provisioning and control, network management, measurement instrumentation and methodology, architecture of measurement systems. The book contains peer reviewed chapters organized into six parts: Technologies for Real-Time Interactive Multimedia Communications; Monitoring, Management and Configuration of Networks and Networking Devices; Data Acquisition and Aggregation in Sensor Networks; Grid Structures for Distributed Cooperative Laboratories; Architectures and Techniques for Tele-Measurements; and Virtual Immersive Communications and Distance Learning. Each chapter presents a self-contained treatment, within a framework that provides the reader with an up-to-date picture of the state-of-the-art and of the most recent developments of this multi-faceted topic.

**Features**

- Investigates the compelling issues surrounding the sustainable realization of tele-laboratories
- Discusses the implementation of shared real and virtual tools and instrumentation
- Includes the convergence of many different technological aspects which makes the book a truly interdisciplinary text

**Field of interest**

Communications Engineering, Networks

**Target groups**

Libraries and researchers in digital communication

**Discount group**

P
Error Analysis and Practical Design

The book starts with a tutorial presentation of the fundamentals of low-pass sigma-delta modulators, their applications, and their most common architectures. It then presents an exhaustive analysis of SC circuit errors with a twofold outcome. On the one hand, compact expressions are derived to support design plans and quick top-down design. On the other, detailed behavioral models are presented to support accurate verification. This set of models allows the designer to determine the required specifications for the different modulator building blocks and form the basis of a systematic design approach. The book is completed in subsequent chapters with the detailed presentation of three high-performance modulator ICs: the first two are intended for DSL-like applications, whereas the third one is intended for automotive sensors.

CMOS Cascade Sigma-Delta Modulators for Sensors and Telecom: Error Analysis and Practical Design contains highly valuable information that is structured to give the reader the necessary insight on how to design SC sigma-delta modulators.

Features

► Tutorial presentation of the fundamentals of low-pass sigma-delta (SD) converters, their main applications and their most common architectures
► Detailed and in-depth analysis of switched-capacitor (SC) errors from the building-block level to the modulator level, with a triple purpose ► To provide procedures to map modulator specifications onto design parameters ► To obtain compact expressions for fast estimation of the error influence on the modulator performance ► To obtain accurate models that can be incorporated in time-domain behavioral simulation tools

Field of interest
Circuits and Systems

Target groups
Mixed-signal designers, non-experienced graduate students in the field of Microelectronics, can also be used in undergraduate courses

Discount group
P

Due June 2006
ISBN 1-4020-4775-4 ► $125.00

Due May 2006
ISBN 1-4020-4578-6 ► $159.00

Due July 2006
2006. Approx. 500 p. Also available online. (Lecture Notes in Control and Information Sciences, Volume 334) Softcover
ISBN 3-540-32800-9 ► $159.00

Bonding in Microsystem Technology

Bonding in Microsystem Technology starts with descriptions of terminology, kinds of microsystems and market analysis. Followed by the presentation of mechanisms of wet etching, set of process parameters, description of micromachining methods, examples of procedures, process flow-charts and applications of basic micromechanical structures in microsystems are shown. Next, high-temperature, low temperature and room-temperature bonding and their applications in microsystem technology are presented. The following part of the book contains the detailed description of anodic bonding, starting from analysis of properties of glasses suitable for anodic bonding, and discussion of the nature of the process. Next all types of anodic bonding and sealing procedures used in microsystem technology are presented. This part of the book finishes with examples of applications of anodic bonding in microsystem technology taken from the literature but mainly based on the author’s personal experience.

Features

► The first compendium on silicon/glass microsystems made by deep wet etching and the first book with a detailed description of bonding techniques used in microsystem technology
► Detailed description and working receipts (know-how) of KOH etching and anodic bonding of silicon and borosilicate glass ► Several examples of microsystem fabrication procedures, process lay-out, discussion of “technological kitchen” based on author’s own laboratory experience, rich literature data

Field of interest
Continuum Mechanics and Mechanics of Materials

Target groups
Scientists, researchers and process engineers in microsystem technology /micromechanics/microelectronics; academic teachers and students of Electronics/Microelectronics/Microsystem Faculties; Departments Academic staff and students of Mechanical and Chemical Faculties/Departments interested in micro-engineering and/or in chemical microsystems (microtas’s)

Discount group
P

Advances in Variable Structure and Sliding Mode Control

Sliding Mode Control is recognized as an efficient tool to design controllers which are robust with respect to uncertainty. The resulting controllers have low sensitivity to plant parameters and perturbations and allow the possibility of decoupling the original plant system into two components of lower dimension. In addition many controllers ensure finite time convergence to the switching surface and can be straightforwardly implemented. However, in addition to this traditional area of exploitation, sliding mode concepts are being increasingly deployed for the design of observers for estimation and identification. Many of the chapters in this book are based on expansions of selected presentations from the 8th IEEE International Workshop on Variable Structure Systems VSS’04, which was held in Barcelona, Spain in September 2004. The editors have tried to identify the key contributions from this workshop, which define the state-of-the-art, represent new directions building on existing work, and highlight new emerging application areas.

Features

► Defines the state of the art, of variable structure systems, represents new directions building on existing work, and highlights new emerging application areas ► Based on selected presentations from the 8th IEEE International Workshop on Variable Structure Systems VSS’04, which was held in Barcelona, Spain in September 2004

From the contents

Field of interest
Control Engineering

Target groups
Engineers, researchers, and students in Control Engineering

Discount group
P
Gene Expression Programming
Mathematical Modeling by an Artificial Intelligence

C. Ferreira, Gepssoft Ltd., Bristol, UK

This book is aiming to concentrate on the nonlinear static and dynamic analysis of structures and structural components that are widely used in everyday engineering applications. It approaches a nonlinear problem by mathematically converting it into an exact equivalent pseudolinear one, in contrast to commonly used approaches which are based on linear concepts. The new concepts, theories and methods introduced in this book, simplify the solution of the complex nonlinear problems, and also allow for the correct usage of the powerful existing linear methods of analysis. Based on this way of thinking, the book also provides a reasonable treatment regarding the nonlinear analysis of inelastic plates, suspension bridges and their failures, multistory buildings subjected to strong earthquakes, as well as many other interesting nonlinear problems, such as thick cylinders, inelastic torsion, inelastic vibrations, inelastic analysis of flexible members, and many more.

Features
► Presents unique methods for nonlinear problems which permits the correct usage of powerful linear methods — in contrast to commonly used methods ► Every topic is thoroughly explained and includes numerical examples; every chapter is provided with problems for practice and answer of many of those are supplied

Contents

Field of interest
Structural Mechanics

Target groups
Advanced Students, practitioners, researchers in solid mechanics, civil and aeronautical engineering

Discount group
P

Nonlinear Structural Engineering
With Unique Theories and Methods to Solve Effectively Complex Nonlinear Problems

D. G. Fertis, University of Akron, OH, USA

Cooperation in Wireless Networks: Principles and Applications
Real egocentric behavior is to cooperate!

F. H. Fitzek, Aalborg University, Denmark; M. Katz, Samsung Electronics Co. Ltd., Korea (Eds.)

Cooperation in Wireless Networks: Principles and Applications covers the underlying principles of cooperative techniques as well as several applications demonstrating the use of such techniques in practical systems. The work is written in a collaborative manner by several authors from Asia, America, and Europe. Twenty chapters introduce and discuss in detail the main cooperative strategies for the whole communication protocol stack from the application layer down to the physical layer. Furthermore power saving strategies, security, hardware realization, and user scenarios for cooperative communication systems are introduced and discussed. The book also summarizes the strength of cooperation for upcoming generation of wireless communication systems, clearly motivating the use of cooperative techniques and pointing out that cooperation will become one of the key technologies enabling 4G and beyond. This book puts into one volume a comprehensive and technically rich view of the wireless communications scene from a cooperation point of view.

Features
► First book to address Cooperation in Wireless Networks ► First class authors offering their best research fields ► Compendium in Cooperation in Wireless Networks, wide and deep coverage ► Good balance between theory and practical issues ► The fastest emerging topic in wireless communications, becoming a real hot-topic

Field of interest
Communications Engineering, Networks

Target groups
Telecommunication engineers, professionals and lecturers, researchers in social and engineering domain, developers in industry, network engineers, graduate students, standardization related development and for the institutional market

Discount group
P

Due June 2006

2006. Approx. 470 p. Also available online. (Studies in Computational Intelligence, Volume 21) Hardcover
ISBN 3-540-32796-7 ► $169.00

Due July 2006

2006. Approx. 610 p. Hardcover
ISBN 3-540-32975-7 ► $199.00

Due April 2006

2006. Approx. 689 p. Hardcover
ISBN 1-4020-4710-X ► $109.00

Elements of Nonlinear Structural Engineering
Types of Nonlinear Structural Problems.

D. G. Fertis

This book is aiming to concentrate on the nonlinear static and dynamic analysis of structures and structural components that are widely used in everyday engineering applications. It approaches a nonlinear problem by mathematically converting it into an exact equivalent pseudolinear one, in contrast to commonly used approaches which are based on linear concepts. The new concepts, theories and methods introduced in this book, simplify the solution of the complex nonlinear problems, and also allow for the correct usage of the powerful existing linear methods of analysis. Based on this way of thinking, the book also provides a reasonable treatment regarding the nonlinear analysis of inelastic plates, suspension bridges and their failures, multistory buildings subjected to strong earthquakes, as well as many other interesting nonlinear problems, such as thick cylinders, inelastic torsion, inelastic vibrations, inelastic analysis of flexible members, and many more.

Features
► Presents an exciting new development out of Genetic Algorithms

Contents

Field of interest
Appl. Mathematics/Computational Methods of Engineering

Target groups
Researchers, engineers, Computer scientists, graduate students in Computational Intelligence, especially Genetic Algorithms

Discount group
P
Fracture Mechanics
With an Introduction to Micromechanics

Concerned with the fundamental concepts and methods of fracture mechanics and micromechanics, Fracture Mechanics primarily focuses on the mechanical description of the fracture process; however, material specific aspects are also discussed. The presentation of continuum mechanical and phenomenological foundations is followed by an introduction into classical failure hypotheses. A major part of the book is devoted to linear elastic and elastic-plastic fracture mechanics. Further subjects are creep fracture, dynamic fracture mechanics, damage mechanics, probabilistic fracture mechanics, failure of thin films and fracture of piezoelectric materials. The book also contains an extensive introduction into micromechanics. Self-contained and well-illustrated, this text serves as a graduate-level text and reference.

Features
► Self-contained and well illustrated
► Complete and comprehensive derivation of mechanical/mathematical results with emphasis on issues of practical importance ► Combines classical subjects of fracture mechanics with modern topics such as microheterogeneous materials, piezoelectric materials, thin films, damage ► Mechanically and mathematically clear and complete derivations of results

Field of interest
Continuum Mechanics and Mechanics of Materials

Target groups
Advanced students and engineers in mechanical and civil engineering

Discount group
P

Interactive Video
Methods and Applications

This book covers both algorithms and technologies of interactive videos, so that businesses in IT and data managements, scientists and software engineers in video processing and computer vision, coaches and instructors that use video technology in teaching, and finally end-users will greatly benefit from it.

This book contains excellent scientific contributions made by a number of pioneering scientists and experts from around the globe. It consists of five parts. The first part introduces the reader to interactive video and video summarization and presents effective methodologies for automatic abstraction of a single video sequence, a set of video sequences, and a combined audio-video sequence. In the second part, a list of advanced algorithms and methodologies for automatic and semi-automatic analysis and editing of audio-video documents are presented. The third part tackles a more challenging level of automatic video re-structuring, filtering of video stream by extracting of highlights, events, and meaningful semantic units. In particular, a detailed example of the Computational Media Aesthetics approach at work towards understanding the semantics of instructional media through automated analysis for e-learning content annotation is presented. The last part is reserved for interactive video searching engines, non-linear browsing and quick video navigational systems.

Features
► Presents recent research and application work for building and browsing interactive digital videos ► Deals mainly with low-level semi-automatic and full-automatic processing of the video content for intelligent human computer interaction ► Special focus on eye tracking methods

Field of interest
Signal Processing

Target groups
Academic and industrial researchers and multimedia experts

Discount group
P

Acoustic Echo and Noise Control
Selected Methods for the cancellation of acoustical echoes, the reduction of background noise, and speech processing

In this book, an international team of highly qualified experts treats important topics in “Acoustic Echo and Noise Control” and report the latest developments. Methods for enhancing the quality of transmitted speech signals are gaining growing attention in universities and in industrial development laboratories. This book is organized in five parts: Part I gives a short introduction to acoustic echo and noise control. Part II deals with multi-microphone processing. In Part III, advanced methods for both linear and nonlinear echo cancellation are presented, and techniques for intelligent control of hands-free telephones are introduced. Part IV is devoted to noise reduction procedures. An in-depth treatment of conventional and of advanced methods is given, followed by a model based approach using Kalman filters. Finally, in Part V, selected applications of acoustic echo and noise control as well as speech and audio processing in general are outlined. Topics such as auditory scene analysis, wave field synthesis for spatial sound reproduction, in-car communication systems, and hearing aids are treated.

Features
► Concentrates on the modern and advanced methods ► Written by an international team of highly qualified experts

Contents

Field of interest
Signal Processing

Target groups
Researchers in academia and industries

Discount group
P
A. O. Hero, University of Michigan, Ann Arbor, MI, USA; K. Kastella, General Dynamics Advanced Information Systems, Ypsilanti, MI, USA; D. Castanon, Boston University, Boston, MA, USA; D. Cochran, Arizona State University, Tempe, AZ, USA (Eds.)

Foundations and Applications of Sensor Management

Over the past few years the problem of active sensing has received an increasing amount of attention from researchers in areas such as signal processing, automatic control, statistics, and machine learning. Active sensing is recognized as an enabling technology for the next generation of agile, multi-modal, and multi-waveform sensor platforms to efficiently perform tasks such as target detection, tracking, and identification. In active sensing, the sequence of sensor actions, such as pointing angle, modality, or waveform, are selected adaptively based on information extracted from past measurements. When the adaptive selection rule is carefully designed such an on-line active approach to sensing can very significantly improve overall performance as compared to off-line approaches. However, due to the classic curse of dimensionality, design and implementation of optimal active sensing strategies has been and remain very challenging.

Recently, several research programs at DARPA (SWARMS, ISP), ARO (MURI), and AFOSR (ATR MURI) have funded efforts in areas related to active sensing. These resulted in focused efforts by several research groups in academia, government laboratories, and industry. These efforts have led to advances in theory and implementation that have borne some fruit in specific technology areas. For example, several promising new methods to detect, track, and identify are discussed in the rival literatures and performance tradeoffs is beginning to emerge.

Features
- Covers control theory signal processing and relevant applications in a unified manner
- Editors and contributors are pioneers in the area of active sensing and sensor management, and represent the diverse communities that are targeted

Field of interest
Signal Processing

Target groups
Signal processing engineers, control engineers, and radar engineers

Discount group
P

Y. Hori, Kanazawa Institute of Technology, Japan

Hydrodynamic Lubrication

Hydrodynamic lubrication plays an important role in mechanical engineering, although not very many books have been published on the subject. This book was written with graduate students, researchers and designers in view. The first four chapters are preparations for the following five chapters, where several most important subjects in hydrodynamic lubrication are discussed in detail, based on the author’s own researches. Examples are oil whip (stability of rotating shafts), foil bearings in connection with magnetic tape storages, squeeze film between rigid surfaces and visco-elastic surfaces, theoretical and experimental analyses of temperature rise in bearings, those of turbulent lubricating film using the k-epsilon model.

Features
- Important subjects studied by the author, such as stability of a multi-bearing shaft, seismic effects on oil whip, a limit cycle in an unstable region of a rotating shaft, sinusoidal squeeze phenomena, detailed experiments on temperature distribution in bearings, application of the k-epsilon model to turbulent flow in lubricating films have not been discussed in the rival literatures

Contents

Field of interest
Engineering Fluid Dynamics

Target groups
Engineers, graduate students, researchers

Discount group
P

Y. I. Huang, Lucent Technologies, Murray Hill, NJ, USA; J. Benesty, Universite de Quebec, Montréal, QC, Canada; J. Chen, Lucent Technologies, Murray Hill, NJ, USA

Acoustic MIMO Signal Processing

Telecommunication systems and human-machine interfaces start employing multiple microphones and loudspeakers in order to make conversations and interactions more lifelike, hence more efficient. This development gives rise to a variety of acoustic signal processing problems under multiple-input multiple-output (MIMO) scenarios, encompassing distant speech acquisition, sound source localization and tracking, echo and noise control, source separation and speech dereverberation, and many others.

Acoustic MIMO Signal Processing is divided into two major parts - the theoretical and the practical. The authors begin by introducing an acoustic MIMO paradigm, establishing the fundamental role in mechanical engineering, although not very important subjects in hydrodynamic lubrication are discussed in detail, based on the author’s own researches. Examples are oil whip (stability of rotating shafts), foil bearings in connection with magnetic tape storages, squeeze film between rigid surfaces and visco-elastic surfaces, theoretical and experimental analyses of temperature rise in bearings, those of turbulent lubricating film using the k-epsilon model.

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Computer-based Design and Manufacturing
An Information-Based Approach

As industry adopts a consumer focus in its product development strategy, it offers broader product ranges, shorter model lifetimes, and the ability to process orders in arbitrary lot sizes. This offers the ability to conduct early product design and development trade-off analysis among these competing objectives. The use of information technologies and networking capabilities is essential in the dissemination of product knowledge in order to integrate the decision-making process among heterogeneous and distributed partners / units. “Computer-based Design and Manufacturing” offers insights into the methods and techniques that enable implementing a consumer-focused product design philosophy by integrating capabilities for intelligent information support and group decision-making utilizing a common enterprise network model and knowledge interface through shared technologies.

The book will be a collection of the latest methods and state-of-the-art technologies in intelligent product and customer focused design. This book will offer:
- Discussion of applied methods developed in field of the product design
- Latest research results
- Discussion on the need and solutions for new engineering paradigm and philosophy required for product design
- Coverage of advances in information systems and technology in support of CFD
- Discussion of how to use web-based design environments

Field of interest
Industrial and Production Engineering

Target groups
Professional / technical readers, research directors, research associates and institutes involved in both design and manufacturing related projects (e.g. Texas Manufacturing Assistance Center), managers, product and process engineers within the product design and manufacturing departments of various companies (Ford, GM, etc), professors and research associates within universities and colleges in Industrial engineering, manufacturing engineering, mechanical engineering, and automotive engineering

Discount group
P

K. Kozlowski, Poznan University of Technology, Poznan, Poland (Ed.)

Robot Motion and Control
Recent Developments

“Robot Motion Control” presents very recent results in robot motion and control. Twenty papers have been chosen and expanded from fifty-three presented at the Fourth International Workshop on Robot Motion and Control held in Poland in June 2004. The authors of these papers have been carefully selected and represent leading institutions in this field.

The following recent developments are discussed:
- Design of trajectory planning schemes for holonomic and nonholonomic systems with optimization of energy, torque limitations and other factors.
- New control algorithms for industrial robots, nonholonomic systems and legged robots.
- Different applications of robotic systems in industry and everyday life, like medicine, education, entertainment and others.

The book is suitable for graduate students of automation and robotics, informatics and management, mechatronics, electronics and production engineering systems as well as scientists and researchers working in these fields.

Features
- Presents the most recent results and developments in the field of robot motion and control
- Covers nonlinear control of nonholonomic systems and legged robots as well as trajectory planning for these systems, topics which have not been covered in previous books

Field of interest
Control Engineering

Target groups
University and research laboratories; libraries; industries using robots for production or producing robots

Discount group
P

Z. Li, Fern Universität, Hagen, Germany

Fuzzy Chaotic Systems
Modeling, Control, and Applications

“Transition between Fuzzy and Chaotic Systems” provides original heuristic research achievements and insightful ideas on the interactions or intrinsic relationships between fuzzy logic and chaos theory. It presents the fundamental concepts of fuzzy logic and fuzzy control, chaos theory and chaos control, as well as the definition of chaos on the metric space of fuzzy sets. This monograph discusses and illustrates fuzzy modeling and fuzzy control of chaotic systems, synchronization, anti-control of chaos, intelligent digital redesign, spatiotemporal chaos and synchronization in complex fuzzy systems; as well as a practical application example of fuzzy-chaos-based cryptography. Like other very good books, this book may raise more questions than it can provide answers. It therefore generates a great potential to attract more attention to combine fuzzy systems with chaos theory and contains important seeds for future scientific research and engineering applications.

Features
- Overviews the theory, methodologies and applications of the fascinating field of Fuzzy systems and Chaos
- Generates a great potential to attract more attention to combine fuzzy systems with Chaos theory and contains important seeds for future scientific research and engineering applications.

From the contents

Field of interest
Appl.Mathematics/Computational Methods of Engineering

Target groups
Researchers, engineers, graduate students in Soft computing, Fuzziness and Complexity/Nonlinear Systems

Discount group
P
Parallel Evolutionary Computations

"Parallel Evolutionary Computation" focuses on the aspects related to the parallelization of evolutionary computations, such as parallel genetic operators, parallel fitness evaluation, distributed genetic algorithms, and parallel hardware implementations, as well as on their impact on several applications. The book is divided into four parts. The first part deals with a clear software-like and algorithmic vision on parallel evolutionary optimizations. The second part is about hardware implementations of genetic algorithms, a valuable topic which is hard to find in the present literature. The third part treats the problem of distributed evolutionary computation and presents three interesting applications wherein parallel EC new ideas are featured. Finally, the last part deals with the up-to-date field of parallel particle swarm optimization to illustrate the intrinsic similarities and potential extensions to techniques in this domain. The book offers a wide spectrum of sample works developed in leading research throughout the world about parallel implementations of efficient techniques at the heart of computational intelligence. It will be useful both for beginners and experienced researchers in the field of computational intelligence.

Contents

- Parallel Evolutionary Optimization
- Parallel Hardware for Genetic Algorithms
- Distributed Evolutionary Computation
- Parallel Swarm Particle Optimization

Field of interest

Appl. Mathematics/Computational Methods of Engineering

Target groups

Researchers, engineers, graduate students in Computational Intelligence, Evolutionary Algorithms

Discount group

P

Inventive Thinking through TRIZ
A Practical Guide

This is the second edition of the Michael Orloff's successful practical introduction to TRIZ (Theory of Innovative Problem Solving) - a strategy and method for breaking out of rigid thought patterns to achieve truly creative engineering solutions. Gerry Alshuller, originator of TRIZ in the former Soviet Union, devoted his career to convincing engineers that TRIZ turns inventing into a controllable and systematic process. In this book, Michael Orloff, Alshuller's former student, continues its algorithmic development and shows how to put TRIZ into action. Enabling readers to search for and find solutions efficiently, this book is of extreme practical importance to development engineers and planners in all areas of modern technology. Orloff not only explains the power and simplicity inherent in classical TRIZ, he further develops the methods with computer-aided innovations and Navigator refinements. The author's design firm is a rich source of the application of TRIZ in many technical fields.

Contents

- Introduction
- Methods of Inventing
- A-Studio: Algorithmic Navigation of Thinking
- Classical Navigators of Inventing in the A-Studio
- Strategy of Inventing
- Tactics of Inventing
- Art of Inventing
- Development of TRIZ

Field of interest

Engineering Design

Target groups

Design and development engineers

Discount group

P

Advances in Verification of Time Petri Nets and Timed Automata
A Temporal Logic Approach

This monograph presents a comprehensive introduction to timed automata (TA) and time Petri nets (TPNs) which belong to the most widely used models of real-time systems. Some of the existing methods of translating time Petri nets to timed automata are presented, with a focus on the translations that correspond to the semantics of time Petri nets, associating clocks with various components of the nets. "Advances in Verification of Time Petri Nets and Timed Automata – A Temporal Logic Approach" introduces timed and untimed temporal specification languages and gives model abstraction methods based on state class approaches for TPNs and on partition refinement for TA. Moreover, the monograph presents a recent progress in the development of two model checking methods, based on either exploiting abstract state spaces or on application of SAT-based symbolic techniques. The book addresses research scientists as well as graduate and PhD students in computer science, logics, and engineering of real time systems. refines for TA.

Contents

- Part I Specifying Timed Systems and Their Properties
  - Petri Nets with Time
  - From Time Petri Nets to Timed Automata
  - Main Formalisms for Expressing Temporal Properties
  - Part II Model Generation and Verification
  - Abstract Models
  - Explicit Verification
  - Verification Based on Satisfiability Checking

Field of interest

Appl. Mathematics/Computational Methods of Engineering

Target groups

Engineers, researchers, and students in Computational Intelligence

Discount group

P

Due June 2006

2006. Approx. 220 p. Also available online. (Studies in Computational Intelligence, Volume 22) Hardcover
ISBN 3-540-32837-8 ► $119.00

Due June 2006

ISBN 3-540-33222-7 ► Approx. $75.00

Due June 2006

2006. Approx. 280 p. Also available online. (Studies in Computational Intelligence, Volume 20) Hardcover
ISBN 3-540-32869-6 ► $119.00
Digital Holography and Three-Dimensional Display
Principles and Applications

Digital (or electronic) holography and its application to 3-D display is one of the formidable problems of evolving areas of high technology that has been receiving great attention in recent years. Indeed, the “Holy Grail” for 3-D display is the realization of life-size interactive 3-D displays.

Obviously, we are not there yet, but advances in 3-D display allow us to make important steps towards the Holy Grail. The theme of this book is to organize a collection of key chapters that covers digital holography and 3-D display techniques so as to provide the reader with the state-of-the-art developments in these important areas around the world.

Features
► Provides the reader with state-of-the-art developments in computer-generated holograms for white light reconstruction and digital interference holography

Contents

Field of interest
Applied Optics, Optoelectronics, Optical Devices

Target groups
Graduate students in optics, lasers, and electrical engineering, as well as scientists and engineers

Discount group
P

Probability and Risk Analysis
An Introduction for Engineers

This text presents notions and ideas at the foundations of a statistical treatment of risks. Such knowledge facilitates the understanding of the influence of random phenomena and gives a deeper understanding of the possibilities offered by and algorithms found in certain software packages. Since Bayesian methods are frequently used in this field, a reasonable proportion of the presentation is devoted to such techniques.

The text is written with a student in mind who has studied elementary undergraduate courses in engineering mathematics, maybe including a minor course in statistics. Despite employment of the style of presentation traditionally found in the mathematics literature (including descriptions like definitions, examples, etc.). Probability and Risk Analysis emphasizes an understanding of the theory and methods presented; hence, comments are given verbally and a reasoning is frequent.

With respect to the contents (and its presentation), the ambition has not been to write just another textbook on elementary probability and statistics. There are lots of such books, but instead the focus is on applications within the field of risk and safety analysis.

Features
► Focuses on statistical applications within the field of engineering risk and safety analysis
► Coverage includes Bayesian methods ► Statistical treatment of risks for engineering students which requires only elementary engineering math
► Differs from typical textbooks in its verbal approach to many explanations and examples

Field of interest
Statistics for Engineering, Physics, Computer Science, Chemistry & Geosciences

Target groups
Engineering students and researchers; students of applied mathematics and economics

Discount group
P
In electronics manufacture, the expanding range of products and the smaller-and-smaller scale of increasingly integrated components is producing a trend towards complex and fault-susceptible processes. This fact, coupled with shorter production times and the importance of quality assurance necessitates that process technology be more adaptable and open to new procedures than ever before.

"Electronics Process Technology" is a systemised presentation of new techniques and methods in electronics manufacture. Planning, preparation and execution are interlinked to achieve robust manufacturing processes that realise optimum quality, costs and quantities in the final product. Topics covered include: - modelling of manufacturing processes; - graph-theoretical approach to manufacturing planning; - process simulation and optimisation including cost optimisation.

Features
► Helps the reader reduce the cost and increase the reliability of electronic products by employing up-to-date technology and procedures ► The reader will learn the latest ideas for reducing the scale of electronic components and products to the nano-scale ► Organises all the elements of the complicated modern electronics manufacturing process showing how they affect each other

Field of interest
Electronics and Microelectronics, Instrumentation

Target groups
Researchers studying the applications of optimisation, simulation and quality control in electronics manufacture and production engineering; industrial engineers working in production planning, production design and reliability testing; libraries; graduate students in electronics, product engineering, quality management and systems theory

Discount group
P

P. Seibt, CNRS, Marseille, France

Algorithmic Information Theory
Mathematics of Digital Information Processing

This book treats the Mathematics of many important areas in digital information processing. It covers, in a unified presentation, five topics: Data Compression, Cryptography, Sampling (Signal Theory), Error Control Codes, Data Reduction. The thematic choices are practice-oriented. So, the important final part of the book deals with the Discrete Cosine Transform and the Discrete Wavelet Transform, acting in image compression. The presentation is dense, the examples and numerous exercises are concrete. The pedagogic architecture follows increasing mathematical complexity. A read-and-learn book on Concrete Mathematics, for teachers, students and practitioners in Electronic Engineering, Computer Science and Mathematics.

Features
► Read-and-learn book on Concrete Mathematics, for teachers, students and practitioners in Electronic Engineering, Computer Science and Mathematics ► Based on several lectures experiences, in particular lectures on information technology (Data Compaction, Cryptography, Polynomial Coding) for engineers

Contents

Field of interest
Algorithms

Target groups
Graduate students and scientists of information technology, engineers and mathematicians

Discount group
P

E. Suhir, ERS Company, Los Altos, CA, USA; Y. Lee, University of Colorado, Boulder, CO, USA; C. Wong, Georgia Tech, Atlanta, Georgia, USA (Eds.)

Micro- and Opto-Electronic Materials and Structures: Physics, Mechanics, Design, Reliability, Packaging


The handbook provides the most comprehensive, up-to-date and easy-to-apply information on the physics, mechanics, reliability and packaging of micro- and opto-electronic materials, assemblies, structures and systems. Each chapter contains a summary of the state-of-the-art in a particular field and practical recommendations on how to apply current knowledge and technology to design, manufacture and operate a viable, reliable and cost-effective electronic component or photonic device, and on how to make such a device into a successful commercial product.

The handbook can be used as a reference and as a manual for self-education. Designed and written for electrical, materials, mechanical, and reliability engineers, as well as applied physicists and materials scientists - this will be an essential reference for all those who are interested in the state-of-the-art of micro- and opto-electronic materials, packaging, and reliability, with an emphasis on physical design problems, challenges, and solutions.

Features
► Most up-to-date, in-depth, practical and easy-to-use information on micro- and opto-electronic materials, assemblies, structures and systems ► Practical recommendations are offered on how to successfully apply current knowledge ► Treatment of recently developed technology to design, manufacture and operate viable, reliable and cost-effective electronic components or photonic devices ► Written by the best specialists in the field

Field of interest
Electronics and Microelectronics, Instrumentation

Target groups
Libraries, research labs and R&D departments in the microelectronics industry

Discount group
P
**Advances in Information Technologies for Electromagnetics**

Advances in Information Technologies for Electromagnetics offers a broad panorama on recently achieved and potentially obtainable advances in electromagnetics with innovative IT technologies. Simple tutorial chapters introduce the reader to cutting edge technologies, such as parallel and distributed computing, object-oriented technologies, grid computing, semantic grids, agent based computing and service-oriented architectures. On such bases, a variety of EM applications is proposed: 1) parallel FDTD codes (both for antenna analysis and for metamaterial applications), 2) grid computing for computational EM (CEM) (with applications to antenna arrays, wireless and remote-sensing systems) 3) mobile agents for parametric CEM modeling 4) complex/hybrid EM software environments (with applications to planar circuits, quasi-optical systems,...) 5) semantic grids for CAE of antennas arrays. This way the reader, after learning from very schematic tutorials the most relevant features of IT tools, has an immediate feeling of their impact on daily EM research.

**Features**
- A unique combination of edge-cutting IT tools and EM techniques and know-how
- A variety of EM industrial applications appealing for people working on IT
- Description of new IT tools appealing for EM research and industry
- A unique tool to bridge the gap between IT and EM communities

**Field of interest**
Electronics and Computer Engineering

**Target groups**
University and industrial researchers, university professors and students, IT and microwave/antenna consultants

**Discount group**
P

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**Atmospheric and Space Flight Dynamics**

Modern aerospace vehicles, such as the space shuttle, other launch vehicles, and long-range ballistic missiles, do not discriminate between atmospheric and space flight. Most texts on flight dynamics, however, make this artificial distinction and therefore do not simultaneously cover aircraft and spacecraft. Bridging this gap in the literature, "Atmospheric and Space Flight Dynamics" is a unified presentation, demonstrating that the two disciplines have actually evolved from the same set of physical principles. Introduced is a broad range of modern topics in an accessible, yet mathematically rigorous presentation. A key feature of the text is the integration of many MATLAB- and Simulink-based numerical examples and real-world simulations throughout for the design of aircraft, missiles, launch vehicles, re-entry vehicles, and spacecraft. The author uses the software as an instructional, hands-on tool, moving away from the "cook book" approach found in other works. Replete with illustrations, end-of-chapter exercises, and selected solutions, the work is primarily useful as a textbook for advanced undergraduate and beginning graduate-level students.

**Features**
- Unified presentation does not discriminate between atmospheric and space flight
- Introduces a broad range of critical concepts in an accessible, yet mathematically rigorous presentation
- Features of MATLAB- and Simulink-based numerical examples and real-world simulations

**Field of interest**
Automotive and Aerospace Engineering

**Target groups**
Researchers and engineers in Thermodynamics

**Discount group**
P

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**Simulation in Engineering Thermodynamics with Entropy**

Understanding Matter by Bondgraphs

**Features**
- Presents a new treatment of Thermodynamics with Bondgraphs

**Contents**
Thermodynamics as a Universal Science - Frictions and Irreversibilities - Mass Flows - Chemical equilibria and entropy - Entropy and Information Theory

**Field of interest**
Theoretical and Applied Mechanics

**Target groups**
Researchers and engineers in Thermodynamics

**Discount group**
P

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**Birkhäuser**

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Applications of Soft Computing

Recent Trends

Soft Computing is a complex of methodologies that embraces approximate reasoning, imprecision, uncertainty and partial truth in order to mimic the remarkable human capability of making decisions in real-life, ambiguous environments. Soft Computing has therefore become popular in developing systems that encapsulate human expertise. Applications of Soft Computing: Recent Trends contains a collection of papers that were presented at the 10th Online World Conference on Soft Computing in Industrial Applications, held in September 2005. This carefully edited book provides a comprehensive overview of the recent advances in the industrial applications of soft computing and covers a wide range of application areas, including optimisation, data analysis and data mining, computer graphics and vision, prediction and diagnosis, design, intelligent control, and traffic and transportation systems. The book is aimed at researchers and professional engineers who are engaged in developing and applying intelligent systems. It is also suitable as wider reading for science and engineering postgraduate students.

Features

- Comprehensive overview of the recent advances in the industrial applications of soft computing
- Covers a wide range of application areas, including optimisation, data analysis and data mining, computer graphics and vision, prediction and diagnosis, design, intelligent control, and traffic and transportation systems
- Contains a collection of papers that were presented at the 10th Online World Conference on Soft Computing in Industrial Applications, held in September 2005

Field of interest

Applied Mathematics/Computational Methods of Engineering

Target groups

Researchers and professional engineers who are engaged in developing and applying intelligent systems and who deal with industrial applications of soft computing techniques

Discount group

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Effective Functional Verification

Principles and Processes

This book is primarily a book on Functional Verification. This book discusses Functional verification in some depth. Effective Functional Verification is organized so that the first 4 chapters appeal to newcomers to the field. There is a survey of various verification methodologies and a discussion of them. The middle chapters (5,6,7) are targeted towards people in management and higher up on the experience ladder. New verification engineers reading these chapters know what's expected and how things work in verification and some case studies are presented.

The last few chapters (8-11) are the result of experience of several years. It goes into how to optimize a verification plan and an environment and how to get results effectively. How five habits help form a successful strategy. Various subjects are discussed here to get the most out of a verification environment.

The appendix discusses some tool specifics to help remove repetitive work and also some tool specific guidelines.

Features

- Case Studies, Processes and Principles of verification
- Coverage of Planning and closure aspects
- Tips to make verification easier

Contents


Field of interest

Circuits and Systems

Target groups

Senior verification engineers, students, professionals

Discount group

P

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Calibration Techniques in Nyquist A/D Converters

Calibration Techniques in Nyquist A/D Converters analyses different A/D-converter architectures with an emphasis on the maximum achievable power efficiency. It is shown that in order to achieve high speed and high accuracy at high power efficiency, calibration is required. Calibration reduces the overall power consumption by using the available digital processing capability to relax the demands on critical power hungry analog components. Several calibration techniques are analyzed. The calibration techniques presented in this book are applicable to other analog-to-digital systems, such as those applied in integrated receivers. Further refinements will allow using analog components with less accuracy, which will then be compensated by digital signal processing. The presented methods allow implementing this without introducing a speed or power penalty.

Features

- Provides an accessible overview of the state-of-the art in Nyquist A/D converter design
- Analyses the maximum power efficiency in Nyquist A/D converters
- Provides an accessible overview of the state-of-the art in calibration techniques for Nyquist A/D converters
- Presents enhancement techniques for two-step architectures

From the contents


Field of interest

Circuits and Systems

Target groups

Mixed-signal designers who want to familiarize with Nyquist A/D converter design and calibration, system architects dealing with conversion systems, data converter specialists who are interested in calibration techniques

Discount group

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Field of interest

Circuits and Systems

Target groups

Senior verification engineers, students, professionals

Discount group

P

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- Tips to make verification easier

Contents


Field of interest

Circuits and Systems

Target groups

Senior verification engineers, students, professionals

Discount group

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Features

- Case Studies, Processes and Principles of verification
- Coverage of Planning and closure aspects
- Tips to make verification easier

Contents

Robust Control and Filtering of Singular Systems

S. Xu, Nanjing University of Science and Technology, China; J. Lam, University of Hong Kong, China

Singular systems have been widely studied in the past two decades due to their extensive applications in modelling and control of electrical circuits, power systems, economics and other areas. Interest has grown recently in the stability analysis and control of singular systems with parameter uncertainties due to their frequent presence in dynamic systems, which is much more complicated than that of state-space systems because controllers must be designed so that the closed-loop system is not only robustly stable, but also regular and impulse-free (in the continuous case) or causal (in the discrete case), while the latter two issues do not arise in the state-space case. This monograph aims to present up-to-date research developments and references on robust control and filtering of uncertain singular systems in a unified matrix inequality setting. It provides a coherent approach to studying control and filtering problems as extensions of state-space systems without the commonly used slow-fast decomposition. It contains valuable reference material for researchers wishing to explore the area of singular systems, and its contents are also suitable for a one-semester graduate course.

Contents

Field of interest
Control Engineering

Target groups
Engineers, researchers and students in Control

Due July 2006
2006. Approx. 220 p. Also available online. (Lecture Notes in Control and Information Sciences, Volume 332) Softcover
ISBN 3-540-32797-5 ► $99.00

Due June 2006
ISBN 3-540-32801-7 ► $169.00

Field and Service Robotics
Recent Advances in Research and Applications

S. Yuta, University of Tsukuba, Japan; H. Asama, University of Tokyo, Japan; S. Thrun, University of Stanford, USA; E. Prassler, University of Ulm, Germany; T. Tsubouchi, University of Tsukuba, Japan (Eds.)

Since its inception in 1996, FSR, the biannual “International Conference on Field and Service Robotic’s has published archival volumes of high reference value. This unique collection is the post-conference proceedings of the 4th FSR in Lake Yamanaka, Japan at July 2003. This book edited by Shin’ichi Yuta, Hajime Asama, Sebastian Thrun, Erwin Prassler and Takashi Tsubouchi is rich by topics and authoritative contributors and presents the current developments and new directions in field and service robotics. The contents of these contributions represent a cross-section of the current state of robotics research from one particular aspect: field and service applications, and how they reflect on the theoretical basis of subsequent developments. Pursuing technologies aimed at realizing skilful, smart, reliable, robust field and service robots is the big challenge running throughout this focused collection.

Features
► Presents the current developments and new directions in field and service robotics. ► Rich by topics and authoritative contributors ► Post-conference proceedings of the 4th “International Conference on Field and Service Robotics”

Contents

Field of interest
Automation and Robotics

Target groups
Researchers, graduate students and professionals in Robotics

Discount group
P

Discount group
P