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Robotics Research - Tamim Asfour 2022
This book contains the papers that were presented at the 17th International Symposium of Robotics Research (ISRR). The ISRR promotes the development and dissemination of groundbreaking research and technological innovation in robotics useful to society by providing a lively, intimate, forward-looking forum for discussion and debate about the current status and future trends of robotics with great emphasis on its potential role to benefit humankind. The symposium contributions contained in this book report on a variety of new robotics research results covering a broad spectrum organized into the categories: design, control; grasping and manipulation, planning, robot vision, and robot learning.

Cognitive Systems and Signal Processing - Fuchun Sun 2017-07-07
This book constitutes the refereed proceedings of the Third International Conference on Cognitive Systems and Signal Processing, ICCSIP2016, held in Beijing, China, in December 2016. The 59 revised full papers presented were carefully reviewed and selected from 171 submissions. The papers are organized in topical sections on Control and Decision; Image and Video; Machine Learning; Robotics; Cognitive System; Cognitive Signal Processing.

Neural Computation in Embodied Closed-Loop Systems for the Generation of Complex Behavior: From Biology to Technology - Poramate Manoonpong 2018-10-11
How can neural and morphological computations be effectively combined and realized in embodied closed-loop systems (e.g., robots) such that they can become more like living creatures in their level of performance? Understanding this will lead to new technologies and a variety of applications. To tackle this research question, here, we bring together experts from different fields (including Biology, Computational Neuroscience, Robotics, and Artificial Intelligence) to share their recent findings and ideas and to update our research community. This eBook collects 17 cutting edge research articles, covering neural and morphological computations as well as the transfer of results to real world applications, like prosthesis and orthosis control and neuromorphic hardware implementation.

Robust Robotic Grasp Control - Craig Bonneville 1991

Artificial Intelligence in Real-Time Control 1992 - M.G. Rodd 2014-06-28
The symposium had two main aims, to investigate the state-of-the-art in the application of artificial intelligence techniques in real-time control, and to bring together control system specialists, artificial intelligence specialists and end-users. Many professional engineers working in

industry feel that the gap between theory and practice in applying control and systems theory is widening, despite efforts to develop control algorithms. Papers presented at the meeting ranged from the theoretical aspects to the practical applications of artificial intelligence in real-time control. Themes were: the methodology of artificial intelligence techniques in control engineering; the application of artificial intelligence techniques in different areas of control; and hardware and software requirements. This symposium showed that there exist alternative possibilities for control based on artificial intelligence techniques.

Closed-Loop Systems for Next-Generation Neuroprostheses - Timothée Levi 2018-04-26

Millions of people worldwide are affected by neurological disorders which disrupt the connections within the brain and between brain and body causing impairments of primary functions and paralysis. Such a number is likely to increase in the next years and current assistive technology is yet limited. A possible response to such disabilities, offered by the neuroscience community, is given by Brain-Machine Interfaces (BMIs) and neuroprostheses. The latter field of research is highly multidisciplinary, since it involves very different and disperse scientific communities, making it fundamental to create connections and to join research efforts. Indeed, the design and development of neuroprosthetic devices span/involve different research topics such as: interfacing of neural systems at different levels of architectural complexity (from in vitro neuronal ensembles to human brain), bio-artificial interfaces for stimulation (e.g. micro-stimulation, DBS: Deep Brain Stimulation) and recording (e.g. EMG: Electromyography, EEG: Electroencephalography, LFP: Local Field Potential), innovative signal processing tools for coding and decoding of neural activity, biomimetic artificial Spiking Neural Networks (SNN) and neural network modeling. In order to develop functional communication with the nervous system and to create a new generation of neuroprostheses, the study of closed-loop systems is mandatory. It has been widely recognized that closed-loop neuroprosthetic systems achieve more favorable outcomes for users then equivalent open-loop devices. Improvements in task performance, usability, and embodiment have all been reported in systems utilizing some form of feedback. The bi-directional communication between living neurons and artificial devices is the main final goal of those studies. However, closed-loop systems are still uncommon in the literature, mostly due to requirement of multidisciplinary effort. Therefore, through eBook on closed-loop systems for next-generation neuroprostheses, we encourage an active discussion among neurobiologists, electrophysiologists, bioengineers, computational neuroscientists and neuromorphic engineers. This eBook aims to facilitate this process by ordering the 25 contributions of this research in which we highlighted in three different parts: (A) Optimization of different blocks composing the closed-loop system, (B) Systems for neuromodulation based on DBS, EMG and SNN and (C) Closed-loop BMIs for rehabilitation.

Theory and Practice of Control and Systems - A Tornambe 1999-01-04

This volume gathers together all the lectures presented at the 6th IEEE Mediterranean Conference. It focuses on the mathematical aspects in the theory and practice of control and systems, including stability and stabilizability, robust control, adaptive control, robotics and manufacturing; these topics are under intense investigation and development in the engineering and mathematics communities. The volume should have immediate appeal for a large group of engineers and mathematicians who are interested in very abstract as well as very concrete aspects of control and system theory. Contents: Quantified Multivariate Polynomial Inequalities: The Mathematics of (Almost) All Practical Control Design Problems (P Dorato)Digital Second Order Sliding Mode Control with Uncertainties Estimation for a Class of SISO Nonlinear Systems (G Bartolini et al.)Development and Identification of a Hierarchical System of Models for Rapid Prototyping of Si Engines (I Arsie et al.)Identification of Uncertainty Models for Robust Control Design (S Malan et al.)Second Order Chattering-Free Sliding Mode Control for Some Classes of Multi-Input Uncertain Nonlinear Systems (G Bartolini et al.)Sliding Mode Output Regulation of Linear and Nonlinear Systems with Relative Degree One (L Marconi et al.)Output Control of

Nonlinear Systems with Multiple Discrete Delays (M Dalla Mora et al.)Analytical Synthesis of Least Curvature 2D Paths for Underwater Applications (G Indiveri et al.)Modelling and Control of Nonsmooth Hybrid Mechanical Systems (B Brogliato)Global Temperature Stabilization of Chemical Reactors with Bounded Control (R Antonelli & A Astolfi)Detection and Accommodation of Second Order Distributed Parameter Systems with Abrupt Changes in Input Term: Existence and Approximation (M A Demetriou et al.)Discrete-Event Models of Manufacturing Systems (E Canuto)Optimization of Internal Forces in Force-Closure Grasps (A Bicchi et al.)Loading Parts and Tools in a Flexible Manufacturing System (D Pacciarelli)and other papers Readership: Researchers in control & system theory, electrical & electronic engineering, mechanical & knowledge engineering and robotics.

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.

Brain-Computer Interfaces: Lab Experiments to Real-World Applications - 2016-08-27

Brain-Computer Interfaces: Lab Experiments to Real-World Applications, the latest volume in the Progress in Brain Research series, focuses on new trends and developments. This established international series examines major areas of basic and clinical research within the neurosciences, as well as popular and emerging subfields. Explores new trends and developments in brain research Enhances the literature of neuroscience by further expanding this established, ongoing international series Examines major areas of basic and clinical research within the field

Fundamentals of Mechanics of Robotic Manipulation - Marco Ceccarelli 2022

The book explores the fundamental issues of robot mechanics for both the analysis and design of manipulations, manipulators and grippers, taking into account a central role of mechanics and mechanical structures in the development and use of robotic systems with mechatronic design. It examines manipulations that can be performed by robotic manipulators. The contents of the book are kept at a fairly practical level with the aim to teach how to model, simulate, and operate robotic mechanical systems. The chapters have been written and organized in a way that they can be red even separately, so that they can be used separately for different courses and purposes. The introduction illustrates motivations and historical developments of robotic mechanical systems. Chapter 2 describes the analysis and design of manipulations by automatic machinery and robots; chapter 3 deals with the mechanics of serial-chain manipulators with the aim to propose algorithms for analysis, simulation, and design purposes; chapter 4 introduces the mechanics of parallel manipulators; chapter 5 addresses the attention to mechanical grippers and related mechanics of grasping.

Advances in Mechatronics and Control Engineering II - Krzysztof Galkowski 2013-10-15

Collection of selected, peer reviewed papers from the 2013 2nd International Conference on Mechatronics and Control Engineering (ICMCE 2013), August 28-29, 2013, Guangzhou, China. Volume is indexed by Thomson Reuters CPCI-S (WoS). The 485 papers are grouped as follows: Chapter 1: Theory of Mechanisms and Mechanical Dynamics Chapter 2: Industrial Robotics and Automation; Chapter 3: Design and Control in Modern Mechatronics System Engineering; Chapter 4: Sensor Technology; Chapter 5: Voice, Image and Video Processing; Chapter 6: Signal Processing System; Chapter 7: Artificial Intelligence and Computational Algorithms; Chapter 8: Measurement Technology, Testing

and Instruments; Chapter 9: Automatic Control Technology; Chapter 10: Electric Automation; Chapter 11: Intelligent Traffic Control; Chapter 12: Electronics Technology and Embedded Systems; Chapter 13: Software Development and Application; Chapter 14: Computer Application in Industry and Engineering; Chapter 15: Fluid Engineering and Hydrodynamics; Chapter 16: Materials; Chapter 17: Research and Design in Mechanical Engineering; Chapter 18: Structural Engineering and Architecture Analysis; Chapter 19: Industrial Engineering and Production Operations Management; Chapter 20: Engineering Education

Motion Control Systems - Asif Sabanovic 2011-03-10

Motion Control Systems is concerned with design methods that support the never-ending requirements for faster and more accurate control of mechanical motion. The book presents material that is fundamental, yet at the same time discusses the solution of complex problems in motion control systems. Methods presented in the book are based on the authors' original research results. Mathematical complexities are kept to a required minimum so that practicing engineers as well as students with a limited background in control may use the book. It is unique in presenting know-how accumulated through work on very diverse problems into a comprehensive unified approach suitable for application in high demanding, high-tech products. Major issues covered include motion control ranging from simple trajectory tracking and force control, to topics related to haptics, bilateral control with and without delay in measurement and control channels, as well as control of nonredundant and redundant multibody systems. Provides a consistent unified theoretical framework for motion control design Offers graduated increase in complexity and reinforcement throughout the book Gives detailed explanation of underlying similarities and specifics in motion control Unified treatment of single degree-of-freedom and multibody systems Explains the fundamentals through implementation examples Based on classroom-tested materials and the authors' original research work Written by the leading researchers in sliding mode control (SMC) and disturbance observer (DOB) Accompanying lecture notes for instructors Simulink and MATLAB® codes available for readers to download Motion Control Systemsis an ideal textbook for a course on motion control or as a reference for post-graduates and researchers in robotics and mechatronics. Researchers and practicing engineers will also find the techniques helpful in designing mechanical motion systems.

Sensorimotor Control of Grasping - Dennis A. Nowak 2009-06-25

The human hand can take on a huge variety of shapes and functions, providing its owner with a powerful hammer at one time or a delicate pair of forceps at another. The universal utility of the hand is even more enhanced by the ability to amplify the function of the hand by using tools. To understand and appreciate how the human brain controls movements of the hand, it is important to investigate both the healthy motor behaviour and dysfunction during everyday manipulative tasks. This book provides a contemporary summary of the physiology and pathophysiology of the manipulative and exploratory functions of the human hand. With contributions from scientists and clinical researchers of biomechanics, kinesiology, neurophysiology, psychology, physical medicine and rehabilitation, it covers the development of healthy human grasping over the lifespan, the wide spectrum of disability in the pathological state and links basic motor research with modern brain sciences.

Intelligent Robotics and Applications - Jangmyung Lee 2013-08-23

This two volumes set LNAI 8102 and LNAI 8103 constitutes the refereed proceedings of the 6th International Conference on Intelligent Robotics and Applications, ICIRA 2013, held in Busan, South Korea, in September 2013. The 147 revised full papers presented were carefully reviewed and selected from 184 submissions. The papers discuss various topics from intelligent robotics, automation and mechatronics with particular emphasis on technical challenges associated with varied applications such as biomedical application, industrial automation, surveillance and sustainable mobility.

Advanced Mobile Robotics - DaeEun Kim 2020-03-06

Mobile robotics is a challenging field with great potential. It covers disciplines including electrical engineering, mechanical engineering, computer science, cognitive science, and social science. It is essential to the design of automated robots, in combination with artificial

intelligence, vision, and sensor technologies. Mobile robots are widely used for surveillance, guidance, transportation and entertainment tasks, as well as medical applications. This Special Issue intends to concentrate on recent developments concerning mobile robots and the research surrounding them to enhance studies on the fundamental problems observed in the robots. Various multidisciplinary approaches and integrative contributions including navigation, learning and adaptation, networked system, biologically inspired robots and cognitive methods are welcome contributions to this Special Issue, both from a research and an application perspective.

Tactile Sensors for Robotic Applications - Salvatore Pirozzi 2021-03-17

The book covers different aspects: - Innovative technologies for tactile sensors development - Tactile data interpretation for control purposes - Alternative sensing technologies - Multi-sensor systems for grasping and manipulation - Sensing solutions for impaired people

Army Research and Development - 1969

Applied Mechanics Reviews - 1988

Closed-loop Interfaces for Neuroelectronic Devices and Assistive Robots - Loredana Zollo 2022-04-28

Journal of Rehabilitation Research and Development - 1983

Time-Synchronized Control: Analysis and Design - Dongyu Li 2021

Previous research on fixed/finite-time sliding-mode control focuses on forcing a system state (vector) to converge within a certain time moment, regardless of how each state element converges. This book introduces a control problem with unique finite/fixed-time stability considerations, namely time-synchronized stability, where at the same time, all the system state elements converge to the origin, and fixed-time-synchronized stability, where the upper bound of the synchronized settling time is invariant with any initial state. Accordingly, sufficient conditions for (fixed-) time-synchronized stability are presented. These stability formulations grant essentially advantageous performance when a control system (with diversified subsystems) is expected to accomplish multiple actions synchronously, e.g., grasping with a robotic hand, multi-agent simultaneous cooperation, etc. Further, the analytical solution of a (fixed) time-synchronized stable system is obtained and discussed. Applications to linear systems, disturbed nonlinear systems, and network systems are provided. In addition, comparisons with traditional fixed/finite-time sliding mode control are suitably detailed to showcase the full power of (fixed-) time-synchronized control.

Robots and Biological Systems: Towards a New Bionics? - Paolo Dario 2012-12-06

Bionics evolved in the 1960s as a framework to pursue the development of artificial systems based on the study of biological systems. Numerous disciplines and technologies, including artificial intelligence and learningdevices, information processing, systems architecture and control, perception, sensory mechanisms, and bioenergetics, contributed to bionics research. This volume is based on a NATO Advanced Research Workshop within the Special Programme on Sensory Systems for Robotic Control, held in Il Ciocco, Italy, in June 1989. A consensus emerged at the workshop, and is reflected in the book, on the value of learning from nature in order to derive guidelines for the design of intelligent machines which operate in unstructured environments. The papers in the book are grouped into seven chapters: vision and dynamic systems, hands and tactile perception, locomotion, intelligent motor control, design technologies, interfacing robots to nervous systems, and robot societies and self-organization.

Mathematical and Control Applications in Agriculture and Horticulture - W. Day 2014-07-04

This title provides a general overview of recent developments and research into types of systems and their uses in the agricultural and horticultural industry. 64 papers are included, containing both theoretical models and applied examples for greenhouse systems, harvesting technology and plant factory systems.

Grasping in Robotics - Giuseppe Carbone 2012-11-15

Grasping in Robotics contains original contributions in the field of grasping in robotics with a broad multidisciplinary approach. This gives the possibility of addressing all the major issues related to robotized grasping, including milestones in grasping through the centuries, mechanical design issues, control issues, modelling achievements and issues, formulations and software for simulation purposes, sensors and vision integration, applications in industrial field and non-conventional applications (including service robotics and agriculture). The contributors to this book are experts in their own diverse and wide ranging fields. This multidisciplinary approach can help make Grasping in Robotics of interest to a very wide audience. In particular, it can be a useful reference book for researchers, students and users in the wide field of grasping in robotics from many different disciplines including mechanical design, hardware design, control design, user interfaces, modelling, simulation, sensors and humanoid robotics. It could even be adopted as a reference textbook in specific PhD courses.
Masters Abstracts International - 1993

Converging Clinical and Engineering Research on Neurorehabilitation III - Lorenzo Masia 2018-10-15
The book reports on advanced topics in the areas of neurorehabilitation research and practice. It focuses on new methods for interfacing the human nervous system with electronic and mechatronic systems to restore or compensate impaired neural functions. Importantly, the book merges different perspectives, such as the clinical, neurophysiological, and bioengineering ones, to promote, feed and encourage collaborations between clinicians, neuroscientists and engineers. Based on the 2018 International Conference on Neurorehabilitation (ICNR 2018) held on October 16-20, 2018, in Pisa, Italy,, this book covers various aspects of neurorehabilitation research and practice, including new insights into biomechanics, brain physiology, neuroplasticity, and brain damages and diseases, as well as innovative methods and technologies for studying and/or recovering brain function, from data mining to interface technologies and neuroprosthetics. In this way, it offers a concise, yet comprehensive reference guide to neurosurgeons, rehabilitation physicians, neurologists, and bioengineers. Moreover, by highlighting current challenges in understanding brain diseases as well as in the available technologies and their implementation, the book is also expected to foster new collaborations between the different groups, thus stimulating new ideas and research directions.
Wearable Robots - José L. Pons 2008-04-15
A wearable robot is a mechatronic system that is designed around the shape and function of the human body, with segments and joints corresponding to those of the person it is externally coupled with. Teleoperation and power amplification were the first applications, but after recent technological advances the range of application fields has widened. Increasing recognition from the scientific community means that this technology is now employed in telemanipulation, man-amplification, neuromotor control research and rehabilitation, and to assist with impaired human motor control. Logical in structure and original in its global orientation, this volume gives a full overview of wearable robotics, providing the reader with a complete understanding of the key applications and technologies suitable for its development. The main topics are demonstrated through two detailed case studies; one on a lower limb active orthosis for a human leg, and one on a wearable robot that suppresses upper limb tremor. These examples highlight the difficulties and potentialities in this area of technology, illustrating how design decisions should be made based on these. As well as discussing the cognitive interaction between human and robot, this comprehensive text also covers: the mechanics of the wearable robot and it’s biomechanical interaction with the user, including state-of-the-art technologies that enable sensory and motor interaction between human (biological) and wearable artificial (mechatronic) systems; the basis for bioinspiration and biomimetism, general rules for the development of biologically-inspired designs, and how these could serve recursively as biological models to explain biological systems; the study on the development of networks for wearable robotics. Wearable Robotics: Biomechatronic Exoskeletons will appeal to lecturers, senior

undergraduate students, postgraduates and other researchers of medical, electrical and bio engineering who are interested in the area of assistive robotics. Active system developers in this sector of the engineering industry will also find it an informative and welcome resource.

Biomechanics and Neural Control of Posture and Movement - Jack M. Winters 2012-12-06

Most routine motor tasks are complex, involving load transmission through out the body, intricate balance, and eye-head-shoulder-hand-torso-leg coor dination. The quest toward understanding how we perform such tasks with skill and grace, often in the presence of unpredictable perturbations, has a long history. This book arose from the Ninth Engineering Foundation Con ference on Biomechanics and Neural Control of Movement, held in Deer Creek, Ohio, in June 1996. This unique conference, which has met every 2 to 4 years since the late 1960s, is well known for its informal format that promotes high-level, up-to-date discussions on the key issues in the field. The intent is to capture the high quality ofthe knowledge and discourse that is an integral part of this conference series. The book is organized into ten sections. Section I provides a brief intro duction to the terminology and conceptual foundations of the field of move ment science; it is intended primarily for students. All but two of the re maining nine sections share a common format: (l) a designated section editor; (2) an introductory didactic chapter, solicited from recognized lead ers; and (3) three to six state-of-the-art perspective chapters. Some per spective chapters are followed by commentaries by selected experts that provide balance and insight. Section VI is the largest section, and it con sists of nine perspective chapters without commentaries.

The Mechanics of Robot Grasping - Elon Rimon 2019-10-24

This comprehensive look at the major concepts in robot grasp mechanics serves as a valuable reference for all robotics enthusiasts.

Control Aspects of Prosthetics and Orthotics - R. M. Campbell 2014-05-23

Control Aspects of Prosthetics and Orthotics covers the proceedings of the International Federation of Automatic Control (IFAC) Symposium that tackles issues relating to the control systems of prosthetics and orthotics device. The book organizes topics according to the sessions of the symposium. Session 1 deals with the functional muscle and nerve simulation, while Session 2 discusses the man-machine mechanical and information interface. The third session covers sensory replacement and artificial organs, while the fourth session tackles instrumentation, medical devices, and clinical procedures. The last session discusses robotics and mechanics. The text will be of great interest to physicians, physical therapists, orthotists, and prosthetists, whose line of work involves prosthetics and orthotics systems.

Neural Prostheses for Restoration of Sensory and Motor Function - John K. Chapin 2000-09-27

The prospect of interfacing the nervous system with electronic devices to stimulate or record from neural tissue suggests numerous possibilities in the field of neuroprosthetics. While the creation of a "six million dollar man" may still be far into the future, neural prostheses are rapidly becoming viable theories for a broad range of patients wit

Emerging Trends in Mechatronics - Aydin Azizi 2020-01-15

Mechatronics is a multidisciplinary branch of engineering combining mechanical, electrical and electronics, control and automation, and computer engineering fields. The main research task of mechatronics is design, control, and optimization of advanced devices, products, and hybrid systems utilizing the concepts found in all these fields. The purpose of this special issue is to help better understand how mechatronics will impact on the practice and research of developing advanced techniques to model, control, and optimize complex systems. The special issue presents recent advances in mechatronics and related technologies. The selected topics give an overview of the state of the art and present new research results and prospects for the future development of the interdisciplinary field of mechatronic systems.

Mechanics and Control of Soft-fingered Manipulation - Takahiro Inoue 2008-11-28

“Mechanics and Control of Soft-fingered Manipulation” introduces a new

approach to the modeling of fingertips that have a soft pad and a hard back plate, similar to human fingers. Starting from the observation of soft-fingered grasping and manipulation, the book provides a parallel distributed model that takes into account tangential deformation of the fingertips. The model is supported with many experimental verifications and simulation results. Statics and dynamics in soft-fingered grasping and manipulation are also formulated based on this new model. The book uniquely investigates how soft fingertips with hard back plates enhance dexterity in grasping and manipulation, theoretically and experimentally, revealing the differences between soft-fingered and rigid-fingered manipulation. Researchers involved in object manipulation by robotic hands, as well as in human dexterity in object manipulation, will find this text enlightening.

Shared Grasping: a Combination of Telepresence and Grasp Planning - Hertkorn, Katharina 2016-04-29

Fusion of Hard and Soft Control Strategies for the Robotic Hand - Cheng-Hung Chen 2017-09-13

An in-depth review of hybrid control techniques for smart prosthetic hand technology by two of the world's pioneering experts in the field Long considered the stuff of science fiction, a prosthetic hand capable of fully replicating all of that appendage's various functions is closer to becoming reality than ever before. This book provides a comprehensive report on exciting recent developments in hybrid control techniques—one of the most crucial hurdles to be overcome in creating smart prosthetic hands. Coauthored by two of the world's foremost pioneering experts in the field, Fusion of Hard and Soft Control Strategies for Robotic Hand treats robotic hands for multiple applications. Itbegins withan overview of advances in main control techniques that have been made over the past decade before addressing the military context for affordable robotic hand technology with tactile and/or proprioceptive feedback for hand amputees. Kinematics, homogeneous transformations, inverse and differential kinematics, trajectory planning, and dynamic models of two-link thumb and three-link index finger are discussed in detail. The remainder of the book is devoted to the most promising soft computing techniques, particle swarm optimization techniques, and strategies combining hard and soft controls. In addition, the book: Includes a report on exciting new developments in prosthetic/robotic hand technology, with an emphasis on the fusion of hard and soft control strategies Covers both prosthetic and non-prosthetic hand designs for everything from routine human operations, robotic surgery, and repair and maintenance, to hazardous materials handling, space applications, explosives disposal, and more Provides a comprehensive overview of five-fingered robotic hand technology kinematics, dynamics, and control Features detailed coverage of important recent developments in neuroprosthetics Fusion of Hard and Soft Control Strategies for Robotic Hand is a must-read for researchers in control engineering, robotic engineering, biomedical sciences and engineering, and rehabilitation engineering.

Army R, D & A. - 1969

Implantable Sensor Systems for Medical Applications - Andreas Inmann 2013-01-02

Implantable sensor systems offer great potential for enhanced medical care and improved quality of life, consequently leading to major investment in this exciting field. Implantable sensor systems for medical applications provides a wide-ranging overview of the core technologies, key challenges and main issues related to the development and use of these devices in a diverse range of medical applications. Part one reviews the fundamentals of implantable systems, including materials and material-tissue interfaces, packaging and coatings, microassembly, electrode array design and fabrication, and the use of biofuel cells as sustainable power sources. Part two goes on to consider the challenges associated with implantable systems. Biocompatibility, sterilization considerations and the development of active implantable medical devices in a regulated environment are discussed, along with issues regarding data protection and patient privacy in medical sensor networks. Applications of implantable systems are then discussed in part

three, beginning with Microelectromechanical systems (MEMS) for in-vivo applications before further exploration of tripolar interfaces for neural recording, sensors for motor neuroprostheses, implantable wireless body area networks and retina implants. With its distinguished editors and international team of expert contributors, Implantable sensor systems for medical applications is a comprehensive guide for all those involved in the design, development and application of these life-changing technologies. Provides a wide-ranging overview of the core technologies, key challenges and main issues related to the development and use of implantable sensor systems in a range of medical applications Reviews the fundamentals of implantable systems, including materials and material-tissue interfaces, packaging and coatings, and microassembly Considers the challenges associated with implantable systems, including biocompatibility and sterilization

Robotics - Oliver Brock 2009

State-of-the-art robotics research on such topics as manipulation, motion planning, micro-robotics, distributed systems, autonomous navigation, and mapping. Robotics: Science and Systems IV spans a wide spectrum of robotics, bringing together researchers working on the foundations of robotics, robotics applications, and analysis of robotics systems. This volume presents the proceedings of the fourth annual Robotics: Science and Systems conference, held in 2008 at the Swiss Federal Institute of Technology in Zurich. The papers presented cover a range of topics, including computer vision, mapping, terrain identification, distributed systems, localization, manipulation, collision avoidance, multibody dynamics, obstacle detection, microrobotic systems, pursuit-evasion, grasping and manipulation, tracking, spatial kinematics, machine learning, and sensor networks as well as such applications as autonomous driving and design of manipulators for use in functional-MRI. The conference and its proceedings reflect not only the tremendous growth of robotics as a discipline but also the desire in the robotics community for a flagship event at which the best of the research in the field can be presented.

Handbook of Neurological Rehabilitation - Richard J. Greenwood 2005-08-16

Provides an invaluable resource for all professions that work with patients suffering from neurological disorders.

Proceedings of the Annual International Conference of the IEEE Engineering in Medicine and Biology Society - IEEE Engineering in Medicine and Biology Society. Conference 1988