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KEY=REHABILITATION - THOMAS ADRIENNE

Biomechatronics in Medical Rehabilitation Biomodelling, Interface, and Control Springer This book focuses on the key technologies in developing biomechatronic systems for medical rehabilitation purposes. It includes a detailed analysis of biosignal processing, biomechanics modelling, neural and muscular interfaces, artificial actuators, robot-assisted training, clinical setup/implementation and rehabilitation robot control. Encompassing highly multidisciplinary themes in the engineering and medical fields, it presents researchers' insights into the emerging technologies and developments that are being utilized in biomechatronics for medical purposes. Presenting a detailed analysis of five key areas in rehabilitation robotics: (i) biosignal processing; (ii) biomechanics modelling; (iii) neural and muscular interfaces; (iv) artificial actuators and devices; and (v) the use of neurological and muscular interfaces in rehabilitation robots control, the book describes the design of biomechatronic systems, the methods and control systems used and the implementation and testing in order to show how they fulfil the needs of that specific area of rehabilitation. Providing a comprehensive overview of the background of biomechatronics and details of new advances in the field, it is especially useful for researchers, academics and graduates new to the field of biomechatronics engineering, and is also of interest to researchers and clinicians in the medical field who are not engineers. **Telehealth and Mobile Health CRC Press** The E-Medicine, E-Health, M-Health, Telemedicine, and Telehealth Handbook provides extensive coverage of modern telecommunication in the medical industry, from sensors on and within the body to electronic medical records and beyond. Telehealth and Mobile Health is the second volume of this handbook. Featuring chapters written by leading experts and researchers in their respective fields, this volume: Discusses telesurgery, medical robotics, and image guidance as well as telenursing and remote patient care Describes the implementation of networks, data management, record management, and effective personnel training Explains how the use of new technologies brings many business, management, and service opportunities Provides examples of scientific advancements such as brain-controlled bionic human arms and hands Incorporates clinical applications throughout for practical reference The E-Medicine, E-Health, M-Health, Telemedicine, and Telehealth Handbook bridges the gap between scientists, engineers, and medical professionals by creating synergy in the related fields of biomedical engineering, information and communication technology, business, and healthcare. **Brain-Computer Interfaces Principles and Practice OUP USA** In the last 15 years, a recognizable surge in the field of Brain Computer Interface (BCI) research and development has emerged. This emergence has sprung from a variety of factors. For one, inexpensive computer hardware and software is now available and can support the complex high-speed analyses of brain activity that is essential is BCI. Another factor is the greater understanding of the central nervous system including the abundance of new information on the nature and functional correlates of brain signals and improved methods for recording these signals in both the short-term and long-term. And the third, and perhaps most significant factor, is the new recognition of the needs and abilities of people disabled by disorders such as cerebral palsy, spinal cord injury, stroke, amyotrophic lateral sclerosis (ALS), multiple sclerosis, and muscular dystrophies. The severely disabled are now able to live for many years and even those with severely limited voluntary muscle control can now be given the most basic means of communication and control because of the recent advances in the technology, research, and applications of BCI. This book is intended to provide an introduction to and summary of essentially all major aspects of BCI research and development. Its goal is to be a comprehensive, balanced, and coordinated presentation of the field's key principles, current practice, and future prospects. **Bioelectronics and Medical Devices From Materials to Devices - Fabrication, Applications and Reliability Woodhead Publishing** Bioelectronics and Medical Devices: From Materials to Devices-Fabrication, Applications and Reliability reviews the latest research on electronic devices used in the healthcare sector, from materials, to applications, including biosensors, rehabilitation devices, drug delivery devices, and devices based on wireless technology. This information is presented from the unique interdisciplinary perspective of the editors and contributors, all with materials science, biomedical engineering, physics, and chemistry backgrounds. Each applicable chapter includes a discussion of these devices, from materials and fabrication, to reliability and technology applications. Case studies, future research directions and recommendations for additional readings are also included. The book addresses hot topics, such as the latest, state-of the-art biosensing devices that have the ability for early detection of life-threatening diseases, such as tuberculosis, HIV and cancer. It covers rehabilitation devices and advancements, such as the devices that could be utilized by advanced-stage ALS patients to improve their interactions with the environment. In addition, electronic controlled delivery systems are reviewed, including those that are based on artificial intelligences. Presents the latest topics, including MEMS-based fabrication of biomedical sensors, Internet of Things, certification of medical and drug delivery devices, and electrical safety considerations Presents the interdisciplinary perspective of materials scientists, biomedical engineers, physicists and chemists on biomedical electronic devices Features systematic coverage in each chapter, including recent advancements in the field, case studies, future research directions, and recommendations for additional readings **Neurorehabilitation Technology Springer** This revised, updated second edition provides an accessible, practical overview of major areas of technical development and clinical application in the field of neurorehabilitation movement therapy. The initial section provides a rationale for technology application in movement therapy by summarizing recent findings in neuroplasticity and motor learning. The following section then explains the state of the art in human-machine interaction requirements for clinical rehabilitation practice. Subsequent sections describe the ongoing revolution in robotic therapy for upper extremity movement and for walking, and then describe other emerging technologies including electrical stimulation, virtual reality, wearable sensors, and brain-computer interfaces. The promises and limitations of these technologies in neurorehabilitation are discussed. Throughout the book the chapters provide detailed practical information on state-of-the-art clinical applications of these devices following stroke, spinal cord injury, and other neurologic disorders. The text is illustrated throughout with photographs and schematic diagrams which serve to clarify the information for the reader. Neurorehabilitation Technology, Second Edition is a valuable resource for neurologists, biomedical engineers, roboticists, rehabilitation specialists, physiotherapists, occupational therapists and those training in these fields. **Human-Computer Interaction. Interaction Platforms and Techniques 18th International Conference, HCI International 2016, Toronto, ON, Canada, July 17-22, 2016. Proceedings, Part II Springer** The 3-volume set LNCS 9731, 9732, and 9733 constitutes the refereed proceedings of the 18th International Conference on Human-Computer Interaction, HCII 2016, held in Toronto, ON, Canada, in July 2016. The total of 1287 papers and 186 posters presented at the HCII 2016 conferences and were carefully reviewed and selected from 4354 submissions. The papers thoroughly cover the entire field of Human-Computer Interaction, addressing major advances in knowledge and effective use of computers in a variety of application areas. The volumes constituting the full 27-volume set of the conference proceedings. **Emotion Recognition A Pattern Analysis Approach John Wiley & Sons Wearable Robotics Systems and Applications Academic Press Wearable Robotics: Systems and Applications** provides a comprehensive overview of the entire field of wearable robotics, including active orthotics (exoskeleton) and active prosthetics for the upper and lower limb and full body. In its two major sections, wearable robotics systems are described from both engineering perspectives and their application in medicine and industry. Systems and applications at various levels of the development cycle are presented, including those that are still under active research and development, systems that are under preliminary or full clinical trials, and those in commercialized products. This book is a great resource for anyone working in this field, including researchers, industry professionals and those who want to use it as a teaching mechanism. Provides a comprehensive overview of the entire field, with both engineering and medical perspectives Helps readers quickly and efficiently design and develop wearable robotics for healthcare applications **Haptic Interfaces for Accessibility, Health, and Enhanced Quality of Life Springer Nature** This book is the first resource to provide in-depth coverage on topical areas of assistive, rehabilitative, and health-related applications for haptic (touch-based) technologies. Application topics are grouped into thematic areas spanning haptic devices for sensory impairments, health and well-being, and physical impairments which are illustrated in this book. A diverse group of experts in the field were invited to contribute different chapters to provide complementary and multidisciplinary perspectives. Unlike other books on haptics, which focus on human haptic perception, specific modalities of haptics (e.g., realistic haptic rendering), or broadly cover the subfields of haptics, this book takes an application-oriented approach to present a tour of how the field of haptics has been advanced with respect to important, impactful thematic focuses. Under Theme 1 "Sensory Impairments", haptics technologies to support individuals with sensory impairments is presented which includes: Spatial awareness in sensory impairments through touch; Haptically-assisted interfaces for persons with visual impairments; and Enabling learning experiences for visually impaired children by interaction design. Under Theme 2 "Haptics for Health and Well-Being", haptics technologies aimed at supporting exercise and healthy aging will be covered including: Haptics in rehabilitation, exergames and health; Therapeutic haptics for mental health and well-being; and Applications of haptics in medicine. Under Theme 3 "Haptics for Physical Impairments", haptics technologies for enhancing the quality of life for individuals with weakened/impaired limbs or neurological diseases impacting movement is targeted including: Assistive soft exoskeletons with pneumatic artificial muscles; Haptics for accessibility in rehabilitative hardware; and intelligent robotics and immersive displays for enhancing haptic interaction in physical rehabilitation environments. Engineers, scientists, and researchers working in the areas of haptics, multimedia, virtual/augmented/mixed-reality, human-computer interaction, assistive technologies, rehabilitative technologies, healthcare technologies, and/or actuator design will want to purchase this book. Advanced level students and hobbyists interested in haptics will also be interested in this book. **Textbook of Neural Repair and Rehabilitation Cambridge University Press** Volume 1 of the Textbook of Neural Repair and Rehabilitation covers the basic sciences relevant to recovery of function following injury to the nervous system. **Interaction of BCI with the underlying neurological conditions in patients: pros and cons Frontiers Media SA** Nothing provided **Advances in Rehabilitation Robotics Human-friendly Technologies on Movement Assistance and Restoration for People with Disabilities Springer Science & Business** One of the major application targets of service robots is to use them as assistive devices for rehabilitation. This book introduces some latest achievements in the field of rehabilitation robotics and assistive technology for people with disabilities and aged people. The book contains results from both theoretical and experimental works and reviews on some new advanced rehabilitation devices which has been recently transferred to the industry. Significant parts of the book are devoted to the assessment of new rehabilitation technologies, the evaluation of

prototype devices with end-users, the safety of rehabilitation robots, and robot-assisted neurorehabilitation. The book is a representative selection of the latest trends in rehabilitation robotics and can be used as a reference for teaching on mechatronic devices for rehabilitation. Research Anthology on Rehabilitation Practices and Therapy IGI Global The availability of practical applications, techniques, and case studies by international therapists is limited despite expansions to the fields of clinical psychology, rehabilitation, and counseling. As dialogues surrounding mental health grow, it is important to maintain therapeutic modalities that ensure the highest level of patient-centered rehabilitation and care are met across global networks. Research Anthology on Rehabilitation Practices and Therapy is a vital reference source that examines the latest scholarly material on trends and techniques in counseling and therapy and provides innovative insights into contemporary and future issues within the field. Highlighting a range of topics such as psychotherapy, anger management, and psychodynamics, this multi-volume book is ideally designed for mental health professionals, counselors, therapists, clinical psychologists, sociologists, social workers, researchers, students, and social science academicians seeking coverage on significant advances in rehabilitation and therapy. Neurological Physical Therapy BoD – Books on Demand Physical therapy services may be provided alongside or in conjunction with other medical services. They are performed by physical therapists (known as physiotherapists in many countries) with the help of other medical professionals. This book consists of 12 chapters written by several professionals from different parts of the world. The book covers different subjects, such as the effects of physical therapy, motor imagery, neuroscience-based rehabilitation for neurological patients, and applications of robotics for stroke and cerebral palsy. We hope that this book will open up new directions for physical therapists in the field of neurological physical therapy. Machine Learning in Signal Processing Applications, Challenges, and the Road Ahead CRC Press Machine Learning in Signal Processing: Applications, Challenges, and the Road Ahead offers a comprehensive approach toward research orientation for familiarizing signal processing (SP) concepts to machine learning (ML). ML, as the driving force of the wave of artificial intelligence (AI), provides powerful solutions to many real-world technical and scientific challenges. This book will present the most recent and exciting advances in signal processing for ML. The focus is on understanding the contributions of signal processing and ML, and its aim to solve some of the biggest challenges in AI and ML. FEATURES Focuses on addressing the missing connection between signal processing and ML Provides a one-stop guide reference for readers Oriented toward material and flow with regards to general introduction and technical aspects Comprehensively elaborates on the material with examples and diagrams This book is a complete resource designed exclusively for advanced undergraduate students, post-graduate students, research scholars, faculties, and academicians of computer science and engineering, computer science and applications, and electronics and telecommunication engineering. Introduction to Neural Engineering for Motor Rehabilitation John Wiley & Sons Neural engineering is a discipline that uses engineering techniques to understand, repair, replace, enhance, or treat diseases of neural systems. Currently, no book other than this one covers this broad range of topics within motor rehabilitation technology. With a focus on cutting edge technology, it describes state-of-the-art methods within this field, from brain-computer interfaces to spinal and cortical plasticity. Touching on electrode design, signal processing, the neurophysiology of movement, robotics, and much more, this innovative volume collects the latest information for a wide range of readers working in biomedical engineering. Intelligent Assistive Technologies for Dementia Clinical, Ethical, Social, and Regulatory Implications Oxford University Press, USA The financial burden and the level of specialized care required to look after older adults with dementia has reached the point of a public health crisis. Older adults diagnosed and living with the disorder reached 35.6 million worldwide in 2010 and is expected to increase to 135.5 million in 2050, with costs soaring to $1.1 trillion. In the face of the increasing burden this disorder poses to health care systems and the management of this patient population, intelligent assistive technologies (IATs) represent a remarkable and promising strategy to meet the need of persons suffering from dementia. These technologies aim at helping individuals compensate for specific physical and cognitive deficits, and maintain a higher level of independence at home and in everyday activities. However, the rapid development and widespread implementation of these technologies are not without associated challenges at multiple levels. An international and multidisciplinary group of authors provide future-oriented and in-depth analysis of IATs. Part I delineates the current landscape of intelligent assistive technologies for dementia care and age-related disability from a global perspective, while the contributions in Part II analyze and address the major psycho-social implications linked to the development and clinical use of IATs. In the last section, essays examine the major ethical, social and regulatory issues associated with the use of IATs in dementia care. This volume provides an authoritative and comprehensive overview of how IATs are reshaping dementia care. Application of Biomedical Engineering in Neuroscience Springer Nature This book focuses on interdisciplinary research in the field of biomedical engineering and neuroscience. Biomedical engineering is a vast field, ranging from bioengineering to brain-computer interfaces. The book explores the system-level function and dysfunction of the nervous system from scientific and engineering perspectives. The initial sections introduce readers to the physiology of the brain, and to the biomedical tools needed for diagnostics and effective therapies for various neurodegenerative and regenerative disorders. In turn, the book summarizes the biomedical interventions that are used to understand the neural mechanisms underlying empathy disorders, and reviews recent advances in biomedical engineering for rehabilitation in connection with neurodevelopmental disorders and brain injuries. Lastly, the book discusses innovations in machine learning and artificial intelligence for computer-aided disease diagnosis and treatment, as well as applications of nanotechnology in therapeutic neurology. Advanced Technologies in Rehabilitation Empowering Cognitive, Physical, Social and Communicative Skills Through Virtual Reality, Robots, Wearable Systems and Brain-computer Interfaces IOS Press The goal of this book is to bring together ideas from several different disciplines in order to examine the focus and aims that drive rehabilitation intervention and technology development. Specifically, the chapters in this book address the questions of what research is currently taking place to further develop rehabilitation, applied technology and how we have been able to modify and measure responses in both healthy and clinical populations using these technologies. Machine Medical Ethics Springer The essays in this book, written by researchers from both humanities and science, describe various theoretical and experimental approaches to adding medical ethics to a machine, what design features are necessary in order to achieve this, philosophical and practical questions concerning justice, rights, decision-making and responsibility in medical contexts, and accurately modeling essential physician-machine-patient relationships. In medical settings, machines are in close proximity with human beings: with patients who are in vulnerable states of health, who have disabilities of various kinds, with the very young or very old and with medical professionals. Machines in these contexts are undertaking important medical tasks that require emotional sensitivity, knowledge of medical codes, human dignity and privacy. As machine technology advances, ethical concerns become more urgent: should medical machines be programmed to follow a code of medical ethics? What theory or theories should constrain medical machine conduct? What design features are required? Should machines share responsibility with humans for the ethical consequences of medical actions? How ought clinical relationships involving machines to be modeled? Is a capacity for empathy and emotion detection necessary? What about consciousness? This collection is the first book that addresses these 21st-century concerns. 2021 10th International IEEE EMBS Conference on Neural Engineering (NER) Members of the Neuroscience, Engineering and Bioethics Communities are encouraged to attend this highly multidisciplinary meeting The conference will highlight emerging neurotechnologies for the restoration and enhancement of impaired sensory, motor, and cognitive functions, novel engineering tools for elucidating brain function, and discussions on the ethics of neurotechnology use and adoption by impaired and healthy individuals Brain-Computer Interfaces Elsevier Brain-Computer Interfacing, Volume 168, not only gives readers a clear understanding of what BCI science is currently offering, but also describes future expectations for restoring lost brain function in patients. In-depth technological chapters are aimed at those interested in BCI technologies and the nature of brain signals, while more comprehensive summaries are provided in the more applied chapters. Readers will be able to grasp BCI concepts, understand what needs the technologies can meet, and provide an informed opinion on BCI science. Explores how many different causes of disability have similar functional consequences (loss of mobility, communication etc.) Addresses how BCI can be of use Presents a multidisciplinary review of BCI technologies and the opportunities they provide for people in need of a new kind of prosthetic Offers a comprehensive, multidisciplinary review of BCI for researchers in neuroscience and traumatic brain injury that is also ideal for clinicians in neurology and neurosurgery The Tobacco Keeper A&C Black First published in Arabic in 2008, The Tobacco Keeper relates the investigation of the life of a celebrated Jewish Iraqi musician who was expelled to Israel in the 1950s. Having returned to Iraq, via Iran, the musician is thrown out as an Israeli spy. Returning for the third time under a forged passport, he is murdered in mysterious circumstances. Arriving in Baghdad's Green Zone during the US-led occupation, a journalist writing a story about the musician's life discovers an underworld of fake identities, mafias and militias. Even among the journalists, there is a secret world of identity games, fake names and ulterior motives. Smart Wheelchairs and Brain-computer Interfaces Mobile Assistive Technologies Academic Press Smart Wheelchairs and Brain-Computer Interfaces: Mobile Assistive Technologies combines the fields of neuroscience, rehabilitation and robotics via contributions from experts in their field to help readers develop new mobile assistive technologies. It provides information on robotics, control algorithm design for mobile robotics systems, ultrasonic and laser sensors for measurement and trajectory planning, and is ideal for researchers in BCI. A full view of this new field is presented, giving readers the current research in the field of smart wheelchairs, potential control mechanisms and human interfaces that covers mobility, particularly powered mobility, smart wheelchairs, particularly sensors, control mechanisms, and human interfaces. Presents the first book that combines BCI and mobile robotics Focuses on fundamentals and developments in assistive robotic devices which are commanded by alternative ways, such as the brain Provides an overview of the technologies that are already available to support research and the development of new products Exoskeletons in Rehabilitation Robotics Tremor Suppression Springer Science & Business Media The new technological advances opened widely the application field of robots. Robots are moving from the classical application scenario with structured industrial environments and tedious repetitive tasks to new application environments that require more interaction with the humans. It is in this context that the concept of Wearable Robots (WRs) has emerged. One of the most exciting and challenging aspects in the design of biomechatronics wearable robots is that the human takes a place in the design, this fact imposes several restrictions and requirements in the design of this sort of devices. The key distinctive aspect in wearable robots is their intrinsic dual cognitive and physical interaction with humans. The key role of a robot in a physical human–robot interaction (pHRI) is the generation of supplementary forces to empower and overcome human physical limits. The crucial role of a cognitive human–robot interaction (cHRI) is to make the human aware of the possibilities of the robot while allowing them to maintain control of the robot at all times. This book gives a general overview of the robotics exoskeletons and introduces the reader to this robotic field. Moreover, it describes the development of an upper limb exoskeleton for tremor suppression in order to illustrate the influence of a specific application in the designs decisions. Emerging Therapies in Neurorehabilitation Springer Science & Business Media This book reports on the latest technological and clinical advances in the field of neurorehabilitation. It is, however, much more than a conventional survey of the state-of-the-art in neurorehabilitation technologies and therapies. It was formed on the basis of a week of lively discussions between curious PhD students and leading research experts during the summer school on neurorehabilitation (SSNR2012), September 16-21 in Nuévalos, Zaragoza (Spain). Its unconventional format makes it a perfect guide for all PhD students, researchers and professionals interested in gaining a multidisciplinary perspective on current and future neurorehabilitation scenarios. The book covers various aspects of neurorehabilitation research and practice, organized into different parts. The first part discusses a selection of common impairments affecting brain function, such as stroke, cerebral palsy and Parkinson's disease; the second deals with both spinal cord and brain plasticity. The third part covers the most recent rehabilitation and diagnostics technologies, including robotics, neuroprostheses, brain-machine interfaces and electromyography systems. Practical examples and case studies related to the application of some of the latest techniques in realistic clinical scenarios are covered in the fourth part. Bioengineering and Biomedical Signal and Image Processing First International Conference, BIOMESIP

2021, Meloneras, Gran Canaria, Spain, July 19-21, 2021, Proceedings Springer Nature This book constitutes the refereed proceedings of the First International Conference on Bioengineering and Biomedical Signal and Image Processing, BIOMESIP 2021, held in Meloneras, Gran Canaria, Spain, in July 2021. The 41 full and 5 short papers were carefully reviewed and selected from 121 submissions. The papers are grouped in topical issues on biomedical applications in molecular, structural, and functional imaging; biomedical computing; biomedical signal measurement, acquisition and processing; computerized medical imaging and graphics; disease control and diagnosis; neuroimaging; pattern recognition and machine learning for biosignal data; personalized medicine; and COVID-19. Digital Transformation Springer With the exception of written letters and personal conversations, digital technology forms the basis of nearly every means of communication and information that we use today. It is also used to control the essential elements of economic, scientific, and public and private life: security, production, mobility, media, and healthcare. Without exaggerating it is possible to say that digital technology has become one of the foundations of our technologically oriented civilization. The benefits of modern data technology are so impressive and the potential for future applications so enormous that we cannot fail to promote its development if we are to retain our leading role in the competitive international marketplace. In this process, security plays a vital role in each of the areas of application of digital technology — the more technological sectors are entrusted to data systems technology, the more important their reliability becomes to us. Developing digital systems further while simultaneously ensuring that they always act and respond in the best interests of people is a central goal of the technological research and development propagated and conducted by Fraunhofer. Robotics in Healthcare Field Examples and Challenges Springer The work is a collection of contributions resulting from R&D efforts originated from scientific projects involving academia, technological partners, and end-user institutions. The aim is to provide a comprehensive overview of robotics technology applied to Healthcare, and discuss the anticipation of upcoming challenges. The intersection of Robotics and Medicine includes socially and economically relevant areas, such as rehabilitation, therapy, and healthcare. Innovative usages of current robotics technologies are being somewhat stranded by concerns related to social dynamics. The examples covered in this volume show some of the potential societal benefits robotics can bring and how the robots are being integrated in social environments. Despite the aforementioned concerns, a fantastic range of possibilities is being opened. The current trend in social robotics adds to technology challenges and requires R&D to think about Robotics as an horizontal discipline, intersecting social and exact sciences. For example, robots that can act as if they have credible personalities (not necessarily similar to humans) living in social scenarios, eventually helping people. Also, robots can move inside the human body to retrieve information that otherwise is difficult to obtain. The decision autonomy of these robots raises a broad range of subjects though the immediate advantages of its use are evident. The book presents examples of robotics technologies tested in healthcare environments or realistically close to being deployed in the field and discusses the challenges involved. Chapter 1 provides a comprehensive overview of Healthcare robotics and points to realistically expectable developments in the near future. Chapter 2 describes the challenges deploying a social robot in the Pediatrics ward of an Oncological hospital for simple edutainment activities. Chapter 3 focuses on Human-Robot Interaction techniques and their role in social robotics. Chapter 4 focus on R&D efforts behind an endoscopic capsule robot. Chapter 5 addresses experiments in rehabilitation with orthotics and walker robots. These examples have deep social and economic relations with the Healthcare field, and, at the same time, are representative of the R&D efforts the robotics community is developing. Towards Practical Brain-Computer Interfaces Bridging the Gap from Research to Real-World Applications Springer Science & Business Media Brain-computer interfaces (BCIs) are devices that enable people to communicate via thought alone. Brain signals can be directly translated into messages or commands. Until recently, these devices were used primarily to help people who could not move. However, BCIs are now becoming practical tools for a wide variety of people, in many different situations. What will BCIs in the future be like? Who will use them, and why? This book, written by many of the top BCI researchers and developers, reviews the latest progress in the different components of BCIs. Chapters also discuss practical issues in an emerging BCI enabled community. The book is intended both for professionals and for interested laypeople who are not experts in BCI research. Ethics of Artificial Intelligence Oxford University Press, USA Should a self-driving car prioritize the lives of the passengers over the lives of pedestrians? Should we as a society develop autonomous weapon systems that are capable of identifying and attacking a target without human intervention? What happens when AIs become smarter and more capable than us? Could they have greater than human moral status? Can we prevent superintelligent AIs from harming us or causing our extinction? At a critical time in this fast-moving debate, thirty leading academics and researchers at the forefront of AI technology development come together to explore these existential questions, including Aaron James (UC Irvine), Allan Dafoe (Oxford), Andrea Loreggia (Padova), Andrew Critch (UC Berkeley), Azim Shariff (Univ. . Real-Time BCI System Design to Control Arduino Based Speed Controllable Robot Using EEG Springer This book discusses the basic requirements and constraints in building a brain–computer interaction system. These include the technical requirements for building the signal processing module and the acquisition module. The major aspects to be considered when designing a signal acquisition module for a brain–computer interaction system are the human brain, types and applications of brain–computer systems, and the basics of EEG (electroencephalogram) recording. The book also compares the algorithms that have been and that can be used to design the signal processing module of brain–computer interfaces, and describes the various EEG-acquisition devices available and compares their features and inadequacies. Further, it examines in detail the use of Emotiv EPOC (an EEG acquisition module developed by Emotiv) to build a complete brain–computer interaction system for driving robots using a neural network classification module. Rehabilitation Robotics Technology and Application Academic Press Rehabilitation Robotics gives an introduction and overview of all areas of rehabilitation robotics, perfect for anyone new to the field. It also summarizes available robot technologies and their application to different pathologies for skilled researchers and clinicians. The editors have been involved in the development and application of robotic devices for neurorehabilitation for more than 15 years. This experience using several commercial devices for robotic rehabilitation has enabled them to develop the know-how and expertise necessary to guide those seeking comprehensive understanding of this topic. Each chapter is written by an expert in the respective field, pulling in perspectives from both engineers and clinicians to present a multi-disciplinary view. The book targets the implementation of efficient robot strategies to facilitate the re-acquisition of motor skills. This technology incorporates the outcomes of behavioral studies on motor learning and its neural correlates into the design, implementation and validation of robot agents that behave as 'optimal' trainers, efficiently exploiting the structure and plasticity of the human sensorimotor systems. In this context, human-robot interaction plays a paramount role, at both the physical and cognitive level, toward achieving a symbiotic interaction where the human body and the robot can benefit from each other's dynamics. Provides a comprehensive review of recent developments in the area of rehabilitation robotics Includes information on both therapeutic and assistive robots Focuses on the state-of-the-art and representative advancements in the design, control, analysis, implementation and validation of rehabilitation robotic systems Trends in Intelligent Robotics, Automation, and Manufacturing First International Conference, IRAM 2012, Kuala Lumpur, Malaysia, November 28-30, 2012, Proceedings Springer This book constitutes the proceedings of the First International Conference on Intelligent Robotics and Manufacturing, IRAM 2012, held in Kuala Lumpur, Malaysia, in November 2012. The 64 revised full papers included in this volume were carefully reviewed and selected from 102 initial submissions. The papers are organized in topical sections named: mobile robots, intelligent autonomous systems, robot vision and robust, autonomous agents, micro, meso and nano-scale automation and assembly, flexible manufacturing systems, CIM and micro-machining, and fabrication techniques. Brain-Computer Interfaces Applying our Minds to Human-Computer Interaction Springer Science & Business Media For generations, humans have fantasized about the ability to create devices that can see into a person's mind and thoughts, or to communicate and interact with machines through thought alone. Such ideas have long captured the imagination of humankind in the form of ancient myths and modern science fiction stories. Recent advances in cognitive neuroscience and brain imaging technologies have started to turn these myths into a reality, and are providing us with the ability to interface directly with the human brain. This ability is made possible through the use of sensors that monitor physical processes within the brain which correspond with certain forms of thought. Brain-Computer Interfaces: Applying our Minds to Human-Computer Interaction broadly surveys research in the Brain-Computer Interface domain. More specifically, each chapter articulates some of the challenges and opportunities for using brain sensing in Human-Computer Interaction work, as well as applying Human-Computer Interaction solutions to brain sensing work. For researchers with little or no expertise in neuroscience or brain sensing, the book provides background information to equip them to not only appreciate the state-of-the-art, but also ideally to engage in novel research. For expert Brain-Computer Interface researchers, the book introduces ideas that can help in the quest to interpret intentional brain control and develop the ultimate input device. It challenges researchers to further explore passive brain sensing to evaluate interfaces and feed into adaptive computing systems. Most importantly, the book will connect multiple communities allowing research to leverage their work and expertise and blaze into the future. Aging between Participation and Simulation Ethical Dimensions of Socially Assistive Technologies in Elderly Care Walter de Gruyter GmbH & Co KG With increasing urgency, decisions about the digitalized future of healthcare and implementations of new assistive technologies are becoming focal points of societal and scientific debates and addresses large audiences. Decisions require a careful weighing of risks and benefits and contextualizing in-depth ethical analysis with robust empirical data. However, up to now, research on social assistive technologies is mostly dispersed over different academic fields and disciplines. A comprehensive overview on discussions regarding values at stake and ethical assessment of recent developments especially in healthcare is largely missing. This publication initiates an interdisciplinary discourse on ethical, legal and social implications of socially assistive technologies in healthcare. Contributions include perspectives from nursing science, social sciences, philosophy, medical ethics, economics and law to present an – to our knowledge – first and comprehensive overview on different aspects of the use and implementation of socially assistive technologies from an ethical perspective. It combines practically relevant insights and examples from current research and development with ethical analysis to uncover exemplary moral tipping points between promotion of participation or well-being and risks and damages to these values. Healthcare professionals involved in implementation of smart technologies as well as scholars from the field of humanities, nursing and medicine, interested in the discussions on ethics and technology in healthcare, will benefit from this new contribution. The publication is part of the international DigitAs conference "Aging between Participation and Simulation – Ethical Dimensions of Socially Assistive Technologies" held at the Institute of Medical Ethics and History of Medicine (Ruhr University Bochum) from 4 February to 8 February 2019. Within this framework, twelve young scholars were invited to discuss their contributions with renowned experts in the field. The Institute of Medical Ethics and History of Medicine is one of the leading institutes in empirically informed ethical analysis in healthcare and medicine and is a member of the European Association of Centres of Medical Ethics (EACME). Brain-Computer Interface Systems Recent Progress and Future Prospects BoD – Books on Demand Brain-Computer Interface (BCI) systems allow communication based on a direct electronic interface which conveys messages and commands directly from the human brain to a computer. In the recent years, attention to this new area of research and the number of publications discussing different paradigms, methods, signal processing algorithms, and applications have been increased dramatically. The objective of this book is to discuss recent progress and future prospects of BCI systems. The topics discussed in this book are: important issues concerning end-users; approaches to interconnect a BCI system with one or more applications; several advanced signal processing methods (i.e., adaptive network fuzzy inference systems, Bayesian sequential learning, fractal features and neural networks, autoregressive models of wavelet bases, hidden Markov models, equivalent current dipole source localization, and independent component analysis); review of hybrid and wireless techniques used in BCI systems; and applications of BCI systems in epilepsy treatment and emotion detections. Cyber-Humans Our Future with Machines Springer It is predicted that robots will surpass human intelligence within the next fifty years. The ever increasing speed of advances in technology and neuroscience, coupled with the creation of super computers and enhanced body parts and artificial limbs, is paving the way for a merger of

both human and machine. Devices which were once worn on the body are now being implanted into the body, and as a result, a class of true cyborgs, who are displaying a range of skills beyond those of normal humans-beings, are being created. There are cyborgs which can see colour by hearing sound, others have the ability to detect magnetic fields, some are equipped with telephoto lenses to aid their vision or implanted computers to monitor their heart, and some use thought to communicate with a computer or to manipulate a robotic arm. This is not science-fiction, these are developments that are really happening now, and will continue to develop in the future. However, a range of legal and policy questions has arisen alongside this rise of artificial intelligence. Cyber-Humans provides a deep and unique perspective on the technological future of humanity, and describes how law and policy will be particularly relevant in creating a fair and equal society and protecting the liberties of different life forms which will emerge in the 21st century. Dr Woodrow (Woody) Barfield previously headed up the Sensory Engineering Laboratory, holding the position of Industrial and Systems Engineering Professor at the University of Washington. His research revolves around the design and use of wearable computers and augmented reality systems and holds both JD and LLM degrees in intellectual property law and policy. He has published over 350 articles and major presentations in the areas of computer science, engineering and law. He currently lives in Chapel Hill, NC, USA. Social Robotics Second International Conference on Social Robotics, ICSR 2010, Singapore, November 23-24, 2010. Proceedings Springer Science & Business Media The papers in this volume were the fruitful scientific results of the Second International Conference on Social Robotics (ICSR), held during November 23–24, 2010 in Singapore, which was jointly organized by the Social Robotics Laboratory (SRL), Interactive Digital Media Institute (IDMI), the National University of Singapore and 2 Human Language Technology Department, the Institute for Infocomm Research (I R), A*STAR, Singapore. These papers address a range of topics in social robotics and its applications. We received paper submissions from America, Asia, and Europe. All the papers were reviewed by at least three referees from the 32-member Program Committee who were assembled from the global community of social robotics researchers. This v- ume contains the 42 papers that were selected to report on the latest developments and studies of social robotics in the areas of human--robot interaction; affective and cognitive sciences for interactive robots; design philosophies and software archit- tures for robots; learning, adaptation and evolution of robotic intelligence; and mec- tronics and intelligent control. The Impact of Virtual and Augmented Reality on Individuals and Society Frontiers Media SA