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KEY=PRO - SIERRA JACOBY

Robotics in STEM Education

Redesigning the Learning Experience

Springer This book describes recent approaches in advancing STEM education with the use of robotics, innovative methods in integrating robotics in school subjects, engaging and stimulating students with robotics in classroom-based and out-of-school activities, and new ways of using robotics as an educational tool to provide diverse learning experiences. It addresses issues and challenges in generating enthusiasm among students and revamping curricula to provide application focused and hands-on approaches in learning . The book also provides effective strategies and emerging trends in using robotics, designing learning activities and how robotics impacts the students' interests and achievements in STEM related subjects. The frontiers of education are progressing very rapidly. This volume brought together a collection of projects and ideas which help us keep track of where the frontiers are moving. This book ticks lots of contemporary boxes: STEM, robotics, coding, and computational thinking among them. Most educators interested in the STEM phenomena will find many ideas in this book which challenge, provide evidence and suggest solutions related to both pedagogy and content. Regular reference to 21st Century skills, achieved through active collaborative learning in authentic contexts, ensures the enduring usefulness of this volume. John Williams Professor of Education and Director of the STEM Education Research Group Curtin University, Perth, Australia

Industrial robots and cobots

Everything you need to know about your future co-worker

Michał Gurgul In the modern world, highly repetitive and tiresome tasks are being delegated to machines. The demand for industrial robots is growing not only because of the need to improve production efficiency and the quality of the end products, but also due to rising employment costs and a shortage of skilled professionals. The industrial robot market is projected to grow by 16% year-on-year in the immediate future. The industry's progressing automation is increasing the demand for specialists who can operate robots. If you would like to join this sought-after and well-paid professional group, it's time to learn how to operate and program robots using modern methods. This book provides all the information you will need to enter the industry without spending money on training or looking for someone willing to introduce you to the world of robotics. You will learn about all aspects of programming and implementing robots in a company. The book consists of four parts: general introduction to robotics for non-technical people; part two describes industry robotisation; part three depicts the principles and methods of programming robots; the final part touches upon the safety of industrial robots and cobots. Are you a student of a technical faculty, or even a manager of a plant who would like to robotise production? If you are interested in this subject, you won't find a better book!

Biomimetic and Biohybrid Systems

4th International Conference, Living Machines 2015, Barcelona, Spain, July 28 - 31, 2015, Proceedings

Springer This book constitutes the proceedings of the 4th International Conference on Biomimetic and Biohybrid Systems, Living Machines 2015, held in Barcelona, Spain, in July 2015. The 34 full and 13 short papers presented in this volume were carefully reviewed and selected from 50 submissions. The themes they deal with are: locomotion, particularly for soft-bodies; novel sensing and autonomous control systems; and cognitive architectures, social robots, and human-robot interaction.

Modern Robotics

Cambridge University Press A modern and unified treatment of the mechanics, planning, and control of robots, suitable for a first course in robotics.

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Collaborative Networks and Digital Transformation

20th IFIP WG 5.5 Working Conference on Virtual Enterprises, PRO-VE 2019, Turin, Italy, September 23–25, 2019, Proceedings

Springer Nature This book constitutes the refereed proceedings of the 20th IFIP WG 5.5 Working Conference on Virtual Enterprises, PRO-VE 2019, held in Turin, Italy, in September 2019. The 56 revised full papers were carefully reviewed and selected from 141 submissions. They provide a comprehensive overview of major challenges and recent advances in various domains related to the digital transformation and collaborative networks and their applications with a strong focus on the following areas related to the main theme of the conference: collaborative models, platforms and systems for digital revolution; manufacturing ecosystem and collaboration in Industry 4.0; big data analytics and intelligence; risk, performance, and uncertainty in collaborative networked systems; semantic data/service discovery, retrieval, and composition in a collaborative networked world; trust and sustainability analysis in collaborative networks; value creation and social impact of collaborative networks on the digital revolution; technology development platforms supporting collaborative systems; collective intelligence and collaboration in advanced/emerging applications; and collaborative manufacturing and factories of the future, e-health and care, food and agribusiness, and crisis/disaster management.

The Coming Robot Revolution

Expectations and Fears About Emerging Intelligent, Humanlike Machines

Springer Science & Business Media Making a robot that looks and behaves like a human being has been the subject of many popular science fiction movies and books. Although the development of such a robot faces many challenges, the making of a virtual human has long been potentially possible. With recent advances in various key technologies related to hardware and software, the making of humanlike robots

is increasingly becoming an engineering reality. Development of the required hardware that can perform humanlike functions in a lifelike manner has benefitted greatly from development in such technologies as biologically inspired materials, artificial intelligence, artificial vision, and many others. Producing a humanlike robot that makes body and facial expressions, communicates verbally using extensive vocabulary, and interprets speech with high accuracy is extremely complicated to engineer. Advances in voice recognition and speech synthesis are increasingly improving communication capabilities. In our daily life we encounter such innovations when we call the telephone operators of most companies today. As robotics technology continues to improve we are approaching the point where, on seeing such a robot, we will respond with "Wow, this robot looks unbelievably real!" just like the reaction to an artificial flower. The accelerating pace of advances in related fields suggests that the emergence of humanlike robots that become part of our daily life seems to be imminent. These robots are expected to raise ethical concerns and may also raise many complex questions related to their interaction with humans.

RioBotz Combat Robot Tutorial

Createspace Independent Publishing Platform Combat robotics is a sport that is practiced world-wide. It attracts all kinds of participants, especially people interested in technology, engineering, machine design, computer science, new technologies and their trends. The competitions involve one-on-one duels between radio-controlled robotic vehicles in a bulletproof arena. RioBotz is the Robotic Competition team from the Pontifical Catholic University of Rio de Janeiro, Brazil. The team is formed by control, mechanical and electrical engineering undergraduate students from the University. This 374-page tutorial tries to summarize the knowledge learned and developed by the team since its creation in 2003. It includes the information on competing as well as designing and building combat robots. This tutorial also includes build reports from all combat robots from RioBotz, including detailed drawings and photos, totaling almost 900 figures.

PC Mag

PCMag.com is a leading authority on technology, delivering Labs-based, independent reviews of the latest products and services. Our expert industry analysis and practical solutions help you make better buying decisions and get more from technology.

Research and Education in Robotics - EUROBOT 2011

International Conference, Prague, Czech Republic, June 15-17, 2011. Proceedings

Springer Science & Business Media This book constitutes the proceedings of the International Conference on Research and Education in Robotics, EUROBOT 2011, held in Prague, Czech Republic, in June 2011. The 28 revised full papers presented were carefully reviewed and selected from numerous submissions. The papers present current basic research such as robot control and behaviour, applications of autonomous intelligent robots, and perception, processing and action; as well as educationally oriented papers addressing issues like robotics at school and at university, practical educational robotics activities, practices in educational robot design, and future pedagogical activities.

Programming Robots with ROS

A Practical Introduction to the Robot Operating System

"O'Reilly Media, Inc." Want to develop novel robot applications, but don't know how to write a mapping or object-recognition system? You're not alone, but you're certainly not without help. By combining real-world examples with valuable knowledge from the Robot Operating System (ROS) community, this practical book provides a set of motivating recipes for solving specific robotics use cases. Ideal for enthusiasts, from students in robotics clubs to professional robotics scientists and engineers, each recipe describes a complete solution using ROS open source libraries and tools. You'll learn how to complete tasks described in the recipes, as well as how to configure and recombine components for other tasks. If you're familiar with Python, you're ready to go. Learn fundamentals, including key ROS concepts, tools, and patterns Program robots that perform an increasingly complex set of behaviors, using the powerful packages in ROS See how to easily add perception and navigation abilities to your robots Integrate your own sensors, actuators, software libraries, and even a whole robot into the ROS ecosystem Learn tips and tricks for using ROS tools and community resources, debugging robot

behavior, and using C++ in ROS

Robotic Fabrication in Architecture, Art and Design 2014

Springer Science & Business Media Robotic automation has become ubiquitous in the modern manufacturing landscape, spanning an overwhelming range of processes and applications-- from small scale force-controlled grinding operations for orthopedic joints to large scale composite manufacturing of aircraft fuselages. Smart factories, seamlessly linked via industrial networks and sensing, have revolutionized mass production, allowing for intelligent, adaptive manufacturing processes across a broad spectrum of industries. Against this background, an emerging group of researchers, designers, and fabricators have begun to apply robotic technology in the pursuit of architecture, art, and design, implementing them in a range of processes and scales. Coupled with computational design tools the technology is no longer relegated to the repetitive production of the assembly line, and is instead being employed for the mass-customization of non-standard components. This radical shift in protocol has been enabled by the development of new design to production workflows and the recognition of robotic manipulators as "multi-functional" fabrication platforms, capable of being reconfigured to suit the specific needs of a process. The emerging discourse surrounding robotic fabrication seeks to question the existing norms of manufacturing and has far reaching implications for the future of how architects, artists, and designers engage with materialization processes. This book presents the proceedings of Rob|Arch2014, the second international conference on robotic fabrication in architecture, art, and design. It includes a Foreword by Sigrid Brell-Cokcan and Johannes Braumann, Association for Robots in Architecture. The work contained traverses a wide range of contemporary topics, from methodologies for incorporating dynamic material feedback into existing fabrication processes, to novel interfaces for robotic programming, to new processes for large-scale automated construction. The latent argument behind this research is that the term 'file-to-factory' must not be a reductive celebration of expediency but instead a perpetual challenge to increase the quality of feedback between design, matter, and making.

Official Gazette of the United States Patent and Trademark Office

Trademarks

Handbook on Differentiated Instruction for Middle & High Schools

Routledge This book has an abundance of time-saving, practical strategies for teachers in grades 6-12. A treasury of activities and resources, this book explains, demonstrates, and helps you select among a wide variety of differentiation processes, such as whole class differentiation, tiered lessons, learning centers, flexible grouping, literature circles, individualized instruction, independent study, and learning contracts.

Trust in Human-Robot Interaction

Academic Press Trust in Human-Robot Interaction addresses the gamut of factors that influence trust of robotic systems. The book presents the theory, fundamentals, techniques and diverse applications of the behavioral, cognitive and neural mechanisms of trust in human-robot interaction, covering topics like individual differences, transparency, communication, physical design, privacy and ethics. Presents a repository of the open questions and challenges in trust in HRI Includes contributions from many disciplines participating in HRI research, including psychology, neuroscience, sociology, engineering and computer science Examines human information processing as a foundation for understanding HRI Details the methods and techniques used to test and quantify trust in HRI

Robotic Welding, Intelligence and Automation

Springer Science & Business Media This research report brings together present trends in advanced welding robots, robotic welding, artificial intelligent and automatic welding. It includes important technical subjects on welding robots such as intelligent technologies and systems, and design and analysis. Modeling, identification and control of the welding process are presented, as well as knowledge-based systems for welding and tele-robotic welding. Other topics covered are sensing and data fusion, computer vision and virtual-reality applications of the welding process. An overview of intelligent and flexible manufacturing systems is given in addition to artificial intelligent technologies for industrial processes.

CIO

Grippers in Motion

The Fascination of Automated Handling Tasks

Springer Science & Business Media Grippers in Motion provides a comprehensive, practice-oriented guide to the fascinating details of automation processes involving gripping and manipulation. This intriguing and colorful book leads the reader from the history of automation and robotics to the fundamentals of the gripping process as well as the interaction of the gripping process with individual workpieces. Boundary conditions and initial situation of the gripping process are defined, and how subsequent motion follows gripping is shown. The implementation of these motion processes, from simple linear motions to the kinematics of multiple axes, is illustrated in a practical way. This practical introduction motivates students and even professionals to learn more about the world of robotic grippers. Grippers in Motion includes a spectrum of real-world applications demonstrating the possibilities and varieties of automation in practice.

Deep Learning for Robot Perception and Cognition

Academic Press Deep Learning for Robot Perception and Cognition introduces a broad range of topics and methods in deep learning for robot perception and cognition together with end-to-end methodologies. The book provides the conceptual and mathematical background needed for approaching a large number of robot perception and cognition tasks from an end-to-end learning point-of-view. The book is suitable for students, university and industry researchers and practitioners in Robotic Vision, Intelligent Control, Mechatronics, Deep Learning, Robotic Perception and Cognition tasks. Presents deep learning principles and methodologies Explains the principles of applying end-to-end learning in robotics applications Presents how to design and train deep learning models Shows how to apply deep learning in robot vision tasks such as object recognition, image classification, video analysis, and more Uses robotic simulation environments for training deep learning models Applies deep learning methods for different tasks ranging from planning and navigation to biosignal analysis

Robotics and Automation in Construction

BoD - Books on Demand This book addresses several issues related to the introduction of automaton and robotics in the construction industry in a collection of 23 chapters. The chapters are grouped in 3 main sections according to the theme or the type of technology they treat. Section I is dedicated to describe and analyse the main research challenges of Robotics and Automation in Construction (RAC). The second section consists of 12 chapters and is dedicated to the technologies and new developments employed to automate processes in the construction industry. Among these we have examples of ICT technologies used for purposes such as construction visualisation systems, added value management systems, construction materials and elements tracking using multiple IDs devices. This section also deals with Sensorial Systems and software used in the construction to improve the performances of machines such as cranes, and in improving Human-Machine Interfaces (MMI). Authors adopted Mixed and Augmented Reality in the MMI to ease the construction operations. Section III is dedicated to describe case studies of RAC and comprises 8 chapters. Among the eight chapters the section presents a robotic excavator and a semi-automated façade cleaning system. The section also presents work dedicated to enhancing the force of the workers in construction through the use of Robotic-powered exoskeletons and body joint-adapted assistive units, which allow the handling of greater loads.

Handbook of Manufacturing Engineering and Technology

Springer The Springer Reference Work Handbook of Manufacturing Engineering and Technology provides overviews and in-depth and authoritative analyses on the basic and cutting-edge manufacturing technologies and sciences across a broad spectrum of areas. These topics are commonly encountered in industries as well as in academia. Manufacturing engineering curricula across universities are now essential topics covered in major universities worldwide.

Cornucopiae, sive: Linguae Latinae commentarii

Business Week

Handey

A Robot Task Planner

Mit Press HANDEY is a task-level robot system that requires only a geometric description of a pick-and-place task rather than the specific robot motions necessary to carry out the task. The system-building process this book describes is an important step toward eliminating the current programming bottleneck that is keeping robots from fulfilling their scientific and economic potential. The HANDEY system, the state-of-the art technologies for developing it, and the problems encountered are clearly presented, aided by numerous marginal illustrations. The development of HANDEY is part of the authors' long-term goal of achieving systems that can manipulate a variety of objects in different environments using a wide class of robots. HANDEY has been tested on numerous pick-and-place tasks, including parts ranging from wooden cubes to electric motors; it can be used to generate commands for different types of industrial robots, can coordinate two arms working in the same workspace, and has been tested with a module that locates the position of a specific part in a jumble of other parts. The first three chapters introduce the HANDEY system and task-level robot programming systems in general, address the problem of planning pick-and-place tasks, review areas of geometric modeling and kinematics required for subsequent chapters, and introduce the concept of configuration space, which plays a prominent role in HANDEY. The next four chapters describe how HANDEY operates. Tomas Lozano-Perez, is a Professor in the Electrical Engineering and Computer Science Department and Associate Director of the Artificial Intelligence Laboratory at the Massachusetts Institute of Technology, where Joseph L. Jones and Patrick A. O'Donnell are Research Engineers. Emmanuel Mazer is Co-Director of the robotics group of Laboratoire d'Informatique Fondamentale et d'Intelligence in Grenoble, and a CNRS Research Fellow.

ABB

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Rob|Arch 2012

Robotic Fabrication in Architecture, Art and Design

Springer Science & Business Media This volume collects about 20 contributions on the topic of robotic construction methods. It is a proceedings volume of the robarch2012 symposium and workshop, which will take place in December 2012 in Vienna. Contributions will explore the current status quo in industry, science and practitioners. The symposium will be held as a biennial event. This book is to be the first of the series, comprising the current status of robotics in architecture, art and design.

CNC Programming using Fanuc Custom Macro B

McGraw Hill Professional Master CNC macro programming CNC Programming Using Fanuc Custom Macro B shows you how to implement powerful, advanced CNC macro programming techniques that result in unparalleled accuracy, flexible automation, and enhanced productivity. Step-by-step instructions begin with basic principles and gradually proceed in complexity. Specific descriptions and programming examples follow Fanuc's Custom Macro B language with reference to Fanuc Oi series controls. By the end of the book, you will be able to develop highly efficient programs that exploit the full potential of CNC machines. COVERAGE INCLUDES: Variables and expressions Types of variables--local, global, macro, and system variables Macro functions, including trigonometric, rounding, logical, and

conversion functions Branches and loops Subprograms Macro call Complex motion generation Parametric programming Custom canned cycles Probing Communication with external devices Programmable data entry

Robot Builder's Sourcebook

Over 2,500 Sources for Robot Parts

McGraw Hill Professional * A much-needed clearinghouse for information on amateur and educational robotics, containing over 2,500 listings of robot suppliers, including mail order and local area businesses * Contains resources for both common and hard-to-find parts and supplies * Features dozens of "sidebars" to clarify essential robotics technologies * Provides original articles on various robot-building topics

ROBOT 2017: Third Iberian Robotics Conference

Volume 2

Springer These volumes of "Advances in Intelligent Systems and Computing" highlight papers presented at the "Third Iberian Robotics Conference (ROBOT 2017)". Held from 22 to 24 November 2017 in Seville, Spain, the conference is a part of a series of conferences co-organized by SEIDROB (Spanish Society for Research and Development in Robotics) and SPR (Portuguese Society for Robotics). The conference is focused on Robotics scientific and technological activities in the Iberian Peninsula, although open to research and delegates from other countries. Thus, it has more than 500 authors from 21 countries. The volumes present scientific advances but also robotic industrial applications, looking to promote new collaborations between industry and academia.

Human Interface and the Management of Information. Visual Information and Knowledge Management

Thematic Area, HIMI 2019, Held as Part of the 21st HCI International Conference, HCII 2019, Orlando, FL, USA, July 26–31, 2019, Proceedings, Part I

Springer This two-volume set LNCS 11569 and 11570 constitutes the refereed proceedings of the Thematic Area on Human Interface and the Management of Information, HIMI 2019, held as part of HCI International 2019 in Orlando, FL, USA. HCII 2019 received a total of 5029 submissions, of which 1275 papers and 209 posters were accepted for publication after a careful reviewing process. The 91 papers presented in the two volumes were organized in topical sections named: Visual information; Data visualization and analytics; Information, cognition and learning; Information, empathy and persuasion; Knowledge management and sharing; Haptic and tactile interaction; Information in virtual and augmented reality; Machine learning and intelligent systems; Human motion and expression recognition and tracking; Medicine, healthcare and quality of life applications.

Software for Industrial Automation

United Nations Publications

CIO.

A resource for information executives, the online version of CIO offers executive programs, research centers, general discussion forums, online information technology links, and reports on information technology issues.

3D Game Engine Design

A Practical Approach to Real-Time Computer Graphics

CRC Press A major revision of the international bestseller on game programming! Graphics hardware has evolved enormously in the last decade. Hardware can now be directly controlled through techniques such as shader programming, which requires an entirely new thought process of a programmer. 3D Game Engine Design, Second Edition shows step-by-step how to make

CE Marking for EMC Directive

Amer Society of Mechanical All electric and electronic products designed and produced for export to the European Economic Area (EEA) must now conform to the new EMC Directive 89/336/EEC, which came into force in 1996. Under these regulations, all devices designated for free trade must satisfy certain minimum requirements regarding safety and electromagnetic compatibility. CE Marking for the EMC Directive is a pivotal guide to achieving certification. It examines the requirements imposed by the EMC Directive and the various routes, which must be taken to achieve full compliance. This comprehensive volume explains how companies can certify their own products, saving both time and money. It contains the complete text of the EMC Directive and answers frequently asked questions on the certification process. Practical examples and well-organized diagrams and drawings make this book invaluable to the electrical and electronic product designer or manufacturer.

Beschreibung des Oberamts Neuenbürg

BoD - Books on Demand Unveränderter Nachdruck der Originalausgabe von 1860.

Robot Vision

Springer Science & Business Media Over the past five years robot vision has emerged as a subject area with its own identity. A text based on the proceedings of the Symposium on Computer Vision and Sensor-based Robots held at the General Motors Research Laboratories, Warren, Michigan in 1978, was published by Plenum Press in 1979. This book, edited by George G. Dodd and Lothar Rosso!, probably represented the first identifiable book covering some aspects of robot vision. The subject of robot vision and sensory controls (RoViSeC) occupied an entire international conference held in the Hilton Hotel in Stratford, England in May 1981. This was followed by a second RoViSeC held in Stuttgart, Germany in November 1982. The large attendance at the Stratford conference and the obvious interest in the subject of robot vision at international robot meetings, provides the stimulus for this current collection of papers. Users and researchers entering the field of robot vision for the first time will encounter a bewildering array of publications on all aspects of computer vision of which robot vision forms a part. It is the grey area dividing the different aspects of computer vision which is not easy to identify. Even those involved in research sometimes find difficulty in separating the essential differences between vision for automated inspection and vision for robot applications. Both of these are to some extent applications of pattern recognition with the underlying philosophy of each defining the techniques used.

Intelligent Systems

Architecture, Design, and Control

Wiley-Interscience This comprehensive treatment of the field of intelligent systems is written by two of the foremost authorities in the field. The authors clearly examine the theoretical and practical aspects of these systems. The book focuses on the NIST-RCS (Real-time Control System) model that has been used recently in the Mars Rover.

Manufacturing Systems: Theory and Practice

Springer Science & Business Media Overviews manufacturing systems from the ground up, following the same concept as in the first edition. Delves into the fundamental building blocks of manufacturing systems: manufacturing processes and equipment. Discusses all topics from the viewpoint of four fundamental manufacturing attributes: cost, rate, flexibility and quality.

Shadow of the Xel'naga

Simon and Schuster Far in the future, 60,000 light-years from Earth, a loose confederacy of Terran exiles are locked in battle with the enigmatic Protoss and the ruthless Zerg Swarm. Each species struggles to ensure its own survival among the stars in a war that will herald the beginning of mankind's greatest chapter -- or foretell its violent, bloody end. Bhekar Ro: a bleak, backwater world on the fringe of the Terran Dominion, where every day is a struggle to survive for its handful of human colonists. It is a veritable wasteland -- one speck of dust among many in the vast, dark sea of space. But when the most violent storm in recent memory unearths an unfathomable alien artifact, Bhekar Ro becomes the greatest prize in the Terran Sector -- the Holy Grail of the Zerg, the Protoss, and Humanity alike -- as forces from the three great powers converge to claim the lost secrets of the most powerful species the universe has ever known. shadow of the xel'naga An original tale of space warfare novels set in the world of the bestselling computer game!

5th International Conference on Digital Enterprise Technology

Editions Publibook Digital Enterprise Technology (DET) is more than a concept. Companies are facing new challenges in a context where the references are mostly numerical. Nowadays, digital methods and tools are widely generalized. DET 2008 allowed excellent exchanges about "the collection of systems and methods for the digital modelling and analysis of the global product development and realisation process, in the context of lifecycle management". This book of proceedings gives a short vices of the keynotes and proposes the text of the papers that have been presented during DET 2008. This gives a clear view of the actual state of the art and of the industrial needs. This book of proceedings is organized with respect to the topics that were addressed during the conference.