Algorithmic Foundations Of Robotics Ix Selected Contributions Of The Ninth International Workshop On The Algorithmic Foundations Of Robotics Springer Tracts In Advanced Robotics

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Nature-Inspired Mobile Robotics Springer Science & Business Media
The International Symposium on Experimental Robotics (ISER) is a series of bi-annual meetings which are organized in a rotating fashion around North America, Europe and Asia/Oceania. The goal of ISER is to provide a forum for research in robotics that focuses on novelty of theoretical contributions validated by experimental results. The meetings are conceived to bring together, in a small group setting, researchers from around the world who are in the forefront of experimental robotics research. This unique reference presents the latest advances across the various fields of robotics, with ideas that are not only conceived conceptually but also verified experimentally. It collects contributions on the current developments and new directions in the field of experimental robotics, which are based on the papers presented at the Ninth ISER held in Singapore.
Advances in Mechanism and Machine Science MIT Press
Gathering presentations to the First International Conference on Cable-Driven Parallel Robots, this book covers classification and definition, kinematics, workspace analysis, cable modeling, hardware/prototype development, control and calibration and more.
Distributed Autonomous Robotic Systems Springer
This book gathers the outcomes of the thirteenth Workshop on the Algorithmic Foundations of Robotics (WAFR), the premier event for showcasing cutting-edge research on algorithmic robotics. The latest WAFR, held at Universidad Politécnica de Yucatán in Mérida, México on December 9–11, 2018, continued this tradition. This book contains fifty-four papers presented at WAFR, which highlight the latest research on fundamental algorithmic robotics (e.g., planning, learning, navigation, control, manipulation, optimality, completeness, and complexity) demonstrated through several applications involving multi-robot systems, perception, and contact manipulation. Addressing a diverse range of topics in papers prepared by expert contributors, the book reflects the state of the art and outlines future directions in the field of algorithmic robotics.
Algorithmic Foundations of Robotics VI Springer Nature
The monograph written by John Mullane, Ba-Ngu Vo, Martin Adams and Ba-Tuong Vo is devoted to the field of autonomous robot systems, which have been receiving a great deal of attention by the research community in the latest few years. The contents are focused on the problem of representing the environment and its uncertainty in terms of feature based maps. Random Finite Sets are adopted as the fundamental tool to represent a map, and a general framework is proposed for feature management, data association and state estimation. The approaches are tested in a number of experiments on both ground based and marine based facilities.
Selected Contributions of the Eighth International Workshop on the Algorithmic Foundations of

Robotics Springer
Robotics is at the cusp of dramatic transformation. Increasingly complex robots with unprecedented autonomy are finding new applications, from medical surgery, to construction, to home services. Against this background, the algorithmic foundations of robotics are becoming more crucial than ever, in order to build robots that are fast, safe, reliable, and adaptive. Algorithms enable robots to perceive, plan, control, and learn. The design and analysis of robot algorithms raise new fundamental questions that span computer science, electrical engineering, mechanical engineering, and mathematics. These algorithms are also finding applications beyond robotics, for example, in modeling molecular motion and creating digital characters for video games and architectural simulation. The Workshop on Algorithmic Foundations of Robotics (WAFR) is a highly selective meeting of leading researchers in the field of robot algorithms. Since its creation in 1994, it has published some of the field's most important and lasting contributions. This book contains the proceedings of the 9th WAFR, held on December 13-15, 2010 at the National University of Singapore. The 24 papers included in this book span a wide variety of topics from new theoretical insights to novel applications.
European Robotics Symposium 2006 Springer
Rough terrain robotics is a fast evolving field of research and a lot of effort is deployed towards enabling a greater level of autonomy for outdoor vehicles. This book demonstrates how the accuracy of 3D position tracking can be improved by considering rover locomotion in rough terrain as a holistic problem. Although the selection of appropriate sensors is crucial to accurately track the rover's position, it is not the only aspect to consider. Indeed, the use of an unadapted locomotion concept severely affects the signal to noise ratio of the sensors, which leads to poor motion estimates. In this work, a mechanical structure allowing smooth motion across obstacles with limited wheel slip is used. In particular, it enables the use of odometry and inertial sensors to improve the position estimation in rough terrain. A method for computing 3D motion increments based on the wheel encoders and chassis state sensors is developed. Because it accounts for the kinematics of the rover, this method provides better results than the standard approach. To further improve the accuracy of the position tracking and the rover's climbing performance, a controller minimizing wheel slip is developed. The algorithm runs online and can be adapted to any kind of passive wheeled rover. Finally, sensor fusion using 3D-Odometry, inertial sensors and visual motion estimation based on stereovision is presented. The experimental results demonstrate how each sensor contributes to increase the accuracy and robustness of the 3D position estimation.
Progress in Haptics Research Springer Science & Business Media
This book constitutes the refereed proceedings of the 14th Conference on Advances in Autonomous Robotics, TAROS 2013, held in Oxford, UK, in August 2013. The 36 revised full papers presented together with 25 extended abstracts were carefully reviewed and selected from 89 submissions. The papers cover various topics such as artificial intelligence, bio-inspired and aerial robotics, computer vision, control, humanoid and robotic arm, swarm robotics, verification and ethics.
Runtime Verification Springer Science & Business Media
Algorithms are a fundamental component of robotic systems: they control or reason about motion and perception in the physical world. They receive input from noisy sensors, consider geometric and physical constraints, and operate on the world through imprecise actuators. The design and analysis of robot algorithms therefore raises a unique combination of questions in control theory, computational and differential geometry, and computer science. This book contains the proceedings from the 2006 Workshop on the Algorithmic Foundations of Robotics. This biannual workshop is a highly selective meeting of leading researchers in the field of algorithmic issues related to robotics. The 32 papers in this book span a wide variety of topics: from fundamental motion planning algorithms to applications in medicine and biology, but they have in common a foundation in the algorithmic problems of robotic systems.
Field and Service Robotics Springer
This book constitutes the refereed proceedings of the 16th International Conference on Runtime Verification, RV 2016, held in Madrid, Spain, in September 2016. The 18 revised full papers presented together with 4 short papers, 3 tool papers, 2 tool demonstration papers, and 5 tutorials, were carefully reviewed and selected from 72 submissions. The RV conference is concerned with all aspects of monitoring and analysis of hardware, software and more general system executions. Runtime verification techniques are lightweight techniques to assess correctness, reliability, and robustness; these techniques are significantly more powerful and versatile than conventional testing, and more practical than exhaustive formal verification.
Proceedings of the Twelfth Workshop on the Algorithmic Foundations of Robotics Springer Science & Business Media
Musical robotics is a multi- and trans-disciplinary research area involving a wide range of different domains that contribute to its development, including: computer science, multimodal interfaces and processing, artificial intelligence, electronics, robotics, mechatronics and more. A musical robot requires many different complex systems to work together; integrating musical representation, techniques, expressions, detailed analysis and controls, for both playing and listening. The development of interactive multimodal systems provides advancements which enable enhanced human-machine interaction and novel possibilities for embodied robotic platforms. This volume is focused on this highly exciting interdisciplinary field. This book consists of 14 chapters highlighting different aspects of musical activities and interactions, discussing cutting edge research related to interactive multimodal systems and their integration with robots to further enhance musical understanding, interpretation, performance, education and enjoyment. It is dichotomized into two sections: Section I focuses on understanding elements of musical performance and expression while Section II concentrates on musical robots and automated instruments. Musical Robots and Interactive Multimodal Systems provides an introduction and foundation for researchers, students and practitioners to key achievements and current research trends on interactive multimodal systems and musical robotics.
Algorithmic Foundation of Robotics VII Springer
At the dawn of the new millennium, robotics is undergoing a major transformation in scope and dimension. From a largely dominant industrial focus, robotics is rapidly expanding into the challenges of unstructured environments. Interacting with, assi- ing, serving, and exploring with humans, the emerging robots will increasingly touch people and their lives. The goal of the Springer Tracts in Advanced Robotics (STAR) series is to bring, in a timely fashion, the latest advances and developments in robotics on the basis of their significance and quality. It is our hope that the wider dissemination of research - velopments will stimulate more exchanges and collaborations among the research community and contribute to further advancement of this rapidly growing field. The European Robotics Symposium (EUROS) was launched in 2006 as an inter- tional scientific single-track event promoted by EURON, the European Robotics Network linking most of the European research teams since its inception in 2000. Since then, EUROS has found its parental home under STAR, together with the other thematic symposia devoted to excellence in robotics research: FSR, ISER, ISRR, WAFR.
Algorithmic Foundations of Robotics X Algorithmic Foundations of Robotics IXSelected Contributions of the Ninth International Workshop on the Algorithmic Foundations of Robotics
This book gathers the proceedings of the 15th IFToMM World Congress, which was held in Krakow, Poland, from June 30 to July 4, 2019. Having been organized every four years since 1965, the Congress represents the world's largest scientific event on mechanism and machine science (MMS). The contributions cover an extremely diverse range of topics, including biomechanical engineering, computational kinematics, design methodologies, dynamics of machinery, multibody dynamics, gearing and transmissions, history of MMS, linkage and mechanical controls, robotics and mechatronics, micro-mechanisms, reliability of machines and mechanisms, rotor dynamics, standardization of terminology, sustainable energy systems, transportation machinery, tribology and vibration. Selected by means of a rigorous international peer-review process, they highlight numerous exciting advances and ideas that will spur novel research directions and foster new multidisciplinary collaborations.
Robotics Springer
The atomic force microscope (AFM) has been successfully used to perform nanorobotic manipulation operations on nanoscale entities such as particles, nanotubes, nanowires, nanocrystals, and DNA since 1990s. There have been many progress on modeling, imaging, teleoperated or automated control, human-machine interfacing, instrumentation, and applications of AFM based nanorobotic manipulation systems in literature. This book aims to include all of such state-of-the-art progress in an organized, structured, and detailed manner as a reference book and also potentially a textbook in nanorobotics and any other nanoscale dynamics, systems and controls related research and education. Clearly written and well-organized, this text introduces designs and prototypes of the nanorobotic systems in detail with innovative principles of three-dimensional manipulation force microscopy and parallel imaging/manipulation force microscopy.
Visual Perception and Robotic Manipulation Springer
Algorithmic Foundations of Robotics IXSelected Contributions of the Ninth International Workshop on the Algorithmic Foundations of RoboticsSpringer
Proceedings of the 15th IFToMM World Congress on Mechanism and Machine Science Springer
This book contains selected contributions to WAFR, the highly-competitive meeting on the algorithmic foundations of robotics. They address the unique combination of questions that the design and analysis of robot algorithms inspires.
Algorithmic Foundations of Robotics IX Springer
This book is a printed edition of the Special Issue "UAV Sensors for Environmental Monitoring" that was published in Sensors
Results of the 5th International Conference Springer Science & Business Media
The 5th International Conference on Field and Service Robotics (FSR05) was held in Port Douglas, Australia, on 29th - 31st July 2005, and brought together the worlds' leading experts in field and service automation. The goal of the conference was to report and encourage the latest research and practical results towards the use of field and service robotics in the community with particular focus on proven technology. The conference provided a forum for researchers, professionals and robot manufacturers to exchange up-to-date technical knowledge and experience. Field robots are robots which operate in outdoor, complex, and dynamic environments. Service robots are those that work closely with humans, with particular applications involving indoor and structured environments. There are a wide range of topics presented in this issue on field and service robots including: Agricultural and Forestry Robotics, Mining and Exploration Robots, Robots for Construction, Security & Defence Robots, Cleaning Robots, Autonomous Underwater Vehicles and Autonomous Flying Robots. This meeting was the fifth in the series and brings FSR back to Australia where it was first held. FSR has been held every 2 years, starting with Canberra 1997, followed by Pittsburgh 1999, Helsinki 2001 and Lake Yamanaka 2003.
Robotics Research Springer Science & Business Media
This work presents a new concept of a Collaborative Assistance Vehicle with high interaction capabilities for collaboration with external users outside the vehicle. This work proposes a functional architecture for level 4 automated driving that focuses on an interaction framework, along with algorithmic solutions for implementing core function modules. Perception, command extraction, and behavior planning are part of the core function modules. All of these modules will be implemented and evaluated.
Selected Contributions of the Eleventh International Workshop on the Algorithmic Foundations of Robotics Springer Science & Business Media
This volume of proceedings includes 32 original contributions presented at the 12th International Symposium on Distributed Autonomous Robotic Systems (DARS 2014), held in November 2014. The selected papers in this volume are authored by leading researchers from Asia, Australia, Europe, and the Americas, thereby providing a broad coverage and perspective of the state-of-the-art technologies, algorithms, system architectures, and applications in distributed robotic systems.
Special Issue on the Eighth International Workshop on the Algorithmic Foundations of Robotics, [... Held 7 - 9 December 2008 at ... Guanajuato, Mexico] Springer
The five-volume set LNCS 10111-10115 constitutes the thoroughly refereed post-conference proceedings of the 13th Asian Conference on Computer Vision, ACCV 2016, held in Taipei, Taiwan, in November 2016. The total of 143 contributions presented in these volumes was carefully reviewed and selected from 479 submissions. The papers are organized in topical sections on Segmentation and Classification; Segmentation and Semantic Segmentation; Dictionary Learning, Retrieval, and Clustering; Deep Learning; People Tracking and Action Recognition; People and Actions; Faces; Computational Photography; Face and Gestures; Image Alignment; Computational Photography and Image Processing; Language and Video; 3D Computer Vision; Image Attributes, Language, and Recognition; Video Understanding; and 3D Vision.