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Advanced Tactile Sensing for Robotics - Howard R Nicholls - 1992-12-10

Robot Sensors - Alan Pugh - 1986-01-01
V.1 Vision.--v.2. Tactile and non-vision.

Robot Sensors - Alan Pugh - 1986-01-01
V.1 Vision.--v.2. Tactile and non-vision.

Computer Vision and Sensor-Based Robots - C.H. Dodd - 2012-12-06

The goal of the symposium, "Computer Vision and Sensor-Based Robots," held at the General Motors Research Laboratories on September 25 and 26, 1978, was to stimulate a closer interaction between people working in diverse areas and to discuss fundamental issues related to vision and robotics. This book contains the papers and general discussions of that symposium, the 22nd in an annual series covering different technical disciplines that are timely and of interest to General Motors as well as the technical community at large. The subject of this symposium remains timely because the cost of computer vision hardware continues to drop and there is increasing use of robots in manufacturing applications. Current industrial applications of computer vision range from simple systems that measure or compare to sophisticated systems for part location determination and inspection. Almost all industrial robots today work with known parts in known positions, and we are just now beginning to see the emergence of programmable automata in which the robot can react to its environment when stimulated by visual and force-touch sensor inputs. As discussed in the symposium, future advances will depend largely on research now underway in several key areas. Development of vision systems that can meet industrial speed and resolution requirements with a sense of depth and color is a necessary step.

Robot Sensors - Alan Pugh - 1986
V.1 Vision.--v.2. Tactile and non-vision.

Advanced Tactile Sensing for Robotics - Howard R Nicholls - 1992-12-10

Advanced robot systems require sensory information to enable them to make decisions and to carry out actions in a versatile, autonomous way. Humans make considerable use of information derived through touch, and an emerging domain of robot sensing is tactile sensing. This book considers various aspects of tactile sensing, from hardware design through to the use of tactile data in exploratory situations using a multi-fingered robot hand. In the first part of the book, the current state of progress of tactile sensing is surveyed, and it is found that the field is still in an early stage of development. Next, some fundamental issues in planar elasticity, concerning the interaction between tactile sensors and the environment, are presented. Having established how the basic data can be derived from the sensors, the issues of what form tactile sensors should take, and how they should be used, are considered. This is particularly important given the infancy of this field. The human tactile system is examined, and then biological touch and its implications for robotics is looked at. Some experiments in dextrous manipulation using a robot hand are described, which apply some of these results. The integration of tactile sensors into a complete system is also considered, and another, novel, approach for using touch sensing in a flexible assembly machine is described. Both basic material and new research results are provided in this book, thus catering to different levels of readers. The chapters by world experts in different aspects of the field are integrated well into one volume. The editor and authors have produced a thorough and in-depth survey of all work in robot tactile sensing, making the book essential reading for all researchers in this emergent field.

Contents: Introduction to Tactile Sensing; Tactile Sensor Designs; Processing and Using Tactile Sensor Data (H R Nicholls); Planar Elasticity for Tactile Sensing (R S Fearing); Integrate Tactile Sensors — ESPIRIT 270 (Z G Ryczynski); Distributed Touch Sensing (H R Nicholls & N W Hardy); The Human Tactile System (L Moss-Salentijn); Lessons from the Study of Biological Touch for Robotic Tactile Sensing (S J Lederman & D T Pawluck); Lessons from the Study of Biological Touch for Robotic Haptic Sensing (S J Lederman et al.); Object Recognition Using Tactile Sensing (P K Allen); Experiments in Active Haptic Perception with the Utah-MIT Dexterous Hand (P K Allen et al.); Future Trends in Tactile Sensing (H R Nicholls); Appendix — Basic Linear Elasticity (R S Fearing); Readship: Computer scientists and engineers. Keywords: Tactile Sensing, Tactile Sensor, Force Sensing, Force Sensor, Image Processing, Intelligent Robotics, Haptics, Robot Gripper, Robot Grasping, Touch Sensing, Touch Sensor. "The book is well presented, with copious references to the literature, and will certainly be accepted as a standard work of reference in this area."

Robotica

Advanced Tactile Sensing for Robotics - Howard R Nicholls - 1992-12-10

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Robotics engineering has progressed from an infant industry in 1961 to one including over 500 robot and allied firms around the world in 1989. During this growth period, many robotics books have been published, some of which have served as industry standards. Until recently, the design of robotics systems has been primarily the responsibility of the mechanical engineer, and their application in factories has been the responsibility of the manufacturing engineer. Few robotics books address the many systems issues facing electronics engineers or computer programmers. The mid-1980s witnessed a major change in the robotics field. The development of advanced sensor systems (particularly vision), improvements in the intelligence area, and the desire to integrate groups of robots working together in local work cells or in factory-wide systems have greatly increased the participation of electronics engineers and computer programmers. Further, as robots gain mobility, they are being used in completely new areas, such as construction, firefighting, and underwater exploration, and the need for robotics books that address the many systems issues facing electronics engineers or computer programmers. The need for robotics books that address the many systems issues facing electronics engineers or computer programmers. The need for robotics books that address the many systems issues facing electronics engineers or computer programmers. The need for robotics books that address the many systems issues facing electronics engineers or computer programmers. The need for robotics books that address the many systems issues facing electronics engineers or computer programmers. The need for robotics books that address the many systems issues facing electronics engineers or computer programmers.
modern sensors technology, presents a selection of cutting-edge applications. Written by experts in their area of
The World Yearbook of Robotics Research and Development - Shobuk Shetty - 2013-04-17
How quickly the technological 'flavour of the month' changes. At the beginning of the 1980's many saw 'robotics' as
being something of a panacea for those problems in the manufacturing industries which had been exacerbated by
the world recession. Those working at the time in the field of robotics stressed that robots themselves were
only part of the solution. Yet in many quarters the 'hype' for the new technology apparently knew few bounds,
resulting, inexorably, in many industries painfully discovering for themselves a new realism, closely followed by
disillusionment. In its wider sense the term 'robotics' covers an extremely broad spec trum of technologies
ranging from extremely flexible, highly sensory and integrated systems capable of handling a very diverse product
range, through to comparatively inflexible, high volume systems which can merely handle slightly different
variations of the same basic product. As a result of the one 'buzzword' referring to such a variety of actual system
types, the disillusionment which started to become apparent during the early 1980's acted as something of a
double edged sword. A given company might consider a particular robotics-based technological solution to its
production problems, find that it was unsuitable, and so renounce all robotics approaches as inappropriate.
Yet just because one position on that spectrum of technological solutions was unsuitable for the company should not
have led them to assume that there was no other robotics solution that was appropriate.

Integration of Lasers and Fiber Optics Into Robotic Systems - Janusz A. Marszałek - 1994
A broad variety of techniques described in this book, as applied to a number of tasks in robotics, provide the
reader with a feel for the potential of lasers and fiber optics in this area of increasing relevance. The many
decorations and systems that are included here are of interest to the nonspecialist as well as to the
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Mechatronics - David Allan Bradley - 2018-04-27
Mechatronics: Electronics in Products and Processes identifies the concepts which underpin the mechatronic
approach to engineering design and brings together its principle components - sensors and transducers,
embedded microprocessors, actuators and drives - to explore their interrelationships. The text focuses primarily
on hardware elements and the impact of system architecture. Modern technology is set in an historical
background and each chapter comes with learning objectives and chapter outlines. The book includes numerous
case studies illustrating the concepts applied in such areas as automatic cameras, aerospace parts manufacturing,
fly-by-wire systems, and boat autopilot.

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fly-by-wire systems, and boat autopilot.

Sensors - Yueh-Min Ray Huang - 2008-07-24
Sensors are the most important component in any system and engineers in any field need to understand the
fundamentals of how these components work, how to select them properly and how to integrate them into an
overall system. This book has outlined the fundamentals, analytical concepts, modelling and design issues,
technical details and practical applications of different types of sensors, electromagnetic, capacitive, ultrasonic,
vision, Terahertz, displacement, fibre-optic and so on. The book addresses the identification, modeling, selection,
operation and integration of a wide variety of sensors, demonstrates the concepts of different sensors technology
through simulation, design and real implementations, discusses the design and fabrication of high performance
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modern sensors technology, presents a selection of cutting-edge applications. Written by experts in their area of
research, this book will be useful reference book for engineers and scientist especially the post-graduate students
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Introduction to the Mechanics of Space Robots - Giancarlo Genta - 2011-10-27
Based on lecture notes on a space robotics course, this book offers a pedagogical introduction to the mechanics
of space robots. After presenting an overview of the environments and conditions space robots have to work in, the
author discusses a variety of manipulatory devices robots may use to perform their tasks. This is followed by a
discussion of robot mobility in these environments and the various technical approaches. The last two chapters
are dedicated to actuators, sensors and power systems used in space robots. This book fills a gap in the space
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Sensors for Industrial Inspection - C. Loughlin - 2012-12-06
Numerous areas of expertise are often required for the inspection of an individual product, with many different
sensors being used within a single inspection machine. For this reason it is necessary for the production engineer
to have at least a working knowledge of all the different technologies that may be employed. This book covers the
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Flexible Automation and Intelligent Manufacturing 1997 - Mohammad Munir Ahmad - 1997
Flexible Automation and Intelligent Manufacturing 1997 - Mohammad Munir Ahmad - 1997
UAV-Based Remote Sensing Volume 1 - Felipe Gonzalez Toro - 2018-04-27

Most industrial robots today have little or no sensory capability. Feedback is limited to information about joint processing, and parallel algorithms and architectures for robotic computations.


This monograph introduces novel methods for the control and navigation of mobile robots using multiple-1-d view models obtained from omni-directional cameras. This approach overcomes field-of-view and robustness limitations, simultaneously enhancing accuracy and simplifying application on real platforms. The authors also address coordinated motion tasks for multiple robots, exploring different system architectures, particularly the use of multiple aerial cameras in driving robot formations on the ground. Again, this has benefits of simplicity, scalability and flexibility. Coverage includes details of: a method for visual robot homing based on a memory of omni-directional images; a novel vision-based pose stabilization methodology for non-holonomic ground robots based on sinusoidal-varying control inputs; an algorithm to recover a generic motion between two 1-d views and which does not require a third view; a novel multi-robot setup where multiple camera-carrying unmanned aerial vehicles are used to observe and control a formation of ground mobile robots; and three coordinate-free methods for decentralized mobile robot formation stabilization. The performance of the different methods is evaluated both in simulation and experimentally with real robotic platforms and vision sensors. Control of Multiple Robots Using Vision Sensors will serve both academic researchers studying visual control of single and multiple robots and robotics engineers seeking to design control systems based on visual sensors.

Sensor-Based Robots: Algorithms and Architectures - C.S. George Lee - 2012-12-06

Most industrial robots today have little or no sensory capability. Feedback is limited to information about joint positions, combined with a few interlock and timing signals. These robots can function only in an environment where the objects to be manipulated are precisely located in the proper position for the robot to grasp (i.e., in a structured environment). For many present industrial applications, this level of performance has been adequate. With the increasing demand for high performance sensor-based robot manipulators in assembly tasks, meeting this demand and challenge can only be achieved through the consideration of: 1) efficient acquisition and processing of internal/external sensory information, 2) utilization and integration of sensory information from various sensors (tactile, force, and vision) to acquire knowledge in a changing environment, 3) exploitation of inherent robotic parallel algorithms and efficient VLSI architectures for robotic computations, and finally 4) system integration into a working and functioning robotic system. This is the intent of the Workshop on Sensor-Based Robots: Algorithms and Architectures - to study the fundamental research issues and problems associated with sensor-based robot manipulators and to propose approaches and solutions from various viewpoints in improving present day robot manipulator tasks in the areas of sensor fusion and integration, sensory information processing, and parallel algorithms and architectures for robotic computations.


Written from an engineering perspective, this book incorporates a thorough theoretical introduction to the underlying disciplines via its treatment of a generic machine vision system model. Dedicated chapters introduce image acquisition techniques matched to constrained environments, image processing, segmentation, feature extraction, pattern classification (including neural approaches) and interpreting two-dimensional views of the three-dimensional world. It is richly illustrated with case studies of image processing in a wide range of application domains.

People of Today 2017 - Lucy Hume - 2017-10-05

Established in 1962, People of Today annually recognises over 20,000 individuals who are positively influencing Britain and inspiring others through their achievements and leadership. Entry is by invitation only. The objective criteria for inclusion and removal are strictly maintained, ensuring it is the only publication of its type whose membership accurately reflects people of influence today. Expert nomination panels guarantee People of Today is uniquely current and trusted and encompasses over 40 sectors, from academia, law and business to charity, sport and the arts. Established in 1962, People of Today annually recognises over 20,000 individuals who are positively influencing Britain and inspiring others through their achievements and leadership. Entry is by invitation only. The objective criteria for inclusion and removal are strictly maintained, ensuring it is the only publication of its type whose membership accurately reflects people of influence today. Expert nomination panels guarantee People of Today is uniquely current and trusted and encompasses over 40 sectors, from academia, law and business to charity, sport and the arts.

Robot Vision - Berthold Horn - 1986

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Robot Vision - A. Pugh - 2013-06-29

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 Rossel, 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 applications. Both of these are to some extent applications of pattern recognition with the underlying philosophy of each defining the techniques used.

Robotics is a highly interdisciplinary research topic, that requires integration of methods for mechanics, control engineering, signal processing, planning, gra-ics, human-computer interaction, real-time systems, applied mathematics, and software engineering to enable construction of fully operational systems. The diversity of topics needed to design, implement, and deploy such systems implies that it is almost impossible for individual teams to provide the needed critical mass for such endeavors. To facilitate interaction and progress on sensor-based intelligent robotics inter-disciplinary workshops are necessary through which -depthdiscussioncanbeexchangedforcrossdisseminationbetween?erentdisciplines. The Dagstuhl foundation has organized a number of workshops on Mod- ing and Integration of Sensor Based Intelligent Robot Systems. The Dagstuhl seminars take place over a full week in a beautiful setting in the Saarland in Germany. The setting provides an ideal environment for in-depth presentations and rich interaction between the participants. This volume contains papers presented during the fourth workshop held -tober 15-20, 2000. All papers were submitted by workshop attendees, and were reviewed by at least one reviewer. We wish to thank all of the reviewers for their invaluable help in making this a high-quality selection of papers. We gratefully acknowledge the support of the Schloss Dagstuhl Foundation and the sta? at Springer-Verlag. Without their support the production of this volume would not have been possible.

Robot Vision - A. Pugh - 2013-06-29

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Optics, Illumination, and Image Sensing for Machine Vision - - 1986

Optics, Illumination, and Image Sensing for Machine Vision - - 1986

UAV-Based Remote Sensing Volume 2 - Felipe Gonzalez Toro - 2018-04-27

This book is a printed edition of the Special Issue "UAV-Based Remote Sensing" that was published in Sensors

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The Human Hand as an Inspiration for Robot Hand Development - Ravi Balasubramanian - 2014-01-03

“The Human Hand as an Inspiration for Robot Hand Development” presents an edited collection of authoritative contributions in the area of robot hands. The results described in the volume are expected to lead to more robust, dependable, and inexpensive distributed systems such as those endowed with complex and advanced sensing, actuation, computation, and communication capabilities. The twenty-four chapters discuss the field of robotic grasping and manipulation viewed in light of the human hand’s capabilities and push the state-of-the-art in robot hand design and control. Topics discussed include human hand biomechanics, neural control, sensory feedback and perception, and robotic grasp and manipulation. This book will be useful for researchers from diverse areas such as robotics, biomechanics, neuroscience, and anthropologists.

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The Management of Productivity and Technology in Manufacturing - Paul R. Kleindorfer - 2013-11-11
This volume is concerned with the nature of new manufacturing technologies, such as CAD/CAM and robotics, as well as appropriate methodologies for evaluating whether such technologies are financially and organizationally viable in particular contexts. The chapters included here were commissioned as papers for presen tation at The Wharton Conference on Productivity, Technology, and Organizational Innovation, which took place in Philadelphia on December 8 and 9 of 1983. The conference was sponsored by The University of Pennsylvania's Center for the Study of Organizational Innovation. There has been a surge of interest in the area of manufacturing over the past ten years as managers have come to realize that the operations function is critical to remaining competitive. New status has been given to factory and operations managers. New programs revitalizing manufacturing and distribution have been introduced in organizations. Corporate strategy is now explicitly considering operations and manufacturing functions. And the curricula of leading business schools are reflecting the rapidly advancing research on technology management and manufacturing operations. In spite of these important signs of progress, we are clearly just at the beginning of understanding the issues involved here. The present volume provides a state-of-the-art review of the realities of technology management and manufacturing strategy. As described in the Editor's Introduction, we address four topics: The Nature of New Manufacturing Technology, Innovation and Manufacturing Strategy, Productivity Management, and Technology Management and Organiz ation. These issues are clearly very important themes for U.S.

Advanced Robotics & Intelligent Machines - Institution of Electrical Engineers - 1996
Advanced robotics' describes the use of sensor-based robotic devices which exploit powerful computers to achieve the high levels of functionality that begin to mimic intelligent human behaviour. The object of this book is to summarise developments in the base technologies, survey recent applications and highlight new advanced concepts which wi ll influence future progress. I. Technologies (Recent developments in advanced robotics and intelligent systems; Machine intelligence - architectures, controllers and applications; Advanced control systems for robotic arms; Intelligent gripping systems; Force feedback control in robots applied to de commisioning; Telepresence control of robots; Sensing and sensor management for planning); II Applications (Robotics in the nuclear industry; Robots in surgery; Intelligent autonomous systems for cars; Walking machine technology; Handling of flexible materials in automation; Robotics in food manufacturing; Robotic milking; Error-free semiconductor wafer handling); III Advanced concepts and processes (The concept of intelligence society and its utilisation; Minirobots and microrobotics; Characteristics of robot behavior; A behaviour synthesis architecture for co-operating mobile robots; Co-operative behaviour in multiple manipulators; Neural networks in automation procedures; Parallel processing, neural networks and genetic algorithms for real-time robot control); Index.

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**Sensor Fusion** - Society of Photo-optical Instrumentation Engineers - 1989

**Robot Manipulators** - Etienne Dombre - 2013-03-01

This book presents the most recent research results on modeling and control of robot manipulators. Chapter 1 gives unified tools to derive direct and inverse geometric, kinematic and dynamic models of serial robots and addresses the issue of identification of the geometric and dynamic parameters of these models. Chapter 2 describes the different architectures of the different robots and the methods used to obtain direct and inverse geometric, kinematic and dynamic models, paying special attention to singularity analysis. Chapter 3 introduces global and local tools for the determination of the geometric and dynamic models. Chapter 4 presents an original optimization technique for point-to-point trajectory generation in robotic dynamics. Chapter 5 presents standard control techniques in the joint space and task space for free motion (PID, computed torque, adaptive dynamic control and variable structure control) and constrained motion (compliant force-position control). In Chapter 6, the concept of vision-based control is developed and Chapter 7 is devoted to the issue of control with flexible links. Efficient recursive Newton-Euler algorithms for both inverse and direct models are presented, as well as control methods concerning position setting and vibration damping.

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This edited and reviewed volume consists of papers that were originally presented at a workshop in the Scientific Center at Schloss Dagstuhl, Germany. It gives an overview of the field and presents the latest developments in the areas of modeling and planning for sensor-based robots. The particular topics addressed include active vision, sensor fusion, environment modeling, motion planning, robot navigation, distributed control architectures, reactive behavior, and others.

**Intelligent Autonomous Systems 12** - Sukhan Lee - 2012-10-18

Intelligent autonomous systems are emerging as a key enabler for the creation of a new paradigm of services to humankind, as seen by the recent advancement of autonomous cars licensed for driving in our streets, of unmanned aerial and underwater vehicles carrying out hazardous tasks on-site, and of space robots engaged in scientific as well as operational missions, to list only a few. This book aims at serving the researchers and practitioners in related fields with a timely dissemination of the recent progress on intelligent autonomous systems, based on a collection of papers presented at the 12th International Conference on Intelligent Autonomous Systems, held in Jeju, Korea, June 26-29, 2012. With the theme of “Intelligence and Autonomy for the Service to Humankind, the conference has covered such diverse areas as autonomous ground, aerial, and underwater vehicles, intelligent transportation systems, personal/domestic service robots, professional service robots for surgery/ rehabilitation, rescue/security and space applications, and intelligent autonomous systems for manufacturing and healthcare. This volume includes contributions devoted to Service Robotics and Human-Robot Interaction and Autonomous Multi-Agent Systems and Life Engineering.

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**Robotics Research** - Georges Giralt - 2012-12-06

This publication covers all the topics which are relevant to Advanced Robotics today, ranging from Systems Design to Reasoning and Planning. It is based on the Seventh International Symposium on Robotics Research held in Germany on October, 21 - 24th, 1995. The papers were written by specialists in the field from the United States, Europe, Japan, Australia and Canada. The editors, who also chaired this symposium, present the latest research results as well as new approaches to long-standing problems. Robotics Research is a contribution to the emerging concepts, methods and tools that shape Robotics. The papers range from pure research reports to application-oriented studies. The topics covered include: manipulation, control, virtual reality, motion planning, 3D vision and industrial systems' issues.

**Robotics Research** - Georges Giralt - 2012-12-06

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**Transactions on Intelligent Welding Manufacturing** - Shanben Chen - 2020-01-11
The primary aim of this volume is to provide researchers and engineers from both academic and industry with up-to-date coverage of new results in the field of robotic welding, intelligent systems and automation. The book is mainly based on papers selected from the 2019 International Workshop on Intelligentized Welding Manufacturing (IWIWM'2019) in USA. The articles show that the intelligentized welding manufacturing (IWM) is becoming an inevitable trend with the intelligentized robotic welding as the key technology. The volume is divided into four logical parts: Intelligent Techniques for Robotic Welding, Sensing of Arc Welding Processing, Modeling and Intelligent Control of Welding Processing, as well as Intelligent Control and its Applications in Engineering.

**Traditional and Non-Traditional Robotic Sensors** - Thomas C. Henderson - 2012-12-06
This book contains the written record of the NATO Advanced Research Workshop on Traditional and Non-Traditional Robotic Sensors held in the Hotel Villa del Mare, Maratea, Italy, August 28 - September 1, 1989. This workshop was organized under the auspices of the NATO Special Program on Sensory Systems for Robotic Control. Professor Frans Groen from the University of Amsterdam and Dr. Gert Hirzinger from the German Aerospace Research Establishment (DLR) served as members of the organizing committee for this workshop. Research in the area of robotic sensors is necessary in order to support a wide range of applications, including: industrial automation, space robotics, image analysis, microelectronics, and intelligent sensors. This workshop focused on the role of traditional and non-traditional sensors in robotics. In particular, the following three topics were explored: - Sensor development and technology, - Multisensor integration techniques, - Application area requirements which motivate sensor development directions. This workshop brought together experts from NATO countries to discuss recent developments in these three areas. Many new directions (or new directions on old problems) were proposed. Existing sensors should be pushed into new application domains such as medical robotics and space robotics.

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