

# Springer Tracts in Advanced Robotics

## Volume 5

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Editors: Bruno Siciliano · Oussama Khatib · Frans Groen

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Bruno Siciliano · Paolo Dario (Eds.)

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# Experimental Robotics VIII

With 455 Figures



Springer

**Professor Bruno Siciliano**, Dipartimento di Informatica e Sistemistica, Università degli Studi di Napoli Federico II, Via Claudio 21, 80125 Napoli, Italy, email: [siciliano@unina.it](mailto:siciliano@unina.it)

**Professor Oussama Khatib**, Robotics Laboratory, Department of Computer Science, Stanford University, Stanford, CA 94305-9010, USA, email: [khatib@cs.stanford.edu](mailto:khatib@cs.stanford.edu)

**Professor Frans Groen**, Department of Computer Science, Universiteit van Amsterdam, Kruislaan 403, 1098 SJ Amsterdam, The Netherlands, email: [groen@science.uva.nl](mailto:groen@science.uva.nl)

STAR (Springer Tracts in Advanced Robotics) has been promoted under the auspices of EURON (European Robotics Research Network)

## Editors

Prof. Bruno Siciliano

Dipartimento di Ingegneria dell'Informazione e Ingegneria Elettrica

Università degli Studi di Salerno

Via Ponte Don Melillo

84084 Fisciano (SA), Italy

[bsiciliano@unisa.it](mailto:bsiciliano@unisa.it)

Prof. Paolo Dario

Scuola Superiore di Studi Universitari e di Perfezionamento Sant'Anna

Piazza Martiri della Libertà 33

56127 Pisa, Italy

[dario@mail-arts.sssup.it](mailto:dario@mail-arts.sssup.it)

ISSN 1610-7438

ISBN 3-540-00305-3 Springer-Verlag Berlin Heidelberg New York

Cataloging-in-Publication Data applied for

Bibliographic information published by Die Deutsche Bibliothek

Die Deutsche Bibliothek lists this publication in the Deutsche Nationalbibliografie; detailed bibliographic data is available in the Internet at <http://dnb.ddb.de>.

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Springer-Verlag Berlin Heidelberg New York

a member of BertelsmannSpringer Science + Business Media GmbH

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Printed in Germany

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Typesetting: Digital data supplied by author. Data-conversion by PTP-Berlin e.k., Stefan Sossna

Cover-Design: design & production GmbH, Heidelberg

Printed on acid-free paper 62/3020 Rw - 5 4 3 2 1 0

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# Foreword

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, assisting, serving, and exploring with humans, the emerging robots will increasingly touch people and their lives.

The goal of the new series of *Springer Tracts in Advanced Robotics (STAR)* 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 developments will stimulate more exchanges and collaborations among the research community and contribute to further advancement of this rapidly growing field.

Since its inception some fourteen years ago, ISER, the *International Symposium on Experimental Robotics* was published in the Springer Lecture Notes in Control and Information Sciences (LNCIS). With the launching of STAR, a more suitable home is found for this and other thematic symposia devoted to excellence in robotics research.

The Eighth edition of *Experimental Robotics* edited by Bruno Siciliano and Paolo Dario offers in its fifteen-chapter volume a collection of a broad range of topics in robotics. The contents of these contributions represent a cross-section of the current state of robotics research from one particular aspect: experimental work, and how it reflects on the theoretical basis of subsequent developments. Experimental validation of algorithms, design concepts, or techniques is the common thread running through this large collection of widely diverse contributions.

From its charming venue to its excellent program, ISER culminates with this unique reference on the current developments and new directions in the field of experimental robotics — a tribute to the commitment and dedication of its hosts!

California, USA  
November 2002

*Oussama Khatib*  
*STAR Editor*

# Preface

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. Previous venues were Montréal (Canada), Toulouse (France), Kyoto (Japan), Stanford (USA), Barcelona (Spain), Sydney (Australia), Honolulu (USA). The goal of these symposia is to provide a forum for research in robotics that focuses on theories and principles that are validated by experiments. 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.

The post-symposium Experimental Robotics proceedings have traditionally been published by Springer-Verlag. In addition to the proceedings, these symposia have produced compilation of video segments illustrating the reported research, which are available as video proceedings.

The *Eight International Symposium on Experimental Robotics (ISER'02)* was held in the charming sea village of Sant'Angelo on the island of Ischia in the gulf of Naples, Italy on 8–11 July 2002. The symposium was chaired by Bruno Siciliano and Paolo Dario.

The meeting consisted of three keynote talks, a forum with open discussion, and fifty-eight contributed presentations in a single track. Each paper was refereed by at least two members of the Steering Committee. This was composed of the following individuals:

Oussama Khatib	Stanford University, USA (Chair)
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Alex Zelinsky	Australian National University, Australia

Topics reported in the fifteen chapters of this volume include humanoids and human-centered robotics, path planning and localization, visual servoing, multiple robots, identification and control, design, medical robotics, flying robots, manipulation and haptics, walking machines, field robotics. Several research projects presented at ISER '02 are clearly breakthroughs in the field and will likely have a big impact in the future. Noticeably, for the first time in the history of the ISER volumes, this edition is introduced by the paper contributions of the three symposium keynote speakers: Steve Jacobsen (Sarcos Research Corporation and University of Utah, USA), Gerd Hirzinger (DLR, Germany), and Shigeo Hirose (Tokyo Institute of Technology, Japan).

We are very grateful to University of Cassino and University of Salerno for their generous financial support to ISER '02. We would like to thank the 216 contributors as well as the 101 participants, who made our meeting truly exciting and inspiring. We warmly acknowledge the hard work done by the Organizing Committee: Stefano Chiaverini (Università di Cassino) for the scientific secretariat including the review process management, Luigi Villani (Università di Napoli Federico II) for all the publication aspects including the collection of contributions in final form turning into this volume, Fabrizio Caccavale (Università della Basilicata) for the symposium registration with the valuable support of Chiara Stefanetti (Centro Volta Como), Francesco Basile (Università di Salerno) and Rosario Marino (Università di Napoli Federico II) for the local arrangements. A final note of mention is for Tom Ditzinger, our Springer Engineering Editor, for his great enthusiasm in the project.

Italy  
November 2002

*Bruno Siciliano*  
*Paolo Dario*



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