

Lecture Notes in Control and Information Sciences

250

Editor: M. Thoma

Springer

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Peter Corke and James Trevelyan (Eds)

Experimental Robotics VI

With 358 Figures



Springer

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ISBN 1-85233-210-7 Springer-Verlag London Berlin Heidelberg

British Library Cataloguing in Publication Data
Experimental robotics VI. - (Lecture notes in control and
Information sciences ; 250)
1. Robotics - Congresses
I. Corke, Peter I., 1959- II. Trevelyan, James P.
629.8'92
ISBN 1852332107

Library of Congress Cataloging-in-Publication Data
A catalog record for this book is available from the Library of Congress

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Printed in Great Britain

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Typesetting: Camera ready by contributors
Printed and bound at the Athenæum Press Ltd., Gateshead, Tyne & Wear
69/3830-543210. Printed on acid-free paper SPIN 10718605

Preface

Robotics experiments are complex, require multiple skills and frequently large teams of people, and are often expensive. These factors combined means that relatively little experimentation occurs in the field of robotics. To redress this issue the first International Symposium on Experimental Robotics was held in Montreal in 1989. Subsequent meetings have been held every two years in a rotating sequence through North America, Europe and Asia. The symposia seek to extend the field of robotics by experimentally validating theoretical results, and conversely by experimentation determining the limitation of current theory.

The symposia are small but very special conferences and this one was no exception. It brought together many of the world's leading researchers in a small and intimate conference, small enough for everyone to meet each other. The papers in this volume represent the best of the world's contemporary robotics research in a small and compact volume, and form an essential part of any collection for research institutions, even individual researchers. The papers are presented in a highly readable and accessible form, with plenty of references and contact information to obtain further details.

After the delightful banquet cruise on Sydney harbour most of the delegates were gathered together near the famous Opera House, waiting for a bus to take them back to their hotels. A passer-by asked them "what are you people trying to achieve?" The response was remarkable: all the delegates were lost for words, even though many had taken various drinks which significantly eased their usual inhibitions on speaking out of turn.

Robotics research is in trouble. The era of 'intelligent machines' proclaimed three decades ago has not materialized, and robotics researchers are anxiously looking behind and around themselves, worried that robots are not becoming the ubiquitous machines some people thought they might become by now. We still do not know how to make the 'intelligence' and the machines may need to become more reliable and powerful to achieve the independence needed for full autonomy.

At the 1997 conference on Field and Service Robots held in Canberra Hugh Durrant-Whyte commented "In the past 15 years remarkably little progress has been achieved by the robotics research community. We end up developing systems in which the original theory, techniques and technology are often too fragile, too expensive and inappropriate for industrially-hard application".

One of us (JPT) has made similar comments to students for the last 10 years, posing the question "Where are all the robots which forecasts predicted 20 years ago? Why are there so (relatively) few robots being used?"

As robotics researchers look back on the last two decades, it is often difficult to see where the results of their work have led. Funding agencies have had similar reservations, except perhaps in Japan where the government has embarked on a seven year programme to develop "humanoid robots".

However, this is merely a problem of perceptions and definitions. While few of the innovations which emerge from our work ever appear in the form of robots, or even parts of robots, our results are widely applied in industrial machines which we choose not to define as robots: a common example is the use of computer vision for industrial measurement and inspection. We often find that our robotics research leads not to robots, but better tools which extend the abilities of human workers to the point where they surpass the performance of our robots! This makes it difficult for researchers and other people to understand and appreciate the very significant contributions which emerge from this work.

Many of the papers in this conference describe machines which will never become commonplace. However, many of the solutions needed to make these machines work will become a commonplace, yet largely invisible testament to the efforts reported here.

The program committee for the 1999 meeting comprised:

Alicia Casals	Spain	Raja Chatila	France
Peter Corke	Australia	John Craig	U.S.A.
Paolo Dario	Italy	Vincent Hayward	Canada
Gerd Hirzinger	Germany	Oussama Khatib	U.S.A.
Jean-Pierre Merlet	France	Yoshihiko Nakamura	Japan
Daniela Rus	U.S.A.	Kenneth Salisbury	U.S.A.
Joris De Schutter	Belgium	James Trevelyan	Australia
Tsuneo Yoshikawa	Japan		

We are grateful to the University of Sydney for providing the wonderful environment in which the meeting was held. On behalf of all participants we would like to thank the local arrangements team of Hugh Durrant-Whyte, Lyn Kennedy, David Rye, Eduardo Nebot, Celia Bloomfield and Anna McCallan. Special thanks also to Ms Cuc Tran of CSIRO for assistance with manuscripts, and to our sponsors CSIRO Manufacturing Science and Technology and the Australian Centre for Field Robotics.

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