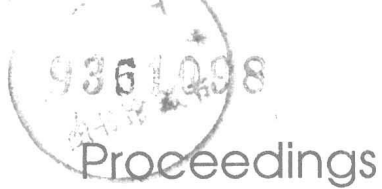


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1991 IEEE International Conference on Robotics and Automation

April 9 - 11, 1991

Sacramento, California



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IEEE Computer Society Press
Los Alamitos, California

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Published by

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IEEE Computer Society Press Order Number 2163
Library of Congress Number 90-85781
IEEE Catalog Number 91CH2969-4
ISBN 0-8186-2163-X (paper)
ISBN 0-8186-6163-1 (microfiche)
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Editorial Production: Catherine Harris, Anne Copeland and Lisa O'Conner
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Printed in the United States of America by Victor Graphics Inc.



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Foreword

The 1991 International Conference on Robotics and Automation is the seventh symposium sponsored by the Robotics and Automation Society. This three-day technical program covers recent advances in all aspects of robotics and manufacturing automation. A record number of 785 papers were submitted to the Technical Program Committee for consideration. The Committee selected the final papers in an all-day meeting December 1, 1990, in St. Louis, Missouri. These selections were based on two external reviews for each paper and recommendations of the Committee in a review process prior to the meeting. Of the 420 papers selected, 60 were invited papers. This represents a 50% acceptance ratio for the contributed papers.

Presenting this many papers required nine parallel tracks, with four sessions per track on each day. Each track is composed of four papers. Three panel discussions were also organized, comprising a total of 108 sessions for the three-day program, the largest ever in the seven-year history of the conference. We believe that the strong technical quality of the submitted papers and the hard work of the TPC members in assembling this program contribute greatly to the conference's tradition of excellence.

A conscientious effort was made to balance the program among theoretical development, experimentation, robotics, and manufacturing automation aspects. The broad scope of the invited sessions reflects this effort. In addition, two plenary sessions and three panel discussions feature international speakers to provide a broad view of robotics and manufacturing in the 90s--the main theme of the conference. The geographic representation of the authors covers 27 countries world-wide.

We are grateful for the assistance from the University of California at Davis and Washington University. We would also like to acknowledge the help of Christina Presswood of Washington University in handling the manuscripts and generating hundreds of letters to the authors.

We also want to extend our special thanks to the members and Vice Chairpersons of the TPC for speedy reviews of the large number of papers, and their dedicated efforts in making the final selections. Above all, a special thanks is owed to all the authors who have contributed their research works and participation at the conference.

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Program At A Glance

Session #	I	II	III	IV	V	VI	VII	VIII	IX
Time Rooms	Regency A	Regency B	Regency C	Regency D	Regency E	Regency F	Golden State A&B	Big Sur A&B	Carmel A&B
8:00 - 8:45 a.m.	Plenary Session I in Regency B&C Dr. A. Bensoussan, Some Trends in Control and Automation								
Tu A I 9:00 - 10:40 a.m.	Adaptive Control of Robot Manipulators	Force Control for Manipulators	Planning For Robotic Systems	Dynamic Modeling For Manipulators	Analysis of Manufacturing Systems	Robot Vision	Multiple Robotic Systems	Robotic System Planning	Analysis And Control of Manipulators
Tu A II 11:00 a.m. - 12:40 p.m.	Learning Applications	Impedance and Force Control	Mobile Robot Planning	Robot Modeling and Design	Manufacturing Applications	Tactile Sensing	Grasping	Planning Among Moving Obstacles	Control of Redundant Systems
Tu P I 14:20 - 16:00 p.m.	High Level Control of Robotic Systems	Nonlinear Control of Robotic Systems	State Based Method in Motion Planning	Kinematic Analysis and Design	Assembly Planning	Visual Servoing - 1	Design of Multifingered Hands	Path Planning and Collision Avoidance	Redundant Robots - 1
Tu P II 16:20 - 18:00 p.m.	Learning Control - 1	Panel Discussion - 1	Motion Planning and Reasoning	Real-Time Issues in Robotics System Design	Scheduling in Manufacturing Systems	Visual Servoing - 2	Dextrous Manipulators	Collision Avoidance	Redundant Robots - 2
19:00 - 21:00 p.m.	Reception: Regency B&C Hosted by Intel Corporation								
Time Rooms April 10	Regency A	Regency B	Regency C	Regency D	Regency E	Regency F	Golden State A&B	Big Sur A&B	Carmel A&B
W A I 9:00 - 10:40 a.m.	Estimation and Learning in Robotic Systems	Coordination of Multiple Industrial Robots	Geometry Based Path Planning	Mechanism Design and Kinematics	Practical Scheduling of Manufacturing Systems	Stereo Vision	Robot Languages	Feedback Control of Nonholonomic Mobile Robots	Computational Algorithms for Robot Arms
W A II 11:00 a.m. - 12:40 p.m.	Robot Control - 1	Force Control for Non-Rigid Manipulators	Kinematics and Motion Planning	Robot Design - 1	Modeling of Manufacturing Systems	Intelligent VLSI Based Robotic Sensors	Industrial Applications	Mobile Robot Control - 1	Software/ Simulation Techniques
W P I 14:20 - 16:00 p.m.	Learning Control - 2	Force Control	Path Planning	Robot Design - 2	Intelligent Sensing and Control for Factory Automation	Object Recognition - 1	Micro Devices	Panel Discussion - 2	Experimental Results in Robotics
W P II 16:20 - 18:00 p.m.	Adaptive Control of Manipulators	Control of Robotic Systems	Motion Planning With Uncertainty	Robotic Applications of the Spatial Operator Algebra	Routing and Scheduling in Flexible Production Systems	Object Recognition - 2	Control Architectures	Panel Discussion - 3	Experiments in Robot Control
20:00 p.m.	Conference Banquet: Regency Ball Room Banquet Speaker: Dr. Craig R. Barter, Executive Vice President Intel Corporation								
Time Rooms April 11	Regency A	Regency B	Regency C	Regency D	Regency E	Regency F	Golden State A&B	Big Sur A&B	Carmel A&B
8:00 - 8:45 a.m.	Plenary Session II in Regency B&C Professor Hirofumi Mura, What is the Intelligence of Robots								
Th A I 9:00 - 10:40 a.m.	Modeling and Control of Manipulators	Distributed Intelligent Robotic Systems	Path Planning/ Applications	Programming Environment for Computer Integrated Manufacturing	Vision for Navigation	Telerobotics - 1	Applications	Legged Locomotion	Free Space Control of Multi Links Flexible Manipulators
Th A II 11:00 a.m. - 12:40 p.m.	Adaptive Control	Optical Design and Kinematics	Kinematics	Integrated Manufacturing Systems	Sensory Feedback	Telerobotics - 2	Sensory Applications	Mobile Robot Control - 2	Modeling of Multi-Linked Flexible Manipulators
Th P I 14:20 - 16:00 p.m.	Robot Control - 2	Application of Neural Networks	Neuromorphic Control and Identification of Robots	Automatic Assembly Modeling and Implementation	Navigation	Space Manipulators	Pattern Modeling in Manufacturing Systems	Mobile Robots	Control of Flexible Objects
Th P II 16:20 - 18:00 p.m.	Robot Control - 3	Neural Networks	Kinematic Analysis	Inspection and Automated Manufacturing	Sensor Fusion	Underwater Robotics	Diagnostics	Mobile Robot Navigation	Flexible Manipulators

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