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Preface

Experimental Robotics II - The Second International Symposium took place in Toulouse, France in June 1991. It was the second in a series after the first meeting in Montréal in June 1989, organized by Vincent Hayward and Oussama Khatib. The next conference will be held in 1993 in Kyoto, Japan, and chaired by T. Yoshikawa and F. Miyazaki.

Hence the meetings circulate every two years around North America, Europe, and Asia. The objective of this series of symposia is to present and discuss in depth research results and on-going developments in Robotics which have theoretical foundations *and* experimental validations.

Indeed, a robot is a machine in permanent interaction with the environment. The influence of this interaction on its actual behavior is fundamental and is often ill known in advance (e.g., external friction), and cannot be simulated correctly *a priori* (e.g., vision) because of its non deterministic nature or various errors, uncertainties and artefacts.

Robotics is a domain in which the implementation of the theories, methods and algorithms on a physical machine with its sensing, acting and computing capacities - and its real-time and real world constraints - is a fundamental part of the research work. It is not only an important step to sort out what is theoretically possible from what is actually feasible. The concepts themselves must be designed with their implementation in mind. Robotics without robots is maybe Control Theory, Computer Science, Mechanics, Geometric Reasoning, but not Robotics.

The papers presented at ISER and collected in this volume are hence in the very core of robotics research. A total of 38 papers from 13 countries are included in this volume covering the field of Robotics. The book is divided into ten sections corresponding to the ten sessions of the Symposium. The limited number of participants (about eighty) permitted very fruitful and high quality exchanges and discussions.

The meeting was opened by Prof. Alain Costes, Director of LAAS. The keynote lecture was given by Prof. Bernie Roth from Stanford University who got the participants immediately to work on the design of a mechanical system, elegantly showing the important role of experimentation. It was concluded by a closing address by Dr. Georges Giralt from LAAS, who stressed his creed on the importance of experimentation in Robotics.

In addition to the proceedings, a compilation of video segments illustrating the reported research is available.

The international permanent program committee was composed of R. Chatila, *LAAS-CNRS*, France, J. Craig, *Silma*, USA, P. Dario, *Scuola Superiore S. Anna*, Italy, B. Espiau, *ISIA/Ecole des Mines*, France, G. Hirzinger, *DFVLR*, Germany, V. Hayward, *McGill University*, Canada, O. Khatib, *Stanford University*, USA, F. Miyazaki, *Osaka University*, Japan, K. Salisbury, *MIT*, USA, T. Yoshikawa, *Kyoto University*, Japan, and chaired this year by R. Chatila and G. Hirzinger. J-P. Merlet, *INRIA*, France, has since replaced B. Espiau.

The meeting was hosted by LAAS-CNRS and supported by several institutions and companies: Canadian Space Agency / Agence Spatiale Canadienne (C.S.A. / A.S.C., Ottawa, Ontario), Centre National de la Recherche Scientifique (C.N.R.S., Paris), Commissariat à l'Energie Atomique (CEA, Fontenay-aux-Roses), Conseil Général de la Haute-Garonne (Toulouse), Centre de Robotique Intégrée d'Ile de France (Paris), Laboratoire d'Automatique et d'Analyse des Systèmes (L.A.A.S.-C.N.R.S., Toulouse), Matra-Espace (Vélizy), National Science Foundation, Washington D.C., Mairie de Toulouse, Région Midi-Pyrénées (Toulouse).

The meeting could not have taken place without the organizational talent of Mrs Marie-Thérèse Ippolito, and the work and kind availability of Mrs Jackie Som and Nicole Vergriette to whom we are thankful.

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