

Preface

Record-keeping and decision-making in industry and government are widely and increasingly based on computerized data bases. Hence the need for improved hardware and software technology for building, managing and using these data bases is becoming ever more important.

Data base techniques are also expanding into many novel environments and application areas, such as office systems, knowledge-based systems, Computer Aided Design/Computer Aided Manufacturing, and geographical and statistical information systems. These new environments give emphasis to a number of emerging research and development problems, such as sophisticated user interfaces, management of unformatted data, and voice and image processing.

The purpose of this ninth Conference of the Very Large Data Bases series is to provide an international forum for the promotion of an understanding of current research, and the exchange of ideas, experiences and future directions in database systems.

These Proceedings contain the 34 papers and the 10 abstracts selected for the Conference from over two hundred submitted contributions, covering a wide range of subjects such as database system design and implementation, database control, user interfaces, distributed databases, modeling and managing of unformatted data. This collection of papers offers a comprehensive and penetrating analysis of the current fundamental issues in databases systems, and represents an incentive for further research in the area. The number and quality of the papers submitted reflect the importance that data base and related systems have assumed in practical applications, and confirm the high level of interest that the field is experiencing in the international computer science research community.

The Conference program has been prepared by a Committee of 36 well known experts: in selecting the papers, the Program Committee had also the help of many external referees. We wish to thank all of them for their dedication and professionalism.

Major credit for the success of the Conference must be given to all our colleagues who submitted papers for consideration, and to those who have organized and will participate in panel sessions.

During the Conference, nobody's absence will be more strongly and deeply felt than Tony Klug's. His totally unexpected death at a cruelly young age is a personal bereavement to all. He will not be forgotten. One does not forget a friend with such exceptional personal warmth and helpfulness and with such brilliant intellectual and professional gifts. His abilities were also highly appreciated during the work of our Conference Program Committee.

All the Conference Officers fulfilled their roles with admirable dedication in planning and organizing the event. We wish to thank in particular the Conference Co-Chairmen M. Adiba and S.B. Yao, the Program Coordinator P. Lockemann, the Program Committee Co-Chairmen M. Schkolnick and C. Thanos and the Organizing Committee Chairman R. Pinzani. Many thanks are also due to the treasurers F. Pipolini and A. Hevner, to E. Ricciardi who managed the local arrangements, and to A. Longo and N. Roussopoulos who ensured publicity for the Conference.

Elsewhere the reader will find the names of the Program Committee members and the Organizing Committee members; we gratefully acknowledge their contribution.

We should also like to thank the sponsors:

VLDB Endowment
IFIP International Federation for Information Processing
AFCET Association Française pour la Cybernétique Economique et Technique
AICA Associazione Italiana per il Calcolo Automatico
C.N.R. Consiglio Nazionale delle Ricerche
GI Gesellschaft für Informatik e. V.
INRIA Institut National de Recherche en Informatique et en Automatique
Dipartimento di Elettronica, Politecnico di Milano
Università degli Studi di Firenze
University of Maryland

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who made this Conference possible.

The Conference Organizers are also grateful to the Istituto di Elaborazione dell'Informazione of the Italian National Research Council for providing its professional, administrative and financial support.

We hope that this book will be useful to the database community at large.

GIAMPIO BRACCHI
General Conference Chairman