

Deductive and Object-Oriented Databases

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Editors

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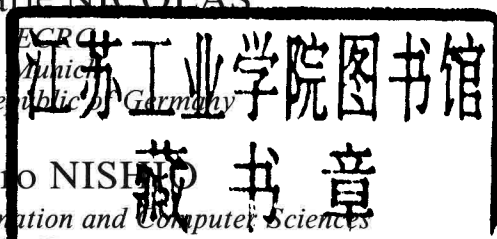
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GENERAL CHAIRPERSON'S MESSAGE

It was my great pleasure to welcome participants to the *First International Conference on Deductive and Object-Oriented Databases* (DOOD89) in Kyoto. The idea of organizing this conference began in Kyoto in February 1988. It was motivated by the importance and need to provide a common forum for technical discussions between researchers working with deductive databases and object-oriented databases, and also the need to integrate these very advanced databases in order to accelerate research in investigating next generation intelligent database systems.

Thanks to the hearty cooperation of numerous people, the preparation of the conference progressed admirably under the sponsorship of IPSJ and ASTEM RI/Kyoto, with the cooperation of ACM SIGMOD, IEEE CS and many other organizations as well as with the collaboration of some important next generation computer projects around the world, such as ECRC, ICOT, INRIA, and MCC. I do not know how to express my sincere thanks to them for putting our plan into practice and keeping it at the centre of public attention.

We have now arrived at a very important stage in investigating the topics of the conference by reviewing studies made in the past. As one of the most active researchers in pursuit of this theme, we invited Dr. K. Fuchi to present a keynote address. We were very fortunate that Dr. Fuchi accepted our invitation and gave us the attractive address entitled *Towards a New Step of Logic Paradigm*.

Three invited papers by Dr. C. Zaniolo, Dr. F. Bancilhon et al., and Professor C. Beeri were presented along with the 27 very high quality papers selected from the total number of submitted papers. I feel that these papers form a strong technical basis for the topics of the conference, and their full text together with the abstract of the keynote address are included in this volume. The panel session chaired by Dr. M.L. Brodie complemented the contributed paper sessions and provided an opportunity for exchanging views on *Next Generation Database Management Systems*.

On behalf of the DOOD89 participants, I would like to thank all those who gave their talents and time to assure the success of the conference meeting. In particular, I would like to express my deep appreciation to Dr. W. Kim, Dr. J.-M. Nicolas, and Professor S. Nishio, the Program Co-Chairpersons. Without their initiative and dedicated service in all phases of the conference, DOOD89 would not have existed. I would like to express my sincere thanks to Professor J. Minker, the Steering Committee Chairperson, and the members of the Committee for providing us with the opportunity of holding the conference in Kyoto. The majority of the credit for the high quality of the program is due to the many authors who submitted papers, to our colleagues on the Program Committee who spent many hours reviewing the papers, and the external reviewers who willingly shared their expertise on specific papers. We extend our heartfelt thanks to all of them. Particular thanks must go to Professor A. Makinouchi, the Executive Committee Chairperson, and the members of the Committee who handled all other affairs besides the technical program. Finally sincere thanks and appreciation are also extended to the members of the Organizing Committee for making the conference actually happen and to our industrial supporters for their financial assistance.

Yutaka Ohno
General Chairperson

PROGRAM COMMITTEE CHAIRPERSONS' MESSAGE

Deductive databases and object-oriented databases have been at the forefront of research into next generation intelligent database systems. Object-oriented programming and design methodologies hold great promise for reducing the complexity of very large software systems in such domains as computer-aided design and manufacturing, integrated office information systems, and artificial intelligence. Object-oriented database systems will enhance the programmer/user productivity of such systems. Research into deductive databases is aimed at discovering efficient schemes to uniformly represent assertions and deductive rules, and to respond to highly expressive queries against the knowledge base of assertions and rules. This area of research strongly interacts with Logic Programming which has developed in parallel, sharing Logic as a common basis. Recently, research has been aimed at integrating object-oriented paradigms and rule-based deduction to provide a single powerful framework for intelligent database systems.

The primary objective of the conference meeting was to provide a forum for technical discussions among researchers working with deductive databases and object-oriented databases, in the hope of accelerating progress in these areas of research and also to promote research into the integration of the technical output of these areas of research.

The technical program of the conference consisted of 30 technical papers and one technical panel session. The technical papers represent the 27 papers which were accepted by the three program committees from 82 submitted articles, and three invited papers.

We would like to thank all the people who made the conference possible, including all the members of the program committees, the external reviewers, and the database professionals who submitted technical papers to the conference. We are especially grateful to our industrial supporters for providing financial assistance. Finally, we owe special thanks to Ms. Ikuko Miyazaki of the SCI Corporation for the numerous days she spent in preparing this volume.

Won Kim, Jean-Marie Nicolas, and Shojiro Nishio
Co-Chairs, Program Committee

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KEYNOTE ADDRESS

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Towards a New Step of Logic Paradigm

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ABSTRACT

One of the motivations of the FGCS Project was to integrate two areas: programming and database. It was inspired by the appearance of relational data model and logic programming, and also by the research on deductive databases as one of the earliest attempts to combine the two areas. We thought the logic-based approach was the best way to integration.

Another motivation was to fuse ideas from logic programming, functional programming and object-oriented programming. These three are essentially variations of logic programming in a broader sense. So they should naturally be unified on a common basis.

The directionality was simple and clear. However, research done in the last 10 years all over the world have shown that there are plenty of research problems on the way. Meanwhile, there has been a tendency of divergence in research activities. However, I strongly feel that the time is coming again to be conscious of grandunification based on materials enriched by the process of divergence and convergence.

For example, in the field of logic programming there have been trials of extending terms, as well as trials of constraint paradigms. There have some points of contact with the object-oriented approach. The same trials have been done from the viewpoint of database extension. One of the activities toward integration based on a variety of ideas is the research on deductive and object-oriented databases.

A number of ideas have been conceived in the last 10 years, and a lot will come from now on. There seems no definite consensus about the concrete scheme of integration at this moment. However, we will find a way to integration by clarifying the relationships between a variety of ideas. Experience in knowledge processing and natural language processing as well as in realistic applications of some scale will accelerate this movement.

To realize this idea, it is critically important for researchers of related fields to have consciousness to pursue unity in variety, instead of seeking only differentiation.