

## Foreword

The 22nd International Conference on Conceptual Modeling (ER 2003) returned to Chicago after an absence of 18 years. Chicago, a city well known for its trendsetting and daring architecture, has met the new century with a renewed commitment to open public spaces and human interaction. Thus it provided a fitting venue for ER 2003, the scope of which was expanded to encompass all aspects of conceptual modeling in order to deal with constantly changing information technology and business practices and to accommodate a new openness in connecting systems to each other and to human users.

The ER 2003 Program Co-chairs, Il-Yeol Song, Stephen Liddle, and Tok Wang Ling, along with an outstanding Program Committee assembled one of the finest technical programs of this conference series. In keeping with the tradition of previous ER conferences, the program for ER 2003 also included four preconference workshops, two preconference tutorials, two conference tutorials, two panels, and a demos and poster session. The Program Co-chairs, as well as Manfred Jeusfeld and Óscar Pastor (Workshop Co-chairs), Ee-Peng Lim and Tobey Teorey (Tutorial Co-chairs), Avigdor Gal and Elisa Bertino (Panel Co-chairs), and Heinrich Mayr (Demos and Poster Chair), deserve our appreciation for an excellent job. It was a pleasure working with all of them.

I was extremely lucky to work with Kathi Hogshead Davis, the Organizing Chair, who along the road also took on the role of Treasurer, and gracefully ended up doing more work than she originally contracted for. Bamshad Mobasher was an energetic Local Arrangements Chair, and Rokia Missaoui gave very helpful service as Publicity Chair. I thank them and all the other members of the Organizing Committee for their dedication and professionalism.

I also express my sincere appreciation to the members of the ER Steering Committee, in particular to David Embley (Chair), Bernhard Thalheim (Vice-Chair), Jacky Akoka (ER2003 Liaison), and Peter Chen (Emeritus) for their continuing advice and vision.

Thanks are due too to all the sponsors for their support. And to all the attendees who contributed to the success of this conference, I am confident that you found the program of ER 2003 to be exciting and that our meeting, combined with the city of Chicago, provided a memorable experience for all of you.

# Preface

The 22nd International Conference on Conceptual Modeling (ER 2003) was held in Chicago, Illinois, October 13–16, 2003. The annual ER conference provides a forum for presenting and discussing current research and applications in which conceptual modeling is the major emphasis. Since its inception in 1979, the ER conference has become the most prestigious scientific conference covering conceptual modeling research and applications. The theme of ER 2003 was “conceptual modeling for the future.” The purpose of the conference was to identify challenging problems facing conceptual modeling of future information systems and to shape future research directions by soliciting and reviewing high-quality applied and theoretical research contributions. We solicited forward-looking and innovative papers that identified promising areas for future conceptual modeling research as well as traditional approaches to analysis and design theory for information systems development.

The call for papers resulted in 153 excellent submissions of research papers from more than two dozen countries. Due to space limitations, we were only able to accept 38 papers from 19 countries, for an acceptance rate of 24.8%. Inevitably, many good papers had to be rejected. The accepted papers covered topics such as ontologies, patterns, workflow, metamodeling and methodology, innovative approaches to conceptual modeling, foundations of conceptual modeling, advanced database applications, systems integration, requirements and evolution, queries and languages, Web application modeling and development, schema and ontology integration, and data mining.

We were pleased with the quality of this year’s program, from the keynote speeches to the workshops, panels, tutorials, industrial papers, and research papers. Many people helped make ER 2003 successful. We appreciated the outstanding keynote addresses by the renowned scholars Erich Neuhold, Stuart Madnick, and Michael Carey, and we thank James Odell for his excellent industrial keynote speech. We appreciate the diligent work of the organizing committee. Most of all, we are extremely grateful to the program committee members of ER 2003 who generously spent their time and energy reviewing submitted papers. We also thank the many external referees who helped with the review process. Finally, we thank the authors who wrote strong research papers and submitted them to ER 2003.

October 2003

Il-Yeol Song  
Stephen W. Liddle  
Tok Wang Ling

# ER 2003 Conference Organization

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Kathi Hogshead Davis, Northern Illinois University, USA

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Tok Wang Ling, National University of Singapore, Singapore

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Óscar Pastor, Polytechnic University of Valencia, Spain

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Rokia Missaoui, University of Quebec, Canada

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Elisa Bertino, University of Milan, Italy

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Bamshad Mobasher, DePaul University, USA

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**Emeritus:** Peter P. Chen, Louisiana State University, USA

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Eric Yu, University of Toronto, Canada  
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Esteban Zimanyi, ULB, Belgium

## External Referees

Samuil Angelov  
Maria Bergholtz  
Stefano Borgo  
Sven Casteleyn  
Li Chen  
Wan-Sup Cho  
Cecil Eng Huang Chua  
Daniela Damm  
Michael Derntl  
Pascal van Eck  
Li Feng  
Renato Ferreira  
George Feuerlicht  
Ed Glantz  
Matteo Golfarelli  
Mathias Goller  
Cesar Gonzalez Guido Governatori  
Ramanathan Guha  
Giancarlo Guizzardi  
Farshad Hakimpour  
Sari Hakkarainen  
Jean Henrard  
Mauricio Hernandez  
Teruhisa Hochin  
Anne Hoffmann  
Zhengrui Jiang  
Zoubida Kedad  
Maurice van Keulen  
Vijay Khatri  
Henry Kim  
Stephen Kimani  
Subodha Kumar  
Juliano P. Lage  
Stephan Lechner  
Sang-Ho Lee  
Maurizio Lenzerini  
Jiuyong Li  
Xue Li  
Yun Lin  
Chengfei Liu  
Zhenyu Liu  
Federica Mandreoli  
Renata de Matos Galante  
Raimundas Matulevicius  
Ibrahim Mescioglu  
Gillian Miller  
Ralf Muhlberger  
Jeffrey Parsons  
Vanessa de Paula Braganholo  
Vicente Pelechano  
Günter Preuner  
Shazia Sadiq  
Jennifer Sampson  
Giuseppe Santucci  
Monica Scannapieco  
Isamu Shioya  
Masataro Shiroya  
Anastasiya Sotnykova  
Darijus Strasunskas  
Markus Stumptner  
Hong Su  
Yong Tan  
Philippe Thiran  
Takashi Tomii  
Arvind Tripathi  
Karthikeyan Umapathy  
Petko Valtchev  
Yannis Velegarakis  
Csaba Veres  
Fusheng Wang  
Melanie Weis  
Lingling Yan  
Liang-Huai Yang  
Li Xu  
Jeffrey Xu Yu  
Yijun Yu  
Zhongju Zhang  
Huimin Zhao

## Tutorials

### **Object-Process Methodology and Its Application to the Visual Semantic Web**

Dov Dori, Technion, Israel and MIT, USA

### **Data Modeling Using XML**

Murali Mani, UCLA, USA

Antonio Badia, University of Louisville, USA

### **Understanding Metamodeling**

Brian Henderson-Sellers, Sydney University of Technology, Australia

### **Data Analytics for Customer Relationship Management**

Jaideep Srivastava, University of Minnesota, USA

## Workshops

### **eCOMO 2003**

4th International Workshop on Conceptual Modeling Approaches for E-Business

**Co-chairs:** Heinrich C. Mayr, University of Klagenfurt, Austria

Willem-Jan van den Heuvel, Tilburg University, The Netherlands

### **IWCMQ 2003**

International Workshop on Conceptual Modeling Quality

**Co-chairs:** Marcela Género, University of Castilla-La Mancha, Spain

Jim Nelson, Ohio State University, USA

Geert Poels, Ghent University, Belgium

### **AOIS 2003**

5th International Workshop on Agent-Oriented Information Systems

**Co-chairs:** Paolo Giorgini, University of Trento, Italy

Brian Henderson-Sellers, University of Technology, Sydney

### **XSDM 2003**

International Workshop on XML Schema and Data Management

**Chair:** Sanjay K. Madria, University of Missouri-Rolla, USA

See LNCS vol. 2814 for the workshop proceedings.