

# Preface

This volume provides a comprehensive, state-of-the-art survey of conceptual modeling. It includes invited papers, research papers, and abstracts of industrial presentations given at ER2000, the 19th International Conference on Conceptual Modeling, held in Salt Lake City, Utah. Continuing in its long tradition of attracting the leading researchers and practitioners in advanced information systems design and implementation, the conference provided a forum for presenting and discussing current research and applications in which the major emphasis was on conceptual modeling. The conference topics reflected this strong conceptual-modeling theme while recognizing important, emerging developments resulting from recent technological advances.

The call for papers for the research track resulted in the submission of 140 papers from researchers around the world. Of these, 37 were selected for inclusion in the program. The authors of these papers are from 14 countries. These papers represent a variety of topics including:

- Database Integration
- Temporal and Active Database Modeling
- Database and Data Warehouse Design Techniques
- Analysis Patterns and Ontologies
- Web-based Information Systems
- Business Process Modeling
- Conceptual Modeling and XML
- Engineering and Multimedia Application Modeling
- Object-Oriented Modeling
- Applying Object-Oriented Technology
- Quality in Conceptual Modeling
- Application Design Using UML

Three internationally recognized scholars in the area of conceptual modeling also submitted papers and delivered keynote speeches:

- John Mylopoulos: *From Entities and Relationships to Social Actors and Dependencies*
- Salvatore T. March: *Reflections on Computer Science and Information Systems Research*
- Philip A. Bernstein: *Generic Model Management—Why We Need It and How to Get There*

In addition to the research papers and invited papers, the conference included two workshops, two pre-conference full-day tutorials, four short tutorials, four industrial sessions, and two provocative panel discussions. The workshops addressed emerging topics in conceptual-modeling research. One workshop

was entitled “Conceptual Modeling Approaches for E-Business (eCOMO2000),” and the other was entitled “The World Wide Web and Conceptual Modeling (WCM2000).” The pre-conference tutorials allowed participants to be taught the latest information about using conceptual-modeling techniques to do software development using UML and to do Internet site development using co-design. Scott N. Woodfield taught the UML software development tutorial, while Bernhard Thalheim and Klaus-Dieter Schewe taught the Internet site development tutorial. Short tutorials were taught by Avigdor Gal on utilizing ontologies in e-commerce, by Uma Srinivasan and John R. Smith on conceptual modeling for multimedia applications, by Il-Yeol Song on logical design for data warehousing, and by Benkt Wangler and Paul Johanneson on application and process integration. The industrial sessions were largely sponsored in conjunction with DAMA International and addressed pertinent issues relating to the application of conceptual modeling to solving real-world problems.

Authors who submitted their work and the program committee members and additional reviewers who carefully reviewed the papers and provided their professional assessments deserve appreciation and recognition. A number of the program committee members participated in a rather lengthy virtual meeting to finalize the paper selection and diligently reviewed additional papers on demand, all in an effort to create the best program possible. The PC chairs, Alberto H.F. Laender and Veda C. Storey, labored diligently to provide the best possible research program for ER2000. This volume is a tribute to their efforts. Stephen W. Liddle deserves special thanks for creating the Web-based conference management software that enabled the online submission of papers and reviews, and that made the virtual PC meeting possible. He also worked closely with the PC chairs to manage the review process and assemble the conference proceedings.

Many others deserve appreciation and recognition. The steering committee and conference chair provided advice and vision. Bernhard Thalheim directed the search for timely workshops. Selected workshops were chaired by Heinrich C. Mayr (eCOMO2000) and Stephen W. Liddle (WCM2000) who both worked tirelessly with their program committees to obtain good papers for their respective workshops. (A companion volume, LNCS 1921, contains these papers.) Ling Liu enticed 15 submissions for short tutorials and then had to make hard decisions to cut this list of submissions to the four accepted for the conference. Terry Halpin worked diligently as industrial chair, eventually joining forces with Davida Berger, Vice President of Conference Services for DAMA International, to jointly come up with an outstanding industrial track. Il-Yeol Song continuously provided publicity for the conference; John F. Roddick worked on panels; Scott N. Woodfield handled local arrangements, and Stephen W. Liddle kept the Web pages up to date and artistically presentable. Dennis Ng (registration), Douglas M. Campbell (socials), Dan Johnson and Jennifer Shadel (treasurers), and several BYU students also helped make the conference a success.

# ER2000 Conference Organization

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David W. Embley, Brigham Young University, USA

## **Program Co-Chairs**

Alberto H. F. Laender, Universidade Federal de Minas Gerais, Brazil

Veda C. Storey, Georgia State University, USA

## **Workshops Chair**

Bernhard Thalheim, Brandenburg Technical University at Cottbus, Germany

## **Tutorials Chair**

Ling Liu, Georgia Institute of Technology, USA

## **Industrial Chair**

Terry Halpin, Microsoft Corporation, USA

## **Publicity Chair**

Il-Yeol Song, Drexel University, USA

## **Panels Chair**

John F. Roddick, Flinders University of South Australia, Australia

## **DAMA International Liaison**

Davida Berger, Roche Labs Inc., USA

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**Local Arrangements:** Scott N. Woodfield, Brigham Young University, USA

**Registration:** Yiu-Kai (Dennis) Ng, Brigham Young University, USA

**Webmaster:** Stephen W. Liddle, Brigham Young University, USA

**Social:** Douglas M. Campbell, Brigham Young University, USA

**Treasurer:** Dan Johnson, Brigham Young University, USA

**Treasurer:** Jennifer Shadel, Brigham Young University, USA

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**Chair:** Bernhard Thalheim, BTU Cottbus, Germany

**Vice-Chair & ER2000 Liaison:** Tok Wang Ling, NUS, Singapore

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

## **AREA LIAISONS**

**Asia:** Tok Wang Ling, National University of Singapore, Singapore

**Australia:** John F. Roddick, Flinders University of South Australia, Australia

**North America:** Sudha Ram, University of Arizona, USA

**South America:** José Palazzo de Oliveira, Federal University of Rio Grande do Sul, Brazil

**Europe:** Stefano Spaccapietra, Ecole Polytechnique Federale de Lausanne, Switzerland

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Tok Wang Ling, National University of Singapore, Singapore  
Salvatore T. March, Vanderbilt University, USA  
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Elisabeth Metais, University of Versailles, France  
Takao Miura, Hosei University, Japan  
Renate Motschnig-Pitrik, University of Vienna, Austria  
John Mylopoulos, University of Toronto, Canada  
Sham Navathe, Georgia Institute of Technology, USA  
Daniel O'Leary, University of Southern California, USA  
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Alain Pirotte, Catholic University of Louvain, Belgium  
Niki Pissinou, University of Southwestern Louisiana, USA  
Sandeep Purao, Georgia State University, USA

Sudha Ram, University of Arizona, USA  
 John Roddick, Flinders University of South Australia, Australia  
 Sumit Sarkar, University of Texas at Dallas, USA  
 Arne Solvberg, Norwegian Institute of Technology, Norway  
 Il-Yeol Song, Drexel University, USA  
 Vijayan Sugumaran, Oakland University, USA  
 Mohan Tanniru, Oakland University, USA  
 Toby Teorey, University of Michigan, USA  
 Bernhard Thalheim, Brandenburg Technical University at Cottbus, Germany  
 Olga De Troyer, Tilburg University, The Netherlands  
 Kyu-Young Whang, KAIST, Korea  
 Michael Williams, Manchester Metropolitan University, UK

## External Referees

Stephen Arnold	Mihhail Matskin
Maria Bergholtz	Giansalvatore Mecca
Stephane Bressan	Paolo Merialdo
Diego Calvanese	Sophie Monties
Cecil Eng Huang Chua	Luciana Porcher Nedel
Angelo E. M. Ciarlini	Sanghyun Park
Robert M. Colomb	Ilias Petrounias
Gillian Dobbie	Alysson Bolognesi Prado
Laurent Ferier	Torsten Priebe
Thomas Feyer	Ivan Radev
Renato Fileto	Srinivasan Raghunathan
Rakesh Gupta	Wasim Sadiq
Hyoil Han	Giuseppe Santucci
Gaby Herrmann	Klaus-Dieter Schewe
Patrick Heymans	T. Schlichting
Ryosuke Hotaka	Joachim W. Schmidt
David Johnson	Junho Shim
Masayuki Kameda	Isamu Shioya
Gilbert Karuga	Roderick Son
Hirofumi Katsuno	Eng Koon Sze
Hiroyuki Kitagawa	Hideyuki Takada
Birgitta Koenig-Ries	Hiroki Takakura
Takeo Kunishima	Babis Theodoulidis
Dongwon Lee	Hallvard Traetteberg
Joseph Lee	Meng-Feng Tsai
Weifa Liang	Vassilios S. Verykios
Victor Liu	Bing Wu
Wenlei Mao	Yusuke Yokota

## Tutorials

### **The Unified Modeling Language**

Scott N. Woodfield, Brigham Young University, USA

### **Conceptual Modeling of Internet Sites**

Bernhard Thalheim, Brandenburg Univ. of Technology at Cottbus, Germany  
Klaus-Dieter Schewe, Massey University, New Zealand

### **Utilizing Ontologies in eCommerce**

Avigdor Gal, Rutgers University, USA

### **Conceptual Modeling for Multimedia Applications and the Role of MPEG-7 Standards**

Uma Srinivasan, CSIRO Mathematical and Information Sciences, Australia  
John R. Smith, IBM T.J. Watson Research Center, USA

### **Logical Design for Data Warehousing**

Il-Yeol Song, Drexel University, USA

### **Application and Process Integration**

Benkt Wangler, University of Skövde, Sweden  
Paul Johannesson, Stockholm University, Sweden

## Workshops

### **eCOMO2000**

International Workshop on Conceptual Modeling Approaches for E-Business  
**Chair:** Heinrich C. Mayr, University of Klagenfurt, Austria

### **WCM2000**

2<sup>nd</sup> International Workshop on the World Wide Web and Conceptual Modeling  
**Chair:** Stephen W. Liddle, Brigham Young University, USA

See *LNCS* vol. 1921 for the workshop proceedings.