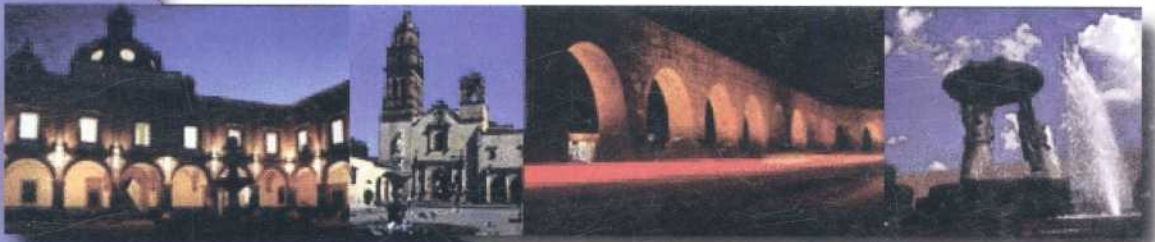




QR2000

14th Int'l. Workshop on Qualitative Reasoning



**Universidad Michoacana de San Nicolás de Hidalgo
Morelia, Michoacán, México.**

QR2000

The Fourteenth International Workshop on
Qualitative Reasoning

QR2000

The Fourteenth International Workshop on
Qualitative Reasoning
5 to 7 June 2000

Edited by

Juan J. Flores

Universidad Michoacana de San Nicolás de Hidalgo

Morelia, Michoacán, México

Parts of this book (complete articles) may be reproduced, for academic purposes only, in any form by any electronic or mechanical means, subject to authorization of the editors.

QR2000

The Fourteenth International Workshop on Qualitative Reasoning

Primera edición mayo del 2000

Derechos reservados conforme a la ley

© Universidad Michoacana de San Nicolás de Hidalgo

Facultad de Ingeniería Eléctrica

ISBN 970-703-012-7

Impreso en México / Printed in Mexico

La presentación y composición tipográfica son propiedad de los editores.
Prohibida la reproducción total o parcial sin permiso de los editores.

Contents

Workshop Organization

Workshop Sponsors

Preface

Homogenising References in Orders of Magnitude Spaces: An Application to Credit Risk Prediction (<i>Núria Agell, Xari Rovira, Carmen Ansotegui, Mónica Sánchez, and Francesc Prats</i>)	1
Using QR to solve quantitative modeling problems: an application to intracellular thiamine kinetics (<i>R. Bellazzi, R. Guglielmann, and L. Ironi</i>)	9
Visualization of Qualitative Models (<i>Anders Bouwer and Bert Bredeweg</i>)	18
Selection of Perturbation Experiments for Model Discrimination (<i>Hidde de Jong, Nicolaas Mars, and Ivayla Vatcheva</i>)	24
Qualitative Simulation of Large and Complex Genetic Regulation Systems (<i>Hidde de Jong and Michel Page</i>)	32
Interactive Semi-Qualitative Simulation (<i>Charles A. Erignac</i>)	40
Qualitative Spatial Interpretation of Course-of-Action Diagrams (<i>Ronald W. Ferguson, Robert A. Rasch, Jr., William Turmel, and Kenneth D. Forbus</i>)	47
Reasoning about Faulty Electrical Circuits (<i>Juan J. Flores and Jaime Cerda</i>)	53
Towards a Computational Model of Sketching (<i>Kenneth D. Forbus, Ronald W. Ferguson, and Jeff Usher</i>)	61
Computing Topological Adjacency Relations between Iso-contours (<i>X. Huang and F. Zhao</i>)	67
Towards Compositional Modelling of Ecological Systems via Dynamic Flexible Constraint Satisfaction (<i>Jeroen Keppens and Qiang Shen</i>)	74
Reinterpretation of Causal Order Graphs Towards Effective Explanation Generation Using Compositional Modeling (<i>T.K. Satish Kumar</i>)	83
Many-Valued Logic and Qualitative Modelling of Electrical Circuits (<i>Mark Lee</i>)	89
Explanation Structures for Complex Qualitative Behavior Graphs (<i>Richard Mallory and Bruce W. Porter</i>)	97
STA: Spatio-Temporal Aggregation with Applications to Analysis of Diffusion-Reaction Phenomena (<i>Iván Ordóñez and Feng Zhao</i>)	104
Searching for similar semiquantitative temporal patterns in time-series databases (<i>J.A. Ortega, R.M. Gasca, and M. Toro</i>)	111
A New Technique for Monte Carlo Generation of Monotonic Functions (<i>A. C. Cem Say</i>)	123
Supporting Model Building Processes for Analysis with Prototypes (<i>Takayuki Sekiya and Tetsuo Tomiyama</i>)	130
First Steps in Formalising Qualitative Systems Dynamics (<i>Neil Smith</i>)	138
Automated Determination of Qualitative Distinctions: Theoretical Foundations and Practical Results (<i>Peter Struss and Martin Sachenbacher</i>)	144
Index	

Workshop Organization

Workshop Cochairs

Juan J. Flores, Universidad Michoacana

Kenneth D. Forbus, Northwestern University

Program Committee

Chris Bailey-Kellogg, Dartmouth College, USA

Gautam Biswas, Vanderbilt University, USA

Liz Bradley, University of Colorado, USA

Bert Bredeweg, University of Amsterdam, Netherlands

Johan de Kleer, Xerox Corporation, USA

Juan Flores, Universidad Michoacana, Mexico

Kenneth D. Forbus, Northwestern University, USA

Yoshiteru Ishida, Toyohashi Univ. of Tech., Japan

Liliana Ironi, IAN - CNR, Italy

Benjamin Kuipers, University of Texas at Austin, USA

Toyoaki Nishida, Nara Institute of Science and Tech., Japan

Chris Price, University of Wales, UK

Qiang Shen, University of Edinburgh, UK

Peter Struss, Technical University of Munich, Germany

Stefania Tentoni, IAN - CNR, Italy

Tetsuo Tomiyama, University of Tokyo, Japan

Franz Wotawa, Technical University of Vienna, Austria

Ken Yip, MIT, USA

Feng Zhao, Xerox PARC - Ohio State Univ., USA

Local Arrangements Committee

Juan J. Flores

Georgina Díaz

Federico González

Workshop Sponsors

Universidad Michoacana de San Nicolás de Hidalgo

Facultad de Ingeniería Eléctrica

American Association for Artificial Intelligence

Monet – The European Network of Excellence in Model-Based Systems & Qualitative Reasoning

Centro de Investigación y Desarrollo del Estado de Michoacán

Multisistemas de Cómputo

Preface

In the last couple of years, the Qualitative Reasoning Workshop was run in conjunction with the Workshop on Principles of Diagnosis. This provided both communities a good opportunity to interact with each other, learn what the intersection of the two fields is, and apply techniques of one field to the other. In this cooperation there was never the intention to fuse both fields, but to enrich each other. So, this year the QR Committee decided to run the workshops independently, although still co-located in space and back-to-back in time.

Plans are to co-locate the workshop next year with the conference “Artificial Intelligence in Education”, which will take place in Texas, USA. Again, we hope that the interaction with other community can bring us insight, help QR techniques spread to other fields, and recruit new scientists.

We would like to acknowledge the Committee members who spent a good amount of time and effort in the review process. Thanks to Chris Bailey, Liz Bradley, Johan deKleer, Art Farley, Juan Flores, Ken Forbus, Liliana Ironi, Yoshiteru Ishida, Ben Kuipers, Toyoaki Nishida, Chris Price, Qiang Shen, Peter Struss, Stefania Tentoni, Franz Wotawa, and Feng Zhao.

Last but not least, we would like to recognize the work of the Local Arrangements Committee, specially Gina Díaz, who had the added a good-taste touch to all details. Many thanks to Cuauhtémoc Rivera, for the graphics design and web mastering.

Juan Flores and Ken Forbus
June 5, 2000