Preface

The Qualitative Reasoning (QR) Workshop is the annual international forum for presenting and discussing recent research development in theories, methods, and applications of Qualitative Reasoning about both physical and nonphysical systems and processes. This collection contains the working papers presented at the Twelfth Workshop (QR-98) held in Cape Cod, Massachusetts, USA from May 26 through May 29, 1998.

Qualitative Reasoning is an exciting research area of Artificial Intelligence that combines the quest for fundamental understanding of effective reasoning about physical systems and new ways to supplement conventional modeling, analysis, diagnosis, and control techniques to tackle real-world applications. While preserving the informal and intimate character of the QR workshops, this year's Workshop introduces several important changes to maintain its health and vitality:

For the first time the Qualitative Reasoning Workshop is collocated with the Principles of Diagnosis Workshop (DX) cochaired by Pandu Nayak and Brian Williams. We have encouraged submissions on the topics of interest to both QR and DX researchers. The result is a set of papers selected by QR/DX committees to be presented at the joint sessions with DX.

We have broadened the workshop topics to encourage exploratory work in new application areas and in areas that integrate or interface QR with conventional techniques in science and engineering. Following the success of the System Identification tutorial at the Cortona, Italy Workshop (QR-97), we have invited experts from other areas such as cognitive modeling (in planning), planning and decision making involving discrete-time stochastic dynamical systems (Tom Dean and Sonia Leach), and control and hybrid systems (in planning) to overview fundamental methods and new results in these areas. We believe that QR researchers could benefit from exposures to these areas that study interesting problems in modeling and reasoning about physical and nonphysical systems, and hope the tutorials will lead to two-way research exchanges between QR and these other communities.

This year, we have received a total of 28 submissions. Each submitted paper is reviewed by two Program Committee members and a final acceptance decision is made based on the reviews.

We thank the QR Program Committee members for their hard work in reviewing the submissions and helping planning the workshop, and Chris Price and Pandu Nayak for their help in selecting the QR/DX joint session papers. We are particularly grateful to Tom Dean, a leading expert in AI planning and control, for agreeing to serve on the Program Committee to facilitate cross-disciplinary dialogues. We also thank graduate student volunteers for their assistance in preparing the workshop. The cover design is taken from the art work by Ying Yin, a Skowhegan Fellow in visual art.

Finally, we acknowledge the financial support from the American Association for Artificial Intelligence for student travel, and other support from the Massachusetts Institute of Technology, the Ohio State University, and Xerox Palo Alto Research Center.

– Kenneth Yip and Feng Zhao
Workshop Cochairs

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