

Ian Miguel Wheeler Ruml (Eds.)

# Abstraction, Reformulation, and Approximation

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Proceedings

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# Preface

It has been recognized since the inception of artificial intelligence that abstractions, problem reformulations and approximations (AR&A) are central to human common-sense reasoning and problem solving and to the ability of systems to reason effectively in complex domains. AR&A techniques have been used in a variety of problem-solving settings, including automated reasoning, cognitive modelling, constraint programming, design, diagnosis, machine learning, model-based reasoning, planning, reasoning, scheduling, search, theorem proving, and intelligent tutoring. The primary use of AR&A techniques in such settings has been to overcome computational intractability by decreasing the combinatorial costs associated with searching large spaces. In addition, AR&A techniques are useful for knowledge acquisition and explanation generation in complex domains.

The considerable interest in AR&A techniques has led to a series of successful symposia over the last decade, the Symposium on Abstraction, Reformulation, and Approximation (SARA). Its aim is to provide a forum for intensive interaction among researchers in all areas of artificial intelligence and computer science interested in the different aspects of AR&A. AAAI workshops in 1990 and 1992 focused on selecting, constructing, and using abstractions and approximations, while a series of workshops in 1988, 1990, and 1992 focused on problem reformulations. The two series were then combined since there was considerable overlap in their attendees and topics. The present symposium is the seventh in this new series, following successful symposia in 1994, 1995, 1998, 2000, 2002, and 2005. The diverse backgrounds of participants of the symposia lead to a rich and lively exchange of ideas, allow the comparison of goals, techniques, and paradigms between researchers who might not otherwise be aware of each others' work, and help identify important research issues and engineering hurdles.

This volume contains the proceedings of SARA 2007, the seventh symposium, held at Whistler Village, British Columbia, Canada, July 18-21. Three distinguished speakers were invited to give keynote presentations, and their abstracts are included herein: Vadim Bulitko of the University of Alberta, Canada; Alan Frisch of the University of York, UK; and John Hooker of Carnegie Mellon University, USA. We thank all the authors of submitted papers for their efforts in preparing an impressive corpus of work, the Programme Committee and auxiliary reviewers for their thorough evaluation and considered selection of presentations for SARA, and the SARA Steering Committee for its advice and guidance. We are also very grateful to Google, the Pacific Institute for the Mathematical Sciences, and the Palo Alto Research Center for their generous support of the symposium, and to the Association for the Advancement of Artificial Intelligence (AAAI), with which SARA 2007 is affiliated.

July 2007

Ian Miguel  
Wheeler Ruml

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