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Abstraction, Reformulation, and Approximation

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Preface

It has been recognized since the inception of Artificial Intelligence (AI) 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 to solve a variety of tasks, including automatic programming, constraint satisfaction, design, diagnosis, machine learning, search, planning, reasoning, game playing, scheduling, and theorem proving. The primary purpose of AR&A techniques in such settings is to overcome computational intractability. In addition, AR&A techniques are useful for accelerating learning and for summarizing sets of solutions.

This volume contains the proceedings of SARA 2002, the fifth Symposium on Abstraction, Reformulation, and Approximation, held at Kananaskis Mountain Lodge, Kananaskis Village, Alberta (Canada), August 2-4, 2002. The SARA series is the continuation of two separate threads of workshops: AAAI workshops in 1990 and 1992, and an ad hoc series beginning with the "Knowledge Compilation" workshop in 1986 and the "Change of Representation and Inductive Bias" workshop in 1988 with followup workshops in 1990 and 1992. The two workshop series merged in 1994 to form the first SARA. Subsequent SARAs were held in 1995, 1998, and 2000.

SARA's aim is to provide a forum for intensive interaction among researchers in all areas of AI with an interest in the different aspects of AR&A techniques. The diverse backgrounds of participants leads to a rich and lively exchange of ideas, and a transfer of techniques and experience between researchers who might otherwise not be aware of each other's work.

SARA has a tradition of inviting distinguished researchers from diverse areas to give technical keynote talks of a survey nature. SARA 2002 has two keynote speakers from established SARA areas: Sridhar Mahadevan will speak about abstraction and reinforcement learning and Derek Long about reformulation in planning. SARA 2002 also has two keynote speakers from areas that have not been strongly represented at previous SARAs: Bob Kurshan will survey the use of abstraction in model-checking and Aristide Mingozzi will survey state space relaxation and search strategies in dynamic programming.

The papers in this volume are representative of the range of AR&A techniques and their applications. We would like to thank the authors and the keynote speakers for their efforts in preparing high quality technical papers and presentations accessible to a general audience, and thank the program committee and anonymous reviewers for the time and effort they invested to provide constructive feedback to the authors. We are very grateful for the assistance we received in organizing SARA 2002 from Susan Jackson, Sunrose Ko, Yngvi Bjornsson, Rob Lake, and Shirley Mitchell. Judith Chomitz and Tania Seib at the Kananaskis Mountain Lodge were a pleasure to work with. We would like to express a special thanks to Berthe Choueiry for her advice, suggestions, and support.

Several organizations provided financial support or assistance which greatly enhanced the richness of the SARA experience, and for which all SARA 2002 participants owe thanks: the American Association for Artificial Intelligence (AAAI), NASA Ames Research Center, the Pacific Institute for the Mathematical Sciences (PIMS), the University of Alberta, and Georgia Institute of Technology. SARA 2002 is a AAAI affiliate.

July 2002

Sven Koenig
Robert C. Holte

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