Symposium on Abstraction, Reformulation and Approximation (SARA-98)

May 9-12, 1998

Asilomar Conference Center
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Introduction

From the inception of Artificial Intelligence (AI) research it has been recognized that abstractions, problem reformulations and approximations are central to human common-sense reasoning and problem solving and to the ability of systems to reason effectively in complex domains. Abstractions, reformulations and approximations (AR&A) have been used in a variety of problem-solving settings including automatic programming, constraint satisfaction, design, diagnosis, machine learning, planning, qualitative reasoning, scheduling and theorem proving. The primary use of AR&A 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 also useful for knowledge acquisition and explanation generation in complex domains.

The considerable interest in AR&A has led to a series of successful workshops over the last few years. AAAI workshops in 1990 and 1992 focused on selecting, constructing and using abstractions and approximations, while a series of workshops in 1989, 1990 and 1992 focused on problem reformulations. There was considerable intersection in the set of attendees and topics of the two separate workshop series, and this lead to holding merged workshops in 1994 and 1995. The present symposium is the third in this new series. The aim of this symposium 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. We hope and expect that the diverse backgrounds of participants will lead to a rich and lively exchange of ideas, allowing comparison of goals, techniques and paradigms, and enabling identification of important research issues and engineering hurdles.

Additional information about SARA-98 may be obtained from the symposium home page on the World Wide Web: `http://www.cs.rutgers.edu/~ellman/sara98/sara98.html`.

Participants

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Agenda

Sunday, May 10th

08:30-09:00 Coffee and SARA-98 Registration.

09:00-09:15 Welcome to SARA-98, Tom Ellman.

09:15-10:15 Exploiting Structure in Solving Planning Problems or Coping with the Blooming and Buzzing World that Surrounds Us, Tom Dean, Invited Speaker.

10:15-10:45 Coffee Break.

10:45-11:15 Abstraction for Real-Time Intelligent Control, Robert Goldman, David Musliner, Mark Boddy and Kurt Krebsbach.

11:15-11:45 A Unifying Framework for Temporal Abstraction in Stochastic Processes, Ronald Parr.

11:45-12:00 Discussion. (Tom Ellman)

12:00-01:30 Lunch.

01:30-02:00 Reformulation in Databases: Answering Queries Using Views, Alon Levy.

02:00-02:30 Database Reformulation, Rada Chirkova and Michael Genesereth.

02:30-03:00 Towards a Formalization of Elaboration Tolerance: Adding and Deleting Axioms, Eyal Amir.

03:00-03:15 Discussion. (Mike Genesereth)

03:15-03:45 Coffee Break.

03:45-04:15 Efficient Retrieval of Abstract Cases for Case-Based Planning, Ralph Bergmann.

04:15-04:45 Semantic Abstraction for Concept Representation and Learning, Lorenza Saitta and Jean-Daniel Zucker.

04:45-05:00 Discussion. (Rob Holte)

05:00-05:30 Panel Discussion: Idealization of Deterministic and Stochastic Systems: Similarities and Differences. (Tom Dean, Fausto Giunchiglia, Mike Lowry)

Agenda (Continued)

Monday, May 11th

09:00-09:30 Abstraction in Planning via Model Checking, A. Cimatti, F. Giunchiglia and M. Roveri.

09:30-10:00 Abstraction for Analytic Verification of Concurrent Software Systems, Mike Lowry and Mahadevan Subramaniam.

10:00-10:30 Coffee Break.

10:30-11:00 Structuring Deduction using Abstractions, Dieter Hutter.

11:00-11:30 On Reformulation of Constraint Satisfaction Problems, Rainer Weigel, Chiristian Bliek and Boi V. Faltings

11:30-12:00 Discussion. (Toby Walsh)

12:00-01:30 Lunch.

01:30-02:00 Thoughts on a Practical Theory of Reformulation for Reasoning about Physical Systems, Berthe Chouiery, Sheila McIlraith, Yumi Iwasaaki, Tony Loeser, Todd Neller, Robert Englemore and Richard Fikes.

02:00-02:30 Generating a Compact Representation of an Exponentially Large Solution Space, Daniel Clancy.

02:30-02:45 Discussion. (Lou Steinberg)

02:45-03:15 Coffee Break.

03:15-03:45 Flexible and Approximate Computation through State Space Reduction, Weixiong Zhang.

03:45-04:15 Representation Changes for Planning with Exponential Utility Functions, Sven Koenig.

04:15-04:45 Highest Utility First Search Across Multiple Levels of Stochastic Design, Louis Steinberg, J. Storrs Hall and Brian Davison.

04:45-05:00 Discussion. (Berthe Chouiery)

Tuesday, May 12th

Informal Discussion: Building the SARA Community and Organizing the Next SARA.

Papers

Papers (Continued)

Research Summaries