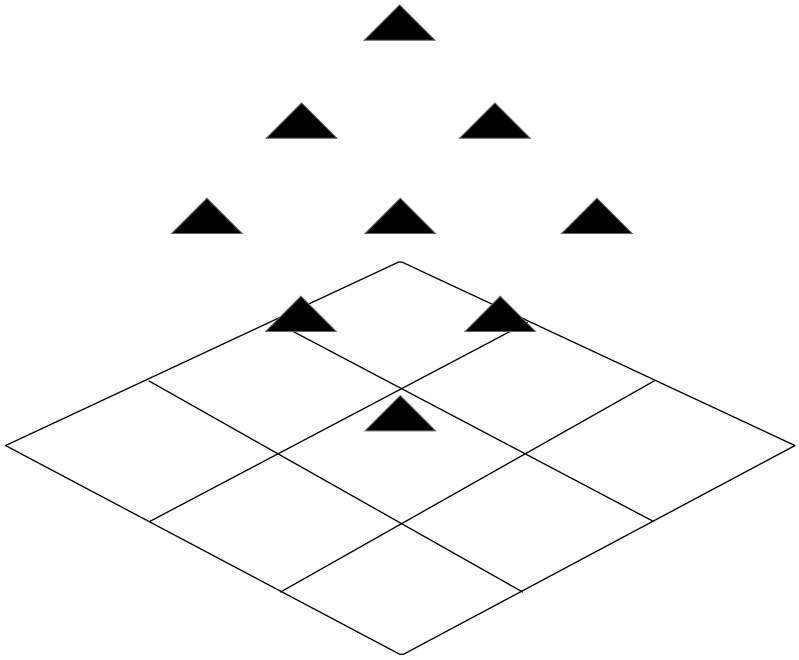


AAAI 2001

Spring Symposium Series

March 26 – 28, 2001

Stanford University, California

Call for Participation

Sponsored by the

American Association for Artificial Intelligence
445 Burgess Drive, Menlo Park, CA 94025
(650) 328-3123
sss@aaai.org
www.aaai.org/Symposia/symposia.html

The American Association for Artificial Intelligence, in cooperation with Stanford University's Computer Science Department, is pleased to present its 2001 Spring Symposium Series, to be held Monday through Wednesday, March 26–28, 2001 at Stanford University in Stanford, California. The topics of the seven symposia in this symposium series are:

- Answer Set Programming: Towards Efficient and Scalable Knowledge Representation and Reasoning
- Artificial Intelligence and Interactive Entertainment
- Game Theoretic and Decision Theoretic Agents
- Learning Grounded Representations
- Model-Based Validation of Intelligence
- Robotics and Education
- Robust Autonomy

An informal reception will be held on Monday, March 26. A general plenary session, in which the highlights of each symposium will be presented, will be held on Tuesday, March 27.

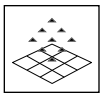
Symposia will be limited to between forty and sixty participants. Each participant will be expected to attend a single symposium. Working notes will be prepared and distributed to participants in each symposium. In addition to invited participants, a limited number of interested parties will be able to register in each symposium on a first-come, first-served basis. Registration information will be available in December. To obtain registration information, write to:

- AAAI Spring Symposium Series
  445 Burgess Drive
  Menlo Park, CA 94025-3442
  Voice: 650-328-3123
  Fax: 650-321-4457
  sss@aaai.org
  www.aaai.org/Symposia/symposia.html

Submission Dates

- Submissions for the symposia are due on October 9, 2000.
- Notification of acceptance will be given by November 8, 2000.
- Material to be included in the working notes of the symposium must be received by January 17, 2001.

Please see the individual symposium descriptions for specific submission requirements.



Answer Set Programming

Towards Efficient and Scalable Knowledge Representation and Reasoning

Answer set programming (ASP) (also known as stable logic programming and A-Prolog) is the realization of much theoretical work in nonmonotonic reasoning and AI applications of logic programming in the last 12 years. It is based on the view of program statements as constraints on the solution of a given problem. Subsequently, each model of the program encodes a solution to the problem itself. For instance, an ASP program encoding a planning scenario has as many models as valid plans. This schema is similar to that underlying the application of SAT algorithms to AI, and in fact the range of applicability of these two techniques is similar. However, thanks to the inherent causal aspect of Answer Set semantics, we can represent default assumptions, constraints, uncertainty and nondeterminism in a direct way.
Several ASP systems are now available. Among them are smodels, dlv, DeReS and XSB. These systems support provably correct inferences and are at least as fast and scalable as SAT checkers. These are exciting results for the NMR community and they are attracting the attention of researchers from fields such as planning, cryptography and system verification.

Submissions

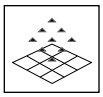
We invite submissions of research abstracts, position papers, system demonstrations and experience reports on all aspects of ASP. Here is an incomplete list of "global" questions that authors might want to address:

- What are the strengths of ASP, vis-a-vis with satisfiability, CSP, abduction, argument-based reasoning and model checking
- What applications are going to give a perceivable edge (diagnosis, active databases)
- What is a fair benchmark to evaluate progress in implementation, preferably beyond random-generated instances.

Some of the specific topics that we would like to discuss at the workshop (through either panel discussions or individual presentations), and more details are listed on the symposium web page: www2.cs.utep.edu/~provetti/asp2000.html

Organizing Committee

A. Provetti (cochair), University of Texas at El Paso (provetti@cs.utep.edu); S. Tran Cao (cochair), Knowledge Systems Lab, Stanford University (tson@ksl.stanford.edu); C. Baral, Arizona State University; S. Costantini, Università di L'Aquila; M. Gelfond, Texas Tech University; A. Kakas, University of Cyprus; N. Leone, TU Wien; V. Lifschitz, University of Texas at Austin; S. McIlrath, Knowledge Systems Lab, Stanford University; I. Niemela, Helsinki University of Technology; M. Pagnucco, Macquarie University; E. Pontelli, New Mexico State University; H. Turner, University of Minnesota-Duluth; M. Truszczynski, University of Kentucky; J-H. You, University of Alberta



Artificial Intelligence and Interactive Entertainment

Interactive, computer-based forms of entertainment, such as computer games, interactive fiction, and software toys, represent a large, techonologically-savvy industry that is actively seeking powerful artificial intelligence techniques. Until recently there was little communication between the interactive entertainment industry and the AI research community. As a result, the interactive entertainment industry may be overlooking useful AI techniques developed by the research community and the research community may be overlooking interesting problems and constraints faced by the interactive entertainment industry.

This symposium seeks to continue the interaction between these two communities that has recently begun. Submissions are encouraged from both the AI research community and the interactive entertainment industry. Questions for this symposium include:

- What AI techniques might be useful in computer games, interactive fiction or software toys?
- What current AI research projects are using commercial interactive entertainment products?
- What important problems and constraints are being ignored by the research community?
- What is the state of the art in interactive entertainment AI right now?
- How can the freedom of autonomous agents be integrated with the constraints of a plot or story line?
- How will new AI technologies improve/change interactive entertainment?
- How can we strengthen the burgeoning relationship between the research and industry communities?

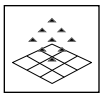
Submissions

Potential participants should submit a short paper (3-5 pages) describing work recently completed or in progress that they would like to discuss. Submissions may also take the form of discussion questions (1-2 pages) on which a panel discussion could be based or a short (1-2 page) description of how the AI is implemented in a commercial interactive entertainment product. For all submissions, participants should include a CV or resume highlighting their work in this area.

Send submissions to Michael van Lent, vanlent@umich.edu. We require that all submissions come by email. ASCII is preferred and Acrobat or HTML will be accepted.

Organizing Committee

John Laird (cochair), University of Michigan; Michael van Lent (cochair), University of Michigan; Ernest Adams, Bullfrog Productions; Ian Davis, Mad Doc Software; Wolff Dobson, Visual Concepts Entertainment; Ken Forbus, Northwestern University; Lars Linden, Valve Software; Andrew Stern, InteractiveStory.net



Game Theoretic and Decision Theoretic Agents

Over the last few years, game and decision theories have proved to be powerful tools with which to design autonomous agents, and to understand interactions in systems composed of many such agents. Decision theory has been adopted as a paradigm for designing agents that can handle the uncertainty of any moderately complex environment, and act rationally to achieve their goals. Game theory, largely assuming the existence of self-interested agents, has been employed in the design of mechanisms and protocols for interaction, coordination, communication, negotiation, coalition formation, fair voting techniques, market-based resource management systems, and industrial-scale information economies.

As a result, there seems to be much to gain from bringing together researchers interested in game theory and decision theory to present recent work on the application of these techniques in the construction of agent systems, and to discuss the cross-over between the fields.

We solicit papers dealing with, but not limited to, the following areas:

- Descriptions of agent systems employing game theory or decision theory
- Empirical evaluations of agent systems employing game theory or decision theory
- Theoretical developments in game theory or decision theory applied to agent systems;
- Position statements about the use of game theory or decision theory in agent systems.

Descriptions of deployed systems are welcome. We are also interested in the use of non-standard variants of decision theory (including qualitative and logical approaches), and in approaches that combine decision and game theories.

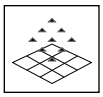
Cochairs

Simon Parsons, Department of Computer Science, Chadwick Building, University of Liverpool, Liverpool L69 7ZF, United Kingdom. Email: S.D.Parsons@elec.qmw.ac.uk

Piotr Gmytrasiewicz, CSE Department, University of Texas at Arlington, Arlington, TX 76019-0015. Email: piotr@huckle.uta.edu

Organizing Committee

Cristina Biccheri, Carnegie Mellon University (cb36@andrew.cmu.edu); Jon Doyle, Massachusetts Institute of Technology (doyle@mit.edu); Amy Greenwald, IBM Institute for Advanced Research (amygreen@cs.brown.edu); Jeff Kephart, IBM Institute for Advanced Research (kephart@watson.ibm.com); Sarit Kraus, Bar-Ilan University (sarit@macs.biu.ac.il); Wynn Stirling, Brigham Young University (wynn@ee.byu.edu); Gerald Tesauro IBM Watson Research Center (tesauro@watson.ibm.com); Leon van der Torre, Free University of Amsterdam (torre@cs.vu.nl); Russell Vane, Litton PRC (Vane_Russ@prc.com); Michael Wooldridge, University of Liverpool (M.J.Wooldridge@csc.liv.ac.uk)



Learning Grounded Representations

If one takes the view that situated agents require representations, then one is led to ask how representations are learned and how do they acquire meanings. These questions are equally interesting to AI researchers, psychologists, philosophers, linguists, and other cognitive scientists; and, of course, they admit many kinds of answers. We do not wish to limit debate or take a doctrinaire position, except to say that this symposium is about learning representations whose meanings are somehow related to the world in which they are grounded.

We welcome submissions on the following and related topics:

- Learning algorithms for robots and simulated agents, and learning in infants, to get from sensory data to representations.
- Identifying relevant sensory information, both across sensors and time.
- Appropriate learning biases, or prior structure, both domain specific and domain general.
- Representations that capture the dynamics of interactions with the environment.
- The acquisition and grounding of ontological distinctions.
- Learning word meanings, and language learning more generally.

The symposium will consist of technical presentations, an invited speaker, a panel discussion, and a general discussion at the end of the day to identify broad themes and promising directions. Attendance will be limited to 50 participants.

Submissions

Persons interested in participating should submit a short paper (no more than six pages) or a position statement (no more than two pages). Submit electronically (preferred) to oates@cs.umass.edu, or mail three hard copies to either of the cochairs. PostScript and Word are acceptable formats for electronic submissions.

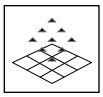
Cochairs

Paul R. Cohen, Computer Science Department, LGRC, University of Massachusetts, Box 34610, Amherst, MA 01003-4610, Email: cohen@cs.umass.edu, Voice: 413-545-3613, Fax: 413-545-1249

Tim Oates, Computer Science Department, LGRC, University of Massachusetts, Box 34610, Amherst, MA 01003-4610, Email: oates@cs.umass.edu, Voice: 413-545-3613, Fax: 413-545-1249

Organizing Committee

Carole Beal, University of Massachusetts at Amherst (cbeal@psych.umass.edu); Benjamin Kuipers, University of Texas at Austin (kuipers@cs.utexas.edu); Luc Steels, Vrije Universiteit Brussel (steels@arti.vub.ac.be)



Model-Based Validation of Intelligence

Artificial intelligence is finding many promising applications in safety-critical areas such as avionics, factory control, or space exploration. To live up to these promises, intelligent software has to provide evidence that it meets the stringent quality control requirements imposed by such applications. However, we are still far from producing fully validated intelligent systems. In fact, it is not even clear that we know how to specify validation criteria. For example, emergent behaviors, a true hallmark of intelligence, are something that most "mission critical" users (such as autonomous systems, on-line trading systems, and life support systems) would most probably be scared of, especially if the behavior is not predictable. It remains to be seen how to specify the validity of a "predictable" emergent behavior. Traditional testing techniques usually fall short in validating complex intelligent systems. This is due to the huge number of possible configurations that need to be covered. Therefore, the need for analysis tools that guarantee coverage and robustness is apparent. Model checking is advertised as an efficient way to exhaustively search all behaviors of a program. It has been successfully put into practice for more traditional software. Another approach, model-based systems, has recently had great success in mission critical applications and also provides a formal basis to specify intelligent behavior. An important question arises: what is the relationship between model checkers and model-based reasoning systems? What is the relationship between their representation structures? What are the relationships between their reasoning mechanisms? Is it possible they are using different terminologies for similar concepts?

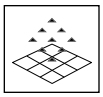
In this symposium we will bring together researchers in software verification and intelligent systems to compare techniques, explore possible cross-fertilization, and look for answers to the fundamental questions on "validated intelligence". In particular, we are interested in the potential synergies between model checking and model-based reasoning. We envision the presentations to include, but not be limited to incorporation of verification techniques in AI systems, incorporation of AI techniques in verification systems, verification of domain models and reasoning engine code, validation criteria and coverage measurements, formal semantics for AI-based systems, or verification of integrated multi-layer systems and adaptive systems.

Submissions

Potential participants should submit a concise 1-3 page abstract describing work recently completed or in progress (longer papers may be accepted for distribution). Alternatively, a list of questions may be submitted to help seed panel discussions on interesting related issues.Electronic submissions are preferred, in plain ASCII, PDF, or PostScript. Please e-mail submissions to Lina Khatib (lina@ptolemy.arc.nasa.gov). Web page: http://ase.arc.nasa.gov/mvi

Organizing Committee

Lina Khatib and Charles Pecheur (cochairs), NASA Ames Research Center; Edmund M. Clarke, Carnegie Mellon University; Robert P. Goldman, Honeywell Technology Center; Klaus Havelund, NASA Ames Research Center; Nicola Muscettola, NASA Ames Research Center; Paul Pettersson, Uppsala University, Sweden; Paolo Traverso, IRST, Trento, Italy.



Robotics and Education

Robots have proved a wonderful motivator in a variety of learning environments. In this symposium, we will collect and share experiences in successful deployment of robots in classrooms and other educational venues with an eye to developing a shared resource for future users of robotic technologies.

We hope to include a diverse group of projects ranging from those that use robots to teach more traditional aspects of mechanical engineering or artificial intelligence to those that use robotics in novel or nontraditional ways; from structured classroom activities to free-ranging projects; from those who address the pedagogical value of robots as learning tools to those who study their social implications; and from fields ranging from traditional educators to research scientists.

Submissions are particularly encouraged from those who have significant experience deploying robots in educational venues and/or those who would be able to bring demonstration projects to the symposium.

Submissions

To participate, send an abbreviated CV (no more than 2 pages) and/or description of your work (no more than 4 pages/2000 words). Please indicate the kind(s) of robot(s) you have used, the ages with which you have worked, the nature of the educational venues, the topics or subjects the robots were used to teach, and the duration and scope of the project. Include information about demonstrations you might bring to the symposium.

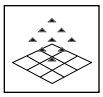
Accepted participants will be asked to contribute a longer description and other resource materials for distribution to participants.

Electronic submissions (in PDF, PostZcript, or plain ASCII text) are especially encouraged. Please send submissions to rne-sss@ai.mit.edu. If you cannot submit electronically, 6 paper copies may be mailed to:

Professor Lynn Andrea Stein
Franklin W. Olin College of Engineering
1735 Great Plain Avenue
Needham, MA 02492-1245
617 253 2663

Organizing Committee

Martha Cyr, Tufts; Fred Martin, MIT; Cathryne Stein, KISS Institute for Practical Robotics; Lynn Andrea Stein (chair), Olin College



Robust Autonomy

AI researchers have made exciting progress in designing architectures that perform basic functions required for intelligent autonomous operations. With the potential for lowering operations costs and enabling new capabilities, there is a growing interest in integrating these architectures into our everyday lives. However, when these architectures are deployed, operators often discover that the resulting systems don't quite work as planned when challenging situations are encountered. In fact, a general perception is that increased autonomy equates to increased risk.

As automation extends into ambitious domains such as spacecraft and reactor process control, the cost of "not working quite as planned" is enormous. In these domains, it is important that any controller be reliable and robust to the spectrum of possible situations, even those involving systems failure or unexpected events. This symposium will explore the issues and approaches involved in applying AI techniques to domains in which robust and reliable operation is critical.

Topics of interest include:

- Challenges and potential approaches for achieving robust autonomy.
- Methods for assessing system robustness as a function of autonomy level.
- Agent architectures designed to facilitate robust operation.
- Algorithms for fault detection, isolation, and recovery.
- Reasoning about imprecise knowledge or poorly-modeled environments to minimize the occurrence and impact of unexpected situations.
- The role of learning and adaptation in increasing autonomy and robustness.
- Verification/validation of agents for safety-critical or mission-critical operation.
- Domains that require robust autonomy and specific autonomy behaviors to be achieved.
- Deployed system design, actual performance observed, and lessons learned.

The symposium will be scheduled to provide extensive discussion time and group interactions. The symposium will consist of invited talks, medium-length paper presentations, and topic-oriented group discussions.

Submissions

Those interested in participating should send either a 1-3 page extended abstract or 6-8 page paper describing their related work and areas of interest. Submissions may discuss work in any stage of development, from concepts and future directions to finished work. Particular attention should be paid to clarifying aspects of the research associated with robust and reliable operation. Electronic submissions of PostScript, PDF, or Word in AAAI format are preferred, and should be sent to Ella Atkins at atkins@eng.umd.edu by the submission deadline.

Organizing Committee

Ella Atkins (cochair), University of Maryland; Lorraine Fesq (cochair), MIT; Reid Simmons, Carnegie Mellon University; Shlomo Zilberstein, University of Massachusetts; Tom Wagner, University of Maine; Sanguk Noh, Oregon Graduate Institute