AAAI 2001

Spring Symposium Series

March 26-28, 2001
Stanford University, California

Registration

The American Association for Artificial Intelligence, in cooperation with Stanford University's Department of Computer Science, presents the 2001 Spring Symposium Series, to be held Monday through Wednesday, March 26-28, 2001, at Stanford University. The topics of the seven symposia 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

The highlights of each symposium will be presented at a special plenary session. Working notes will be prepared and distributed to participants in each symposium, but will not otherwise be available unless published as an AAAI Technical Report or edited collection.

Each symposium will have limited attendance. Participants will be expected to attend a single symposium throughout the symposium series. In addition to participants selected by the program committee of the symposia, a limited number of other interested parties will be allowed to register in each symposium on a first-come, first-served basis. To register, please fill out the registration form, and send it along with payment to:

2001 Spring Symposium Series
AAAI, 445 Burgess Drive
Menlo Park, CA 94025
Telephone: 650-328-3123*
Fax: 650-321-4457*
E-mail: sss@aaai.org*

*Credit card orders only, please. Please note that there are security issues involved with the transmittal of credit card information over the internet. AAAI will not be held liable for any misuse of your credit card information during its transmittal to AAAI.

This document is also available at http://www.aaai.org/Symposia/Spring/2001/sssregistration-2001.pdf.

Tentative Program Schedule

(subject to change)

Monday, March 26

9:00 AM - 5:30 PM:	Symposia sessions
6:00 PM - 7:00 PM:	Reception

Tuesday, March 27

9:00 AM - 5:30 PM:	Symposia sessions
6:00 PM - 7:00 PM:	Plenary session

Wednesday, March 28

9:00 AM - 12:30 PM:	Symposia sessions

Registration will be held on the Stanford University Campus in a location that will be announced on the AAAI website in February.

Answer Set Programming:

Towards Efficient and Scalable
Knowledge Representation and Reasoning

Answer set programming (ASP) is the realization of much theoretical work in nonmonotonic reasoning, AI, and logic programming over 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 ranges of applicability of these two techniques are 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, (such as DeReS, dlv, smodels and XSB); they support provably correct inferences and are at least as fast and scalable as SAT checkers. These exciting results for the NMR community are attracting the attention of researchers in fields such as planning, cryptography and system verification.

Participants will present their work on ASP and will address questions such as: "What are the strengths of ASP vis-a-vis satisfiability, CSP, abduction, argument-based reasoning and model checking?" "What applications are going to give a perceivable edge (diagnosis, workflow, configuration …)?" "What is a fair benchmark to evaluate progress in implementations?"

Some topics that we expect to discuss include: (1) new answer set computation algorithms, performance, correctness etc. (2) relationship with other semantics (well-founded semantics, preference logic, equilibrium logic); (3) software engineering of ASP (4) application experiences in, and issues arising from planning and robot control; diagnosis; configuration; model checking; and constraint programming.

There will be 33 presentations including lectures and posters. Four half-hour seminars will address the expressivity of ASP, representation of non-Boolean fluents, diagnosis and product configuration, respectively. Other presentations will be organized in thematic sessions led by a PC member. The invited speakers, who are from outside ASP, will describe developments in neighboring areas. A panel session will discuss new systems and application demonstrations, and a working group will announce a benchmark for evaluating ASP systems performance.

Organizing Committee

A. Provetti (Cochair), U. of Texas at El Paso (provetti@cs.utep.edu); S. Tran Cao (Cochair), Stanford (tson@ksl. stanford. edu); C. Baral, Arizona State U.; S. Costantini, U. di L'Aquila; M. Gelfond, Texas Tech U.; A. Kakas, U. of Cyprus; N. Leone, TU Wien; V. Lifschitz, U. of Texas at Austin; S. McIlrath, Stanford U.; I. Niemela, Helsinki U. of Tech.; M. Pagnucco, Macquarie U.; E. Pontelli, New Mexico State U.; H. Turner, U. of Minnesota-Duluth; M. Truszczynski, U. of Kentucky; J-H. You, U. 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, technologically-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. Representatives from both the AI research community and the interactive entertainment industry are encouraged to attend the symposium. 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?

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, building on the assumption that agents are rational and self-interested, 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. Further, interesting recent results have been reported on the issue of mechanism and protocol design for bounded rational agents.

This symposium will bring together researchers interested in game theory and decision theory to present recent work on the applications of these techniques in the construction of agents and agent systems, and to discuss the cross-over between these fields.

Invited Speakers

Hal Varian (University of California, Berkeley) and Kenneth Arrow (Stanford).

Cochairs

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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 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. Among the topics that will be discussed are the following:

- 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 to identify broad themes and promising directions.

Organizing Committee

Paul R. Cohen (cohen@cs.umass.edu) and Tim Oates (oates@cs.umass.edu), University of Massachusetts (Cochairs), 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

The aim of this interdisciplinary symposium is to bring together researchers in software verification, formal methods, and intelligent systems to compare techniques, explore possible opportunities for cross-fertilization, and look for answers to the fundamental question of the nature of "validated intelligence." In particular, we are interested in the potential synergies between model checking and model-based reasoning.

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. 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?

The symposium consists of technical presentations, panel discussions, and invited talks. Audience participation, through questions and comments, is encouraged.

We envision the presentations to include,

- 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.
- Verification of integrated multilayer systems and adaptive systems.

Details and a schedule can be found at http://ase.arc.nasa.gov/mvi

Invited Speakers

Kim Larsen, Aalborg University, Denmark; Nicola Muscettola, NASA Ames Research Center; and Paolo Traverso, IRST, Trento, Italy.

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.

The symposium will address a diverse group of projects ranging from the use of 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.

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. Of particular interest are the lessons learned from deployed autonomous systems.

Topics to be presented 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.

Richard J. Doyle, Leader, JPL's Center for Space Mission Information and Software Systems, will deliver an invited talk, entitled "Inspiration and Challenges for Future Autonomous Space Systems."

The symposium will be scheduled to provide extensive discussion time and group interactions. The symposium will consist of medium-length paper presentations, topic-oriented group discussions, and the invited talk. For more details, contact Ella Atkins (atkins@eng.umd.edu) or Lorraine Fesq (fesq@mit.edu).

Organizing Committee

Ella Atkins (Cochair), U. Maryland; Lorraine Fesq (Cochair), MIT; Reid Simmons, Carnegie Mellon; Shlomo Zilberstein, U. Mass.; Tom Wagner, U. Maine; Sanguk Noh, U. Missouri-Rolla.

Registration and General Information

ALL ATTENDEES MUST PREREGISTER. Each symposium has a limited attendance, with priority given to invited attendees. All accepted authors, symposium participants, and other invited attendees must register by February 9, 2001. After that period, registration will be opened up to the general membership of AAAI and other interested parties. All registrations must be postmarked by February 26, 2001.

Your registration fee covers your attendance at the symposium, a copy of the working notes for your symposium, and the reception.

Checks (drawn on a US bank) or international money orders should be made out to AAAI. VISA, MasterCard and American Express are also accepted. Please fill out the attached registration form and mail it with your fee to:

AAAI
SSS-01
445 Burgess Drive
Menlo Park, CA 94025

If you are paying by credit card, you may e-mail the form to sss@aaai.org or fax it to 650-321-4457. Registration forms are also available on AAAI's web page: www.aaai.org/Symposia/Spring/sssregform.html or sssregform.pdf.

Please note: **All refund requests must be in writing and postmarked by March 5, 2001.** No refunds will be granted after this date. A $25.00 processing fee will be levied on all refunds granted.

When you arrive at Stanford, please pick up your complete registration packet from the Spring Symposium Series 2001 registration desk, the location of which will be noted on your registration receipt.

Registration hours will be:

Monday, March 26
8:00 AM - 5:00 PM

Tuesday, March 27
8:30 AM - 5:00 PM

Wednesday, March 28
8:30 AM - 12:00 PM

Please call AAAI at 650-328-3123 for further information.

Parking

Special symposium parking will be available on the Stanford Campus, March 26-28, at a cost of $8.50 for all three days. Please indicate on the symposium registration form if you would like a parking permit. The permits will be mailed to you with your registration receipt, along with a map and directions to the assigned parking areas. Please note that parking permits are valid only in designated areas. You will need to take the campus shuttle (Marguerite) to the Spring Symposium registration area and sessions. Please allow an extra thirty minutes travel time in your schedule for the shuttle.

Accommodations

For your convenience, AAAI has reserved a block of rooms at the hotels listed below. Symposium attendees must contact the hotels directly. Please identify yourself as an AAAI Spring Symposium Series attendee to qualify for the reduced rates.

Best Western Riviera
15 El Camino Real
Menlo Park, CA 94025
Phone: 650-321-8772
Fax: 650-321-2137
Marguerite shuttle nearby
Rates: $149 (S) or (D)
Reserve before February 25, 2001

Creekside Inn
3400 El Camino Real
Palo Alto, CA 94306
Phone: 650-493-2411 or 800-492-7335
Fax: 650-852-9500
Marguerite shuttle pick-up: 0.5 mile
Rates: $149 (S), $169 (D)
Reserve before February 25, 2001

Sheraton Palo Alto
625 El Camino Real
Palo Alto, CA 94301
Phone: 650-328-2800 or 800-874-3516
Fax: 650-327-7362
Marguerite shuttle stop nearby
Rate: $179 (S) or (D)
Reserve before March 5, 2001

Stanford Terrace Inn
531 Stanford Ave
Palo Alto, CA 94306
Phone: 650-857-0333 or 800-729-0332
Fax: 650-857-0343
Stanford Terrace Shuttle available with advance notice.
Marguerite shuttle stop nearby
Rates: $145 (S), $150 (D)
Reserve before February 25, 2001

Other Hotels

(Available only on a first-come, first served basis; all prices are subject to change without notice).

The Cardinal Hotel
235 Hamilton Avenue
Palo Alto, CA 94301
Phone: 650-323-5101
Fax: 650-325-6086
Marguerite shuttle stop nearby
Rates: $135 (S) or (D)

Hotel California
2431 Ash Street
Palo Alto, CA 94306
Phone: 650-322-7666
Fax: 650-321-7358
Marguerite shuttle stop nearby
Rates: $80-$95 (S) or (D)

Mermaid Inn
727 El Camino Real
Menlo Park, CA 94025
Phone: 650-323-9481
Fax: 650-323-0662
Rates: $74–$76 (S) or (D)

Air Transportation & Car Rental

AAAI has selected Stellar Access, Inc. (SAI) as the official travel agency for this meeting. Call 800-929-4242 and ask for Group #428, or visit www.stellaraccess.com, register if you are a first-time user, and refer to Group 428. If you book on-line, you will pay no transaction fee. You will receive the following discounts or the lowest available fares on any other carrier: United Airlines—save 5% to 10% on lowest applicable fares with an additional 5% off with a 60 day advance purchase. Southwest Airlines—save 10% on everyday lowest applicable fares. All rules and restrictions apply. Offer good for travel March 23-31, 2001. Hertz Rent A Car rates start as low as $35/day for economy models and $154/week with unlimited free mileage.

Reservation hours: M-F 6:30am-5:00pm Pacific Time. Call SAI at 800-929-4242. Outside US & Canada: 619-232-4298 / fax 619-232-6497. A $10 transaction fee will be applied to all tickets purchased via

phone service. If you call direct or use your own agency, refer to these codes: *Southwest Airlines* (800-433-5368—File #A8522). *United Airlines* (800-521-4041—ID #549SM). *Hertz* (800-654-2240—CV #02EZ0004)

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In offering Southwest Airlines, United Airlines, Hertz Rent A Car, Best Western Riviera, Creekside Inn, The Sheraton Palo Alto, and Stanford Terrace Inn (hereinafter referred to as "Suppliers") and all other service providers for the AAAI Spring Symposium Series, the American Association for Artificial Intelligence acts only in the capacity of agent for the Suppliers which are the providers of hotel rooms and transportation. Because the American Association for Artificial Intelligence has no control over the personnel, equipment or operations of providers of accommodations or other services included as part of the Symposium program, AAAI assumes no responsibility for and will not be liable for any personal delay, inconveniences or other damage suffered by symposium participants which may arise by reason of (1) any wrongful or negligent acts or omissions on the part of any Supplier or its employees, (2) any defect in or failure of any vehicle, equipment or instrumentality owned, operated or otherwise used by any Supplier, or (3) any wrongful or negligent acts or omissions on the part of any other party not under the control, direct or otherwise, of AAAI.

Ground Transportation

This information is the best available at time of printing. Fares and routes change frequently. Please check by telephoning the appropriate numbers below for the most up-to-date information.

South Bay Shuttle

Van service from San Francisco Airport to Palo Alto is $22 for one person one way. The fare from San Jose Airport to Palo Alto is $33 per person. Cash or checks only. For reservations call 408-559-9477 or 800-548-4664.

Supershuttle

24-hour van service to and from San Francisco to Palo Alto. The fare from San Francisco Airport to Palo Alto is $26 per person one way. Cash or major credit cards only. For reservations call 415-558-8500 or 800-258-3826 (outside California). Reservations can also be made over the web at www.supershuttle.com

Airport Connection

Van service is $58 for one person one way from San Francisco Airport to Palo Alto. The fare from San Jose Airport to Palo Alto is $78. Cash, major credit cards, or checks accepted. Call 888-990-5466 for reservations. White courtesy telephone available at San Francisco Airport.

Stanford Shuttle

The Stanford University Marguerite Shuttle Bus service provides service from several points along El Camino Real, the train station, and other surrounding locations to the Stanford Oval as well as transportation around the Stanford Campus.

Train

CalTrain runs between San Francisco and Palo Alto station starting at 5:15 AM with the last train leaving San Francisco at 10:00 PM (weekdays), 12:00 midnight (Friday and Saturday nights). The fare is $8.00 round trip for same-day travel, or $4.00 one way. For up-to-date fares and timetables, call 800-660-4287.

Registration Form—2001 AAAI Spring Symposium Series

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Please complete in full and return to AAAI, postmarked by February 9, 2001 (invited attendees), or by February 26, 2001 (general registration).
Please print or type—incomplete or illegible forms cannot be processed.

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Symposium

(Please check only one)
☐ 1. Answer Set Programming
☐ 2. Artificial Intelligence and Interactive Entertainment
☐ 3. Game Theoretic and Decision Theoretic Agents
☐ 4. Learning Grounded Representations
☐ 5. Model-Based Validation of Intelligence
☐ 6. Robotics and Education
☐ 7. Robust Autonomy

Fee

☐ Member: $ 220.00   ☐ Nonmember: $ 295.00
☐ Student Member: $ 100.00   ☐ Student nonmember: $ 145.00
  (students must send legible proof of full-time student status)
☐ Temporary Stanford University parking permit, March 26–28 ($8.50)

TOTAL FEE *(Please enter correct amount)* $_____

Method of Payment *(please circle one)*
(All e-mail and fax registrations must be accompanied by credit card information.
Prepayment is required. No PO's will be accepted.)

Check   MasterCard   VISA   American Express

Credit card account number _____

Expiration date _____

Name (as it appears on card) _____

Signature _____

Please mail or fax completed form with your payment to
AAAI, SSS–2001 • 445 Burgess Drive • Menlo Park, California 94025 • 650-321-4457

Please Note: Requests for refunds must be received *in writing* by
March 5, 2001 No refunds will be granted after this date.
A $25.00 processing fee will be levied on all refunds granted.
Thank you for your registration!