



AAAI 2002

Spring Symposium Series

March 25 – 27, 2002

Stanford University, California

Call for Participation

Sponsored by the

American Association for Artificial Intelligence

445 Burgess Drive, Menlo Park, CA 94025

(650) 328-3123

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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 2002 Spring Symposium Series, to be held Monday through Wednesday, March 25–27, 2002 at Stanford University in Stanford, California. The topics of the nine symposia in this symposium series are:

- Acquiring (and Using) Linguistic (and World) Knowledge for Information Access
- Artificial Intelligence and Interactive Entertainment
- Collaborative Learning Agents
- Information Refinement and Revision for Decision Making: Modeling for Diagnostics, Prognostics, and Prediction
- Intelligent Distributed and Embedded Systems
- Logic-Based Program Synthesis: State of the Art and Future Trends
- Mining Answers from Texts and Knowledge Bases
- Safe Learning Agents
- Sketch Understanding

An informal reception will be held on Monday, March 25. A general plenary session, in which the highlights of each symposium will be presented, will be held on Tuesday, March 26.

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
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Menlo Park, CA 94025-3442 USA
Voice: 650-328-3123
Fax: 650-321-4457
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www.aaai.org/Symposia/symposia.html

Submission Dates

- Submissions for the symposia are due on October 5, 2001.
- Notification of acceptance will be given by November 9, 2001.
- Material to be included in the working notes of the symposium must be received by January 21, 2001.

Please see the individual symposium descriptions for specific submission requirements.



Acquiring (and Using) Linguistic (and World) Knowledge for Information Access

This symposium aims to bring together researchers that work with any kind of text analysis with the goal of understanding text, and with information access applications in mind—in particular, research groups that have a working system capable of processing a fair amount of text that uses knowledge about either text, domain, or both; *or* researchers with either a design for a knowledge model or theories about text and textuality, who have performed large-scale experiments on text to validate their ideas.

Participants should not only relate successes their approach has engendered but failures due to lack of knowledge or due to unsatisfactory modeling; other participants would be encouraged to discuss and offer contributions to the goal.

This symposium has as the following starting points:

- Information access tasks need text understanding. To move forward the research frontier in the general field of information access, one of the bottlenecks we need to address is understanding textual content somewhat better.
- Text understanding needs a theory. Knowledge modeling, semantics, or ontology construction are areas marked by the absence of significant consensus in points of theory, scope of application, or indeed, in evaluation of the theory itself.
- Information access tasks give focus to modeling. In our application areas—those in the general field of information access—external success criteria are well established.

We want to find out where we stand and what we can hope to achieve in the near future, given the above!

Submissions

We invite submissions of research abstracts (1-3 pages), position papers and, in particular, system demonstrations and experience reports on all subjects related to the acquisition and usage of linguistic knowledge in the information access field, including (but not limited to) (1) information access tasks; (2) techniques for acquiring knowledge from text; (3) knowledge representation formats; and (4) practical semantic theories.

Some “challenge questions” the participants might want to address:

- How does my model adjust to a new domain or to previously unknown material?
- How can the knowledge in my model be inspected, assessed, and hand-edited except in a near-full-scale trial?
- How well does the model perform in a large-scale trial? (By *any* metric!)
- What additional knowledge or theory does my model need to perform better?

Unsatisfactory answers are encouraged if they invite further cooperation between groups! Submissions should be sent by e-mail to Jussi Karlgren jussi@sics.se. For more argumentation and further information, please consult the symposium web page: www.sics.se/~jussi/aaaiss02.

Organizing Committee

Jussi Karlgren (chair), jussi@sics.se; Pentti Kanerva (cochair), pkanerva@csli.stanford.edu; Björn Gambäck (cochair), gamback@sics.se; Marti Hearst, hearst@sims.berkeley.edu; Robert Hecht-Nielsen, r@hnc.com; Tony Plate, Tony.Plate@biosgroup.com



Artificial Intelligence and Interactive Entertainment

Computer games and other forms of interactive entertainment are important sources of applications for artificial intelligence. For example, the computer game industry is already one of the major drivers of advances in computer hardware and software. AI in games is now often a major factor in the success or failure of a game. Advances in AI will also facilitate expanding the genres of games and the creation of new types of interactive entertainment. Thus building a community that includes both computer game designers/developers and AI researchers benefits everyone. Designers and developers can benefit from seeing the latest AI research advances and directions. AI researchers can benefit from seeing what actually works in practice and what interesting problems (and solutions) arise in creating interactive entertainment. The purpose of this symposium is to continue the community-building process that was started at previous symposia.

Submissions are encouraged both from the interactive entertainment industry and the AI research community. The kinds of topics of interest for this symposium include:

- Explorations of the state of the art of AI currently used in interactive entertainment, such as techniques used in a particular game
- Explorations of the potential impact of AI techniques or technologies on interactive entertainment, e.g., new ways to design/build bots and opponents
- What AI techniques or advances not currently used in industry might already be useful for computer games, interactive fiction, or software toys?
- What problems and constraints arising in interactive entertainment are being neglected by the research community?
- How can commercial interactive entertainment projects be used to support AI research?
- How can results from AI research be more quickly transitioned to the interactive entertainment industry?
- How can we strengthen the growing relationships between researchers, designers, and developers?

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. Please send submissions to Ken Forbus (forbus@northwestern.edu). All submissions must be made via e-mail. ASCII is preferred, although HTML or PDF files will be accepted.

Organizing Committee

Ian Davis, Mad Doc Software; Wolff Dobson, Visual Concepts Entertainment; Magy El-Nasr Seif, Northwestern University (cochair); Ken Forbus, Northwestern University (chair); John Laird, University of Michigan; Lars Linden, Valve Software; Andrew Stern, InteractiveStory.net; Michael van Lent, Institute for Creative Technologies



Collaborative Learning Agents

Recent advances in the multi-agent systems (MAS) field have generated optimism that widely applicable solutions to large, distributed problems may be at hand. However, before the field can deliver on that promise, the challenge of how to control such systems to address a prespecified goal (e.g., minimize throughput of packets in data routing, win the game in soccer) in a decentralized, adaptive manner with minimal detailed hand-tuning needs to be met.

In this symposium we focus on two crucial properties that would allow a MAS to meet those challenges: (1) the agents need to work collectively so that as a group, their behavior solves the overall problem; and (2) both the agents and their collaborative structure need to be adaptive.

The first property is crucial in large problems (e.g., internet routing), and inherently distributed problems (e.g., planetary exploration rovers, constellations of satellites), in that it enables a modular approach to the problem. The importance of the second property lies in how the agents interact with one another and the environment. Because both the environment and the response of other agents to changes in that environment will modify the “background” state one agent perceives before choosing its actions, it is imperative that adaptivity be built in to those agents.

Our focus in this symposium will be to address the design of systems that are intended to solve large, distributed computational problems with little to no handtailoring through the collective and adaptive behavior of the agents comprising that system.

Submissions

We encourage submissions in the following areas:

(1) off-equilibrium behavior of multi-agent systems; (2) learning agents in collaborative environments; (3) selfish agents that cooperate “unintentionally”; (4) formation of teams or coalitions of agents; (5) behavior changes in “team player” agents; (6) adaptivity in the interaction structure for the agents; (7) scaling in collaborative multiagent systems; (8) applications/limitations of economic principles; (9) applications/limitations of game theory.

Those interested in participating should e-mail the URL of either a brief statement of interest (1 page), or complete paper (8-page) including keywords and authors’ complete addresses to pstone@research.att.com and kagan@ptolemy.arc.nasa.gov. Papers and statements of interest should be in one of the following formats: PostScript, PDF, or HTML. For further information visit www.research.att.com/~pstone/Workshops/2002aai. Direct all questions and inquiries to the cochairs.

Organizing Committee

Peter Stone (cochair), AT&T Labs-Research (pstone@research.att.com); Kagan Tumer (cochair), NASA Ames Research Center (kagan@ptolemy.arc.nasa.gov); Piotr Gmytrasiewicz, University of Texas, Arlington; Amy Greenwald, Brown University; Michael Littman, AT&T Labs-Research; Akira Namatame, National Defense Academy of Japan; Manuela Veloso, Carnegie Mellon University; Jose Vidal, University of South Carolina; David Wolpert, NASA



Information Refinement and Revision for Decision Making: Modeling for Diagnostics, Prognostics, and Prediction

Many companies have discovered the value of preserving and maintaining their corporate knowledge as they are collecting large amount of process data and business information. This collection is accelerated by the use of advanced and less expensive sensors, massive information storage, and internet-facilitated access. As a result, diagnostic decision makers are faced with the daunting task of extracting relevant morsels from this information hodge-podge, dealing with conflicting information, repudiating stale and outdated information, and evaluating the merits of a found solution. Automated decision-making systems also need to heed the effect of degrees of redundancy in the information considered, which may skew the decision pursued. In addition, temporal effects play a major role in the decision making process not only because information integrity fades over time but also because new information needs to be factored in. Although this new information does not exist at the time of the system design, one must provide a system maintenance plan to account for it. Ways to judge the relevance of this new information and optimization issues need to be discussed in this context. Finally, the quality and uncertainty of the newly found system and its resulting decisions need to be evaluated.

This symposium will explore some of the following topics within that context: (1) conflict resolution; (2) information half-life; (3) adaptive optimization; (4) uncertainty management; (5) distributed evolutionary agents; (6) temporal information updating; (7) link discovery in large databases; (8) distributed resource management; (9) aggregation of heterogeneous information; (10) distributed multiple hypothesis management; (11) automated updating of classification systems; (12) maintenance of decision making units over time; (13) multi-criteria decision making based on changing information; (14) postponement of commitments in design analysis; and (15) interactive tradeoff analysis between search and decision.

Submissions

Potential participants should submit either a full technical paper (8 pages maximum); a statement of interest (up to 1,000 words) describing an ongoing research effort; a position statement; a description of a problem to be discussed; or a description of tools, corpora, or other resources—especially if they can be shared with others. Send all submissions electronically to goebelk@crd.ge.com. If you are unsure whether your file will print at our site, please submit four days before the deadline in order to receive a confirmation to Kai Goebel, GE Corporate Research and Development, K1-5C4A, One Research Circle, Niskayuna, NY 12309 USA. More information is available at the web site: best.me.berkeley.edu/~goebel/ss01/index.html

Organizing Committee

Alice Agogino, University of California, Berkeley (aagogino@euler.me.berkeley.edu); Piero Bonissone, GE Corporate Research & Development (bonissone@crd.ge.com); Kai Goebel, GE Corporate Research & Development (goebelk@crd.ge.com); Soundar R.T. Kumara, The Pennsylvania State University (skumara@psu.edu); Karl Reichard, The Pennsylvania State University (kmr5@psu.edu); George Vachtsevanos, Georgia Institute of Technology (george.vachtsevanos@ee.gatech.edu); Xenofon Koutsoukos, Xerox PARC (koutsouk@parc.xerox.com)



Intelligent Distributed and Embedded Systems

This symposium will focus on the emerging challenges associated with large-scale distributed embedded systems for sensing and acting. As embedded sensor/actuator networks become pervasive in everyday life, there is an exciting research opportunity for the AI and Robotics communities to apply their expertise to cope with constrained sensing, noisy communication, and uncertainty which characterize the control and coordination problems in this domain.

One aim of this meeting is to bring together three communities to facilitate this research: distributed ai, distributed robotics, and networking and communications. The first two are well-represented at other AAAI Spring Symposia but the third is traditionally not. We believe this cross-fertilization is important for both sides. It also serves to highlight to the external world, the AI/robotics impact on embedded systems.

We expect participants to contribute papers addressing (but not limited to) the following issues:

- Coordination and control of distributed agents, including robots
- Intelligent distributed systems
- Data dissemination and fusion in embedded sensor networks
- Sensor networks for novel applications (e.g. environmental monitoring, biology, pedagogical applications etc.)
- Programming methodologies for large-scale, distributed embedded systems
- Sensor/actuator networks
- Distributed systems for observing and modeling

Submissions/Organizers

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Logic-Based Program Synthesis: State of the Art & Future Trends

Automatic programming has long been considered a core AI task. Some logic-based program synthesis systems have been developed and applied to different problem domains (e.g., Amphion, KIDS, Nuprl, Oyster/Clam). Yet, logic-based program synthesis is not a common approach to software development. The purpose of this symposium is to survey the current state of the art, to identify barriers, and to discuss directions which can help make it more feasible. Key topics include:

- *Representation of design knowledge*: formalizing, organizing, and applying design theories about software architectures, algorithms, data structures, communication protocols, code optimizations, as well as domain-specific design knowledge.
- *Issues in constructive theorem-proving*: most logic-based program synthesis has focused on witness-finding in first-order logics and propositional temporal logics. Specialized logics and algebraic theories can have more efficient witness-finding procedures. How can specialized inference systems, such as symbolic-algebraic systems, be integrated and used in synthesis?
- *Issues in scaling up*: Typically, relatively small programs are being generated by synthesis systems. What techniques are available for scaling up?
- *Role of synthesis in component-based approaches to system development*: deductive support for component reuse, synthesis of data translators and wrappers, composition and refinement of connectors, generation of interaction plans, protocol composition and synthesis, generation of run-time gauges to measure and control system behavior.
- *Domains amenable for synthesis*: are there some general characteristics which make an application domain more (or less) amenable for logic-based program synthesis?
- *Support for certification*: software for safety-critical applications is subject to certification, whether it is synthesized or not. How can synthesis support certification? Can it be parameterized with a certification policy?

Submissions

Potential participants should submit either a position statement (2-3 pages) describing their interest in program synthesis, an extended abstract (up to 5 pages), or an original technical paper (up to 10 pages), but the shorter submission forms are highly encouraged. Description of work in progress or recently completed work is very appropriate for the symposium; we especially solicit system descriptions. Electronic submissions are preferred, in plain ASCII, PDF, or PostScript. Please e-mail submissions to Bernd Fischer (fisch@e-mail.arc.nasa.gov) or Doug Smith (smith@kestrel.edu). For further information, see ase.arc.nasa.gov/aaai2002

Organizing Committee

B. Fischer (cochair), RIACS/NASA Ames, USA; D. Smith (cochair), Kestrel Institute, USA; D. Basin, U. Freiburg, Germany; A. Bundy, U. Edinburgh, UK; Y. Deville, U. Louvain, Belgium; P. Flener, U. Uppsala, Sweden; C. Green, Kestrel Institute, USA; C. Kreitz, Cornell, USA; M. Lowry, NASA Ames, USA; J. Richardson, Herriot-Watt, UK; R. Waldinger, SRI, USA; J. Whittle, QSS/NASA Ames, USA



Mining Answers from Texts and Knowledge Bases

The rate of producing textual documents is quite larger than the rate of generating reliable knowledge bases and associated reasoning mechanisms. However, the information expressed in various on-line textual documents, either on the Internet or in large text repositories cannot be used for complex, real-world tasks unless it is associated with expert knowledge bases. The incorporation of textual information into knowledge bases is not simple, due to the multiple forms of ambiguities that characterize natural language texts. However, today we are in the position of having sufficiently large knowledge bases available and the natural language processing technologies have matured enough to process real-world documents and extract information and answer natural language questions with good accuracy.

This symposium is aimed at exploring diverse techniques for text and answer mining from AI (more specifically natural language processing, machine learning, knowledge representation and reasoning) with information retrieval (from text collections or from the Web) or data tracking and detection. The following topics are of interest in this context: methods of rapidly and reliably mining texts and uncovering new, unexpected data; approaches of finding answers, within contexts and through multiple interactions; techniques of employing rapidly formatted knowledge bases for advance reasoning imposed by complex questions and integration of knowledge mined from texts with expert knowledge bases. The symposium shall also address the aspect of multilinguality of information on current Web pages, the ability of generating parallel corpora and their usage to validate the competence of text and answer mining.

If you are interested in participating in this symposium, please submit either an extended abstract or position paper by the submission date to the symposium chairs.

Organizing Committee

Sanda Harabagiu (cochair), Southern Methodist University (sanda@engr.smu.edu); Vinay Chaudhri (cochair), SRI International (chaudhri@ai.sri.com); Bruce Porter, University of Texas Austin; Ray Mooney, University of Texas Austin; Tom Mitchell (tentative), Carnegie-Mellon University; Claire Cardie, Cornell University; Richard Fikes, Stanford University; Dan Moldovan, Southern Methodist University; Srinivas Narayanan, SRI International; Donna Harman, NIST.



Safe Learning Agents

Since Weld and Etzioni's "The First Law of Robotics" at AAAI in 1994, there has been growing concern with the safety of deploying intelligent agents in the real world. Perhaps HAL in Kubrick's *2001: A Space Odyssey* is the best image of such an agent gone wrong.

One area often missing from such discussions is the safety of learning agents. This is an important omission since learning/adaptation is a component in most definitions of what it means to be an agent. Some recent work has begun to address some of the issues involved, but the field is still in the initial stages of defining the problem.

A safe agent is one which can efficiently find and execute acceptable solutions for its target problems. Learning can adversely affect which problems the agent can solve, the efficiency with which they come up with plans to solve them, and the quality of the solutions. Thus learning can cause a "safe" agent to become "unsafe." Some topics of interest are:

- Challenges of safe learning agents
- Taxonomies of how learning can adversely affect an agent's safeness.

Also of interest are the relationships between:

- Agent architectures and safe learning
- Search control languages and safe learning
- Plan representation and safe learning
- Type of learning and types of safety guarantees
- Safe learning and restricted problem classes
- Learning and safe execution
- Learning and revalidation of agent safeness
- Safe learning when humans are in the loop
- Safe learning and societies of agents

The symposium will be scheduled to provide extensive discussion time and group interactions. It will consist of a series of paper presentations (20-30 minutes) with significant question-and-answer time following each paper, as well as topic-oriented group discussion sessions.

Submissions

Those interested in participating should send either a 1-3 page extended abstract or a 6-8 page paper describing their related work and areas of interest. Electronic submissions of PostScript or PDF files in AAAI format are preferred and should be sent to Hans Guesgen at hans@cs.auckland.ac.nz.

Organizing Committee

Mike Barley (cochair), University of Auckland, New Zealand (barley@cs.auckland.ac.nz); Hans W. Guesgen (cochair), University of Auckland, New Zealand (hans@cs.auckland.ac.nz); Ella M. Atkins, University of Maryland (atkins@eng.umd.edu); Diana Gordon, Naval Research Laboratory (gordon@aic.nrl.navy.mil); Daniel G. Shapiro, Stanford University (dgs@stanford.edu)



Sketch Understanding Symposium

This symposium will explore the topic of sketch understanding. By the term “sketch,” we mean an informal drawing created with pen strokes. By “understanding” we mean the task of reliably identifying the objects or concepts suggested by a set of pen strokes, despite the inherent inaccuracies and ambiguities. One measure of understanding is the ability to answer questions about the things depicted. For example, if one “understands” a sketch of a physical device, one should be able to answer questions about how the device would operate, what it might be useful for, how it might be constructed, etc. This symposium will consider all of the different levels of sketch understanding, starting with the low-level gathering and processing of pen signals up to the high-level reasoning about the things depicted.

The symposium has two primary objectives. The first is the dissemination of initial research results. The second is to establish a research agenda for this emerging research field. These objectives will be facilitated by presentations of technical and position papers, demonstrations of research software and hardware, and panel discussions. The symposium will culminate with a collaboratively produced, refined research agenda.

Topics of interest include:

- What is the role of context in sketch understanding?
- How is knowledge of how the sketch was drawn useful in understanding what the sketch means?
- What kind of domain specific knowledge is needed to interpret a sketch?
- What kind of general, domain independent knowledge is useful?
- What kinds of information can be extracted from a sketch?
- What kinds of inferences are needed to interpret a sketch?
- What is the role of speech in sketch understanding?
- What is the role of sketch understanding in sketch beautification?
- When is communicating the underlying sketch understanding inappropriate?
- What domains and applications can get away with minimal sketch understanding?
- Other related topics

Participants are invited to contribute (1) technical papers describing proposed or completed research activities; (2) scene setting papers describing the history of the field and the current landscape; (3) position papers outlining a research agenda for the field; (4) position papers evaluating current ideas and approaches; (5) interactive software and hardware demonstrations; or (6) panel discussions.

More information can be found at www.me.cmu.edu/faculty1/stahovich/sketchsymposium.htm.

Organizing Committee

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