



AAAI 1995
Spring Symposium Series

March 27 – 29, 1995
Stanford University, California

Call for Participation

Sponsored by the
American Association for Artificial Intelligence
445 Burgess Drive, Menlo Park, CA 94025
(415) 328-3123
sss@aaai.org

THE AMERICAN ASSOCIATION for Artificial Intelligence presents the 1995 Spring Symposium Series, to be held Monday through Wednesday, March 27 - 29, 1995, at Stanford University.

The topics of the nine symposia in the 1995 Spring Symposium Series are:

- Empirical Methods in Discourse Interpretation and Generation
- Extending Theories of Action: Formal Theory and Practical Applications
- Information Gathering from Heterogeneous, Distributed Environments
- Integrated Planning Applications
- Interactive Story Systems: Plot and Character
- Lessons Learned from Implemented Software Architectures for Physical Agents
- Representation and Acquisition of Lexical Knowledge: Polysemy, Ambiguity, and Generativity
- Representing Mental States and Mechanisms
- Systematic Methods of Scientific Discovery

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.

A general plenary session, in which the highlights of each symposium will be presented, will be held on Tuesday, March 28, and an informal reception will be held on Monday, March 27.

In addition to invited participants, a limited number of other interested parties will be able to register in each symposium on a first-come, first-served basis. Registration will be available by January 1, 1995. To obtain registration information write to the AAAI at 445 Burgess Drive, Menlo Park, CA 94025 (sss@aaai.org).

Submission Dates:

Submissions for the symposia are due on October 28, 1994. Notification of acceptance will be given by November 30, 1994. Material to be included in the working notes of the symposium must be received by January 20, 1995. See the appropriate section below for specific submission requirements for each symposium.

This document is available as <http://www.ai.mit.edu/people/las/aaai/sss-95/sss-95-cfp.html>



Empirical Methods in Discourse Interpretation and Generation

Computational theories of communicative action (discourse interpretation and generation) provide the basis for the design of many types of AI systems (such as intelligent tutors, believable agents, intelligent spoken language systems, intelligent software agents [softbot], etc.) Developing the robust, broad coverage, theories of discourse that are needed in today's systems requires an empirical basis. However, there are no shared methods, tools or resources for the discourse community. To date, much work in computational theories of discourse has focused on specifying the mechanisms underlying a particular discourse phenomenon. It is often difficult to tell how prevalent that phenomenon is, whether it is related to other observed and studied phenomena, and what percentage of the cases a particular theory covers.

This symposium has two foci: First, an investigation of the empirical methods that can be used in the development and evaluation of computational theories of discourse, and second, the development of a set of shared resources for the computational discourse community. We solicit papers that focus on empirical methods and their benefits, e.g., by presenting an empirical method and a result derived using that method, including but not limited to the following topics:

- Corpus-Based methods as applied to theories of discourse.
- Methods for evaluating dialogue or discourse modules in implemented systems.
- Simulation tools or testbeds used in developing and evaluating theories of discourse.
- Coding schemes developed and tested for the quantitative study of some discourse phenomenon, particularly papers that show that multiple judges can use the coding scheme with replicable results.
- Tools that support (semi-)automatic or empirical studies of discourse phenomena.
- Papers that apply or extend methods used in traditionally empirical disciplines (such as psychology or sociolinguistics) to computational theories of discourse.
- Empirical analyses using any method that distinguishes between claims made by different computational discourse theories.

Interested participants should submit six copies of either a paper (not to exceed 3,000 words) addressing one of the above points, or a statement of interest briefly describing the author's relevant work in this area and listing recent relevant publications.

Send contributions—plain ascii or postscript—to walker@merl.com. If it electronic submission is impossible, please send six copies to Marilyn Walker, Mitsubishi Electric Research Laboratories, 201 Broadway, Cambridge, MA 02139 (phone: 617-621-7505; fax: 617-621-7550).

Organizing Committee: Marti Hearst, Xerox PARC; Lynette Hirschman, MITRE; Aravind Joshi, University of Pennsylvania; Johanna Moore (cochair), University of Pittsburgh, jmoore@cs.pitt.edu; Marilyn Walker (cochair), Mitsubishi Labs, walker@merl.com.



Extending Theories of Action: Formal Theory and Practical Applications

Action and its representation continues to play a central role in many areas of AI research. The research focus in these areas — including knowledge representation, planning, reasoning under uncertainty, control theory and decision theory—has often been motivated by different issues and types of problems, or based on different underlying assumptions. Representations vary widely, ranging from logical specifications to influence diagrams and belief nets to less complex, but more computationally manageable planning representations. The assumptions and reasoning methods adopted are also quite different. Techniques include state- and plan-space search, regression, logical inference, network algorithms and analytical methods.

This symposium will bring together researchers in diverse fields of AI. The focus will be two-fold: evaluating the state of the art, especially identifying the issues and assumptions central to different fields; and identifying relevant research issues for extending our theories and putting these theories into practice.

We invite extended abstracts (maximum of five pages) on action of two sorts:

- Technical papers addressing issues or proposing methods for representing/reasoning about action (especially contributions that draw from or bring together different approaches). Reports on work in progress are welcome.
- Position papers advocating particular approaches or steps toward

integrating ideas from different communities. Authors are strongly encouraged to read a long version of this document for a specific list of topics and questions. This can be retrieved by anonymous FTP at [ftp.cs.ubc.ca:pub/local/SSS95/CFP](ftp://ftp.cs.ubc.ca:pub/local/SSS95/CFP) or via the URL

<http://www.cs.ubc.ca/ftp/local/SSS95/type/CFP.html>

Others interested in attending should submit a statement of interest (a maximum of two pages) describing his or her relevant research.

Electronic submissions are strongly encouraged and should be sent to action@cs.ubc.ca.

Paper submissions should be sent to:

Craig Boutilier
Department of Computer Science
University of British Columbia
Vancouver, British Columbia
Canada, V6T 1Z4

Inquiries should be directed to either cochair.

Organizing Committee: Craig Boutilier (co-chair), University of British Columbia, cebly@cs.ubc.ca; Tom Dean, Brown University; Moises Goldszmidt (cochair), Rockwell, moises@rpal.rockwell.com; Steve Hanks, University of Washington; David Heckerman, Microsoft; Ray Reiter, University of Toronto.



Information Gathering from Heterogeneous, Distributed Environments

We are currently witnessing an explosion in the amount of information that is available from various sources, such as the Internet. A challenge to AI researchers is to develop tools and techniques for providing better access to the wealth of available information. The purpose of this workshop is to bring together researchers working on topics relating to information gathering in heterogeneous and distributed environments. Relevant topics include, but are not limited to the following:

- Knowledge representation (for example, what meta-data to represent about information sources, and how to represent such data).
- Reasoning (for example, query languages, efficient query answering algorithms, processing to reduce the volume of retrieved data by means of abstraction and summarization).
- Planning (for example, generating plans for accessing information sources, interleaving planning and execution, dealing with incomplete information).
- Learning (for example, learning about the contents of information sources).
- Knowledge sharing (for example, languages and protocols for communicating knowledge about information sources, acquiring knowledge from users or other systems).
- Distributed AI (for example, coordination and control of agents for accessing information sources).

Persons wishing to make presentations at the workshop should submit short abstracts (up to 5 pages, 12 point font). Papers will be required to emphasize how their work is particularly relevant to information gathering. Persons wishing only to attend the workshop should submit a 1–2 page research summary. There will be a Fall AAAI Symposium on AI and Knowledge Navigation, focusing on browsing, navigation, and user interfaces for large information spaces. Work on these topics should be sent to the fall symposium.

Submissions should be sent as follows. Send to one of the coauthors — knoblock@isi.edu or levy@research.att.com—the network address containing a postscript version of the paper, or send postscript files by email, or send 5 paper copies to:

Craig Knoblock
AAAI Spring Symposium
USC/Information Sciences
Institute
4676 Admiralty Way
Marina del Rey, CA 90292.

Organizing Committee: Su-Shing Chen, National Science Foundation; Craig Knoblock (cochair), USC Information Sciences Institute, knoblock@isi.edu; Alon Levy (cochair), AT&T Bell Laboratories, levy@research.att.com; Gio Wiederhold, Stanford University.

Program Committee: Ronald Brachman, AT&T Bell Laboratories; Robin Burke, University of Chicago; Oren Etzioni, University of Washington; Robert Kahn, Corporation for National Research Initiatives; Yoav Shoham, Stanford University.



Integrated Planning Applications

The planning field has finally begun to take on real, or at least realistic, applications. Traditionally, a key application for planning systems has been robotics. Recently, however, new areas for application have emerged, including planning for data analysis tasks, database access, virtual reality environments or other types of simulated environments, medical applications, factory automation, and instrument control. Invariably, once a planning application becomes realistic, issues arise regarding the *integration* of the planning system with its environment.

The goal of this symposium is to explore this boundary between planning systems and their environments. We solicit papers on existing planning applications rather than on theoretical techniques or scenarios.

Possible topics include: User interaction with the planning process, planner/environment feedback, fidelity between planning model and external environment or system, domain knowledge acquisition, flexible control and data exchange between multiple components, and representations and analysis tools to support integration.

We also encourage authors to focus on lessons learned from the planner-integration process or on planner features that foster or inhibit usability and integration for a particular domain. For example, papers should address such questions as: What was the most difficult aspect of this problem? What did you think would be difficult that was surprisingly easy? If you used a hybrid solution, why? To

what degree did the solution require parameter tuning and how was it accomplished?

Finally, we encourage participants to provide, in addition to their paper submissions, domain knowledge for their particular application. This would result in a compendium of planning tasks that could be shared by other experimental researchers.

Half of the workshop will consist of presentations of selected accepted papers. We hope to have long talks, to allow for adequate time to describe planning application details. In addition, at least one senior researcher in the field will be asked to present an invited talk. Finally, panel discussions will focus on particular issues regarding planner integration. We hope to disseminate accepted papers in advance of the workshop.

Those wishing to participate should submit five copies of a short paper (approximately 5 pages) as well as, optionally, domain knowledge for their application. Those only wishing to attend should submit five copies of a one-page research statement and bibliography. Please include your email address, telephone number and US mail address in all submissions. Submit to: Adele Howe, Chair, AAI Spring Symposium, Computer Science Department, Colorado State University, Ft Collins, CO 80523 Phone: (303) 491-7589, fax: (303) 491-2466

Organizing Committee: Marie desJardins, SRI International; Adele Howe (chair), Colorado State, howe@cs.colorado.edu; Amy Lansky, NASA Ames; Robin Murphy, Colorado School of Mines.



Interactive Story Systems: Plot and Character

We will explore conceptual, technical, and artistic issues involved in integrating plot and character to create interactive story systems—simulated dramatic situations in which human users actively participate. Relevant AI topics include: integrated agents; multi-agent communication and coordination; agent motivation, emotion, and believability; representation, construction, and interpretation of plot structure; natural language production and understanding; real-time perception, reasoning, and action; user interface; user modeling. We seek contributions that directly relate AI or artistic issues to interactive story systems.

Symposium sessions will be organized around alternative design concepts for different aspects of interactive story systems. The idea is *not* to argue that a particular concept is the correct one. The idea is to *assume* that a given concept is a good one and then discuss techniques, questions, issues, results related to that concept. For each concept, we will have a mix of speakers reporting related work and facilitators raising questions and issues for discussion. The actual set of design concepts addressed in the symposium will be based on the interests of the participants. Here are a few likely examples:

- *Good interactive stories emerge from:* (a) the autonomous behavior of characters; (b) the semi-autonomous behavior of characters constrained by an abstract plot structure; (c) real-time direction of agents by an expert story-master.

- *Characters act the way they do because:* (a) that's who they are; (b) that's the impression they are trying to create on the audience; (c) they follow a script.
- *Plot structures and characters are crafted by:* (a) professional authors; (b) a computer-based author; (c) the user.
- *Users participate at run-time as:* (a) characters in the story; (b) advisors to otherwise autonomous characters; (c) run-time story directors.
- *Users are guided by:* (a) advance instructions; (b) run-time guidance; (c) the natural course of events.

Please submit 2-3 pages summarizing your relevant research or artistic activities and highlighting your design concepts, such as those listed above. Include a mailing address, telephone number, fax number, and email address. We strongly prefer electronic submission of plain unformatted text to: joseph.bates@cs.cmu.edu. If this is impossible, send hard copy to:

Joseph Bates
School of Computer Science,
Carnegie Mellon University
5000 Forbes Avenue
Pittsburgh, PA 15213
(telephone: 412-268-3725).

Organizing Committee: Joseph Bates, CMU, joseph.bates@cs.cmu.edu; Barbara Hayes-Roth, Stanford, bhr@ksl.stanford.edu; Pattie Maes, MIT, pattie@media.mit.edu



Lessons Learned from Implemented Software Architectures for Physical Agents

The goal of this workshop is to shed light into reasons for architectural decisions in building artificial agents. Many important questions affect architectural decisions. For this symposium, we ask questions like the following only with respect to architectural decisions.

How should the agent arbitrate/coordinate/cooperate its behaviors and actions? How can human expertise be easily brought into an agent's decisions? How much internal representation of knowledge and skills is needed? How should the computational capabilities of an agent be divided, structured, and interconnected? What types of performance goals and metrics can realistically be used for agents operating in dynamic, uncertain, and even actively hostile environments? Why should we build agents that mimic anthropomorphic functionalities? What, if any, role can advanced simulation technology play in developing and verifying modules and/or systems? How can a given architecture support learning?

To allow for a more practical discussion of the issues, all submissions should focus on an agent or agents performing a specific task, such as keeping a house clean, maintaining the space station, or delivering parts on a factory floor. Be very specific about how your agent(s) organize(s) its knowledge and skills in order to perform this task and what mechanisms your agent(s) use(s) to invoke

the correct knowledge or skill at the appropriate time.

Potential attendees should submit either an extended abstract or a full paper, not to exceed 20 pages. We prefer original submissions. If you are sending a published paper, tell us where it appeared. E-mail submissions should be sent to: hexmoor@cs.buffalo.edu. Alternatively, three paper copies of the paper should be sent to

Henry Hexmoor
AAAI Spring Symposium
226 Bell Hall
Dept of Computer Science
SUNY at Buffalo
Buffalo, NY 14260

Further information on this symposium may be found at: <http://tommy.jsc.nasa.gov/er/er6/mrl/symposium.html>

Organizing Committee: Ron Arkin, Georgia Tech; Peter Bonasso, MITRE; Henry Hexmoor (cochair), SUNY Buffalo, hexmoor@cs.buffalo.edu; David Kortenkamp (cochair), MITRE, korten@aio.jsc.nasa.gov; David Musliner, University of Maryland.



Representation and Acquisition of Lexical Knowledge: Polysemy, Ambiguity, and Generativity

The lexicon is at the core of many NL, IR, and KR systems, and thus can play a central role in determining the success or failure of the endeavor. Nonetheless, points of sharp controversy have arisen concerning the most flexible and powerful way to represent the extensive variety of lexical information required to drive robust applications. We intend this symposium to provide a forum to discuss problematic issues of lexical representation, and ways to solve difficult and complex questions.

Despite the fact that the need for a common lexicon has been a recent research focus, there is no general agreement on a lexical representation that is both complete enough for specification of even basic syntactic environments, and flexible enough to handle the productivity and underspecification that are required for representing lexical semantics. The focus of the symposium will be on ways to determine the optimal representation for the lexical knowledge needed in flexible broad-coverage lexicons, as well as on the acquisition of that knowledge.

Relevant interest areas include: Natural language processing, information retrieval, knowledge representation, cognitive science, psychology, philosophy, and others. Those wishing to attend without presenting should submit a brief description of their research interests and opinions, and a list of relevant

publications.

The symposium will maintain a balance between theoretical and applications oriented papers. Authors should identify precisely how the paper is relevant to the topic, what specific problems are addressed, and a clear statement of what solutions are proposed. Well-grounded controversial positions are encouraged.

Authors should submit extended abstracts of up to 2000 words in 12-point font electronically to klavans@cs.columbia.edu with a hard-copy backup to:

Judith L. Klavans
Department of Computer Science
Columbia University
500 W 120th Street
New York, NY 10027, USA
Phone: 212-939-7120
Fax: 212-666-0140.

Organizing Committee: Bran Boguraev, Apple Computer; Judith Klavans (chair), Columbia University, klavans@cs.columbia.edu; Lori Levin, Carnegie Mellon University; James Pustejovsky, Brandeis University.



Representing Mental States and Mechanisms

The ability to reason about mental states and cognitive mechanisms facilitates performance at a variety of tasks. The purpose of this symposium is to enhance our ability to construct programs that employ common-sense knowledge of the mental world in an explicit representational format that can be shared across domains and systems. Such knowledge can, for example, assist story-understanding programs to understand characters that learn, forget, pay attention, make a decision, and change their mind.

The need to represent knowledge of mental activity transcends usual disciplinary boundaries to include most reasoning tasks where systems interact with users, coordinate behaviors with autonomous agents, or consider their own beliefs and limitations. For example, distributed problem-solving agents can use knowledge of mental phenomena to predict and explain the behavior of cooperating agents.

In machine learning, a system's knowledge of its own mental states, capacities and mechanisms crucially determines the reliability with which it can diagnose and repair reasoning failures. The focus of the symposium, however, is on representation of the mental world and the sharing/reuse of such representations, rather than the applications that such representations support.

Important questions to consider:

- *Sharability*: What tools/techniques can facilitate the sharing of representations among researchers?
- *Reuse*: What portions of the representation can be transferred across

reasoning tasks?

- *Architecture*: How can functional models of reasoning-components be represented explicitly?
- *Logical form*: What statements can be logically asserted about the self and its beliefs? What benefits arise from such representations?
- *Applications*: How can knowledge of mental phenomena be used in tasks ranging from student instruction to intelligent interface control?
- *Introspection*: What must an intelligent system know about its own mental states and processes?

The symposium will consist of invited talks, individual presentations, and group discussion. "Key position" papers describing possible topics for submitted papers will be available at the following network address. Please monitor the web for additional information: ftp://ftp.cc.gatech.edu/pub/ai/symposia/aaai-spring-95/home_page.html. If you wish to present, submit up to 12 pages (12-point, 1 in. margins). Others interested in attending should submit a research abstract or position paper (3-pp. max). Financial assistance is available for student participation. Submit 1 postscript copy to freed@picasso.arc.nasa.gov or 4 hard copies to Michael Freed, MS 262-2 NASA ARC, Moffett Field, CA, 94035.

Organizing Committee: Gregg Collins, Northwestern.; Michael Cox (cochair), Georgia Tech, cox@cc.gatech.edu; Michael Freed (cochair), NASA Ames, freed@picasso.arc.nasa.gov; Bruce Krulwich, Andersen Consulting, CSTaR; Cindy Mason, NASA Ames; John McCarthy, Stanford; John Self, Lancaster U.



Systematic Methods of Scientific Discovery

Scientific discovery is among the most celebrated creative processes, and receives scholarly attention from several disciplines including AI. One view is that much scientific reasoning is problem solving and is akin to ordinary reasoning. Experience has shown that some scientific reasoning can be automated. Where all this may lead was foreseen by Allen Newell:

[The field] should be prepared for some radical, and perhaps surprising transformations of the disciplinary structure of science as information processing pervades it. The sciences will find themselves increasingly taking a metaposition, in which doing science will involve understanding these information processes, and building systems that do the object-level science. Then the boundaries between the enterprise of science as a whole and AI will become increasingly fuzzy. [abridged]

We solicit contributions that advance Newell's vision, including:

- A program that automates a complex and creative scientific task.
- A new systematic method of scientific inference, even if its automation is not yet feasible.
- A new representation or classification of science that enhances efforts to systematize it.
- New opportunities for known systematic methods.
- A recent scientific achievement where the computer played an essential creative role.
- New heuristics for scientific research, for example, that promise to make practicable some aspect of automated scientific reasoning.

- Computational models of historical discoveries in science.
- Cognitive studies of the scientific process that promise to contribute to computational approaches.

Contributions that potentially bear on more than one scientific area and that are demonstrably effective are of special interest.

Prospective participants are invited to submit (in paper form) one of the following to the symposium chair: three copies of an extended abstract (at most 5 pages) of work to be presented, a description of research in progress, or a statement describing what you hope to contribute to and gain from the symposium.

Please send submissions and information requests to

Raul Valdes-Perez
Computer Science Department
Carnegie Mellon University
Pittsburgh, PA 15213 USA
Phone: (412) 268-7127
Fax: (412) 621-5117.

Organizing Committee: Lindley Darden, Maryland; Joshua Lederberg, Rockefeller; Herbert Simon, Carnegie Mellon; Derek Sleeman, Aberdeen; Raul Valdes-Perez (chair), Carnegie Mellon, valdes@cs.cmu.edu.