

**AAAI 1995**  
**Fall Symposium Series**

*November 10 – 12, 1995*  
*Massachusetts Institute of Technology*  
*Cambridge, Massachusetts*

**Call for Participation**

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

**T**he American Association for Artificial Intelligence presents the 1995 Fall Symposium Series, to be held Friday through Sunday, November 10 – 12, 1995, at the Massachusetts Institute of Technology. The topics of the eight symposia in the 1995 Fall Symposium Series are:

- **Active Learning**
- **Adaptation of Knowledge for Reuse**
- **AI Applications in Knowledge Navigation and Retrieval**
- **Computational Models for Integrating Language and Vision**
- **Embodied Language and Action**
- **Formalizing Context**
- **Genetic Programming**
- **Rational Agency: Concepts, Theories, Models, and Applications**

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 Saturday, November 11, and an informal reception will be held on Friday, November 10.

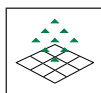
In addition to invited participants, a limited number of other interested parties will be able to register in each symposium on a first-come, first-served basis. Registration will be available by 1 August, 1995. To obtain registration information write to the AAAI at 445 Burgess Drive, Menlo Park, CA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

## Submission Dates

- Submissions for the symposia are due on April 14, 1995.
- Notification of acceptance will be given by May 19, 1995.
- Material to be included in the working notes of the symposium must be received by September 1, 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/fss-95/fss-95-cfp.html>



## Active Learning

An active learning system is one that can influence the training data it receives by actions or queries to its environment. Properly selected, these actions can drastically reduce the amount of data and computation required by a machine learner. Active learning has been studied independently by researchers in machine learning, neural networks, robotics, computational learning theory, experiment design, information retrieval, and reinforcement learning, among other areas. This symposium will bring researchers together to clarify the foundations of active learning and point out synergies to build on.

### Submission Information

Potential participants should submit a position paper (at most two pages) discussing what the participant could contribute to a dialogue on active learning and/or what they hope to learn by participating. Suggested topics include:

**Theory:** What are the important results in the theory of active learning and what are important open problems? How much guidance does theory give to application?

**Algorithms:** What successful algorithms have been found for active learning? How general are they? For what tasks are they appropriate?

**Evaluation:** How can accuracy, convergence, and other properties of active learning algorithms be evaluated when, for instance, data is not sampled randomly?

**Taxonomy:** What kinds of informa-

tion are available to learners (e.g. membership vs. equivalence queries, labeled vs. unlabeled data) and what are the ways learning methods can use them? What are the commonalities among methods studied by different fields?

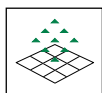
Papers should be sent to David D. Lewis, lewis@research.att.com, AT&T Bell Laboratories, 600 Mountain Ave., Room 2C-408, Murray Hill, NJ 07974-0636. Electronic mail submissions are strongly preferred.

### Symposium Structure

The symposium will be broken into sessions, each dedicated to a major theme identified within the position papers. Sessions will begin with a background presentation by an invited speaker, followed by brief position statements from selected participants. A significant portion of each session will be reserved for group discussion, guided by a moderator and focused on the core issue for the session. The final session of the symposium will accommodate new issues that are raised during sessions.

### Organizing Committee

David A. Cohn (cochair), MIT, cohn@psyche.mit.edu; David D. Lewis (cochair), AT&T Bell Labs, lewis@research.att.com; Kathryn Chaloner, U. Minnesota; Leslie Pack Kaelbling, Brown U.; Robert Schapire, AT&T Bell Labs; Sebastian Thrun, U. Bonn; Paul Utgoff, U. Mass Amherst.



## Adaptation of Knowledge for Reuse

Several areas in AI address issues of creating and storing knowledge constructs (such as cases, plans, designs, specifications, concepts, domain theories, schedules). There is broad interest in reusing these constructs in similar problem-solving situations so as to avoid expensive re-derivation. Adaptation techniques have been developed to support reuse in frameworks such as analogical problem solving, case-based reasoning, problem reformulation, or representation change and task domains such as creativity, design, planning, program transformation or software reuse, schedule revision, and theory revision.

However, many open issues remain, and progress on such issues as case adaptation would substantially assist many researchers and practitioners. Our goals are to characterize the approaches to adaptation employed in various AI subfields, define the core issues in adaptation of knowledge, and advance the state-of-the-art in addressing these issues. We intend that presentations will investigate novel solutions to unsolved problems on adaptation, reflect diverse viewpoints, and focus on adaptation issues that are common to several subfields of AI. Discussions will be held on the strengths and limitations of adaptation techniques and their interrelationships.

Invited talks will be given by experts who will discuss methods for the adaptation of various types of knowledge constructs. Two panels will be held. First, researchers studying knowledge adaptation from different perspectives will discuss how

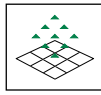
approaches used in their community differ from those used elsewhere, focusing on their potential benefits for other problems. Panelists in the second panel will lead discussions on identifying the core issues in knowledge adaptation raised in the presentations and the impact of the proposed methods on addressing these issues.

### Submission Information

Anyone interested in presenting relevant material is invited to email PostScript submissions to [aha@aic.nrl.navy.mil](mailto:aha@aic.nrl.navy.mil) using the six-page AAAI-94 proceedings format. Anyone interested in attending is asked to submit a two-page research statement and a list of relevant publications. Please see <http://www.aic.nrl.navy.mil/~aha/aaai95-fss/home.html> for further information.

### Organizing Committee

David W. Aha (cochair), NRL, [aha@aic.nrl.navy.mil](mailto:aha@aic.nrl.navy.mil); Brian Falkenhainer, Xerox; Eric K. Jones, Victoria University; Subbarao Kambhampati, Arizona State University; David Leake, Indiana University; Ashwin Ram (cochair), Georgia Institute of Technology, [ashwin@cc.gatech.edu](mailto:ashwin@cc.gatech.edu).



## AI Applications in Knowledge Navigation and Retrieval

The diversity and volume of accessible on-line data is increasing dramatically. As a result, existing tools for searching and browsing information are becoming less effective. The increasing use of non-text data such as images, audio and video has amplified this trend.

Knowledge navigation systems are knowledge-based interfaces to information resources. They allow users to investigate the contents of complex and diverse sources of data in a natural manner. For example, intelligent browsers that can help direct a user through a large multi-dimensional information space, agents that users can direct to perform information finding tasks, or knowledge-based intermediaries that employ retrieval strategies to gather information relevant to a user's request.

The purpose of this symposium is to examine the state of the art in knowledge navigation by examining existing applications and by discussing new techniques and research directions. We encourage two types of submissions: work-in-progress papers that point towards the future of this research area, and demonstrations of knowledge navigation systems. Some research issues of interest:

- **Indexing:** What indexing methods are appropriate and feasible for knowledge navigation systems? How can indices be extracted from data?
- **Retrieval:** What retrieval methods are appropriate for knowledge navigation? What retrieval strategies can be employed?
- **Learning:** How can knowledge navigation systems adapt to a changing

knowledge environment and to user needs?

- **User interfaces:** What are the characteristics of a useful navigational interface? What roles can or should an "agent" metaphor play in such interfaces? How can a navigation system orient the user in the information space?
- **Multi-source integration:** How can multiple data and knowledge sources be integrated to address users' needs?
- **Multimedia:** What are the challenges presented by multimedia information sources?

### Submission Information

The symposium will consist of invited talks, presentations, and hands-on demonstration/discussion sessions. Interested participants should submit a short paper (8 pages maximum) addressing a research issue in knowledge navigation or describing a knowledge navigation system that can be made available for hands-on demonstration at the symposium. System descriptions should clearly indicate the novel and interesting features of the system to be presented and its applicability to the central problems in knowledge navigation. Those wishing to demonstrate should also include a one-page description of their hardware and connectivity requirements. Send, by email, either a URL pointing to a PostScript version of the paper or the PostScript copy itself to aiakn@cs.uchicago.edu. Or, send 5 hard copies to Robin Burke, AI Applications in Knowledge Navigation, University of Chicago, Department of Computer Science, 1100 E. 58th St. Chicago, IL

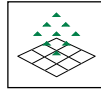
60637. For further information, a web page for this symposium is located at <http://www-cs.uchicago.edu/~burke/aiakn.html>

#### Organizing Committee

Robin Burke (chair), University of Chicago, [burke@cs.uchicago.edu](mailto:burke@cs.uchicago.edu); Catharine Baudin, NASA Ames; Su-Shing Chen, National Science Foundation; Kristian Hammond, University of Chicago; Christopher Owens, Bolt, Beranek & Newman.

#### Program Committee

Ray Bariess, Institute for the Learning Sciences; Alon Levy, AT&T Bell Laboratories; Jim Mayfield, University of Maryland, Baltimore County; Dick Osgood, Andersen Consulting.



## Computational Models for Integrating Language and Vision

**T**his symposium will focus on research issues in developing computational models for integrating language and vision. The intrinsic difficulty of both natural language processing and computer vision has discouraged researchers from attempting integration, although in some cases it may simplify individual tasks like collateral-based vision, resolving ambiguous sentences through the use of visual information.

Developing a bridge between language and vision is nontrivial, because the correspondence between words and images is not one-to-one. Much has been said about the necessity of linking language and perception for a system to exhibit intelligent behavior, but there has been relatively little work on developing computational models for this task. A natural-language understanding system should be able to understand and make references to the visual world. The use of scene-specific context (obtained from written or spoken text accompanying a scene) could greatly enhance the performance of computer vision systems.

Some topics to be addressed are:

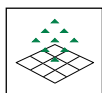
- use of collateral text in image and graphics understanding
  - generating natural-language descriptions of visual data (e.g., event perception in image sequences)
  - identifying and extracting visual information from language
  - understanding spatial language, spatial reasoning
  - knowledge representation for linguistic and visual information, hybrid (language and visual) knowledge bases
- use of visual data in disambiguating/understanding text
  - content-based retrieval from integrated text/image databases
  - language-based scene modeling (e.g., picture or graphics generation)
  - cognitive theories connecting language and perception

### Submission Information

The symposium will consist of invited talks, panel discussions, individual presentations and group discussions. Those interested in making a presentation should submit a technical paper (not to exceed 3,000 words). Other participants should submit either a position paper or a research abstract. Email submissions in postscript format are encouraged. Send to burhans@cs.buffalo.edu. Alternatively, 4 hard copies may be sent to Rohini Srihari, CEDAR/SUNY at Buffalo, UB Commons, 520 Lee Entrance Suite 202, Buffalo, NY 14228-2567. Further information on this symposium may be found at <http://www.cedar.buffalo.edu/Piction/FSS95/CFP.html>. Please address questions to Debra Burhans (burhans@cs.buffalo.edu) or Rajiv Chopra (rchopra@cs.buffalo.edu).

### Organizing Committee

Janice Glasgow, Queen's University; Ken Forbus, Northwestern University; Annette Herskovits, Wellesley College; Gordon Novak, University of Texas at Austin; Candace Sidner, Lotus Development Corporation; Jeffrey Siskind, University of Toronto; Rohini K. Srihari (chair), CEDAR, SUNY at Buffalo, rohini@cedar.buffalo.edu; Thomas M. Strat, SRI International; David Waltz, NEC Research Institute.



## Embodied Language and Action

**T**his symposium focuses on agents that can use language or similar communication, such as gesture, to facilitate extended interactions in a shared physical or simulated world. We examine how this embodiment in a shared world both stimulates communication and provides a resource for understanding it. Our focus is on the design of artificial agents, implemented in software, hardware, or as animated characters. Papers should clearly relate the technical content presented to one of the following tasks:

- Two or more communicating agents work together to construct, carry out maintenance on, or destroy a physical or simulated artifact (Collaborative Engagement)
- An agent assists a human by fetching or delivering physical or software objects. The human communicates with the agent about what is to be fetched or delivered to where. (Delivery Assistance)

We solicit papers on the following issues (not to the exclusion of others):

- Can task contexts act as resources for communication by simplifying the interpretation and production of communicative acts?
- How does physical embodiment and its concomitant resource limitation affect an agent's ability to interpret or generate language?
- Can architectures designed to support perception and action support language or other forms of communication?
- How can agents mediate between the propositional representations of language and the (often) non-

propositional representations of perception and action?

- What tradeoffs exist between the use of communication to improve the agents' task performance and the additional overhead involved in understanding and generating messages?
- Do differences between communication used to support concurrent task execution and communication used to support planning, reflect deeper differences in agent ability?
- What is the role of negotiation, whether of task responsibilities, or of reference and meaning, in such situated task environments?

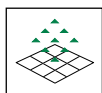
### Submission Information

Interested participants should submit either (1) a paper (in 12 pt font, not to exceed 3000 words), or (2) 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 [ian@ai.mit.edu](mailto:ian@ai.mit.edu). If electronic submission is impossible, mail 6 copies to Ian Horswill, MIT Artificial Intelligence Laboratory, 545 Technology Square, Cambridge, MA 02139.

### Organizing Committee

John Batali, UCSD; Jim Firby, University of Chicago; Ian Horswill (cochair), MIT, [ian@ai.mit.edu](mailto:ian@ai.mit.edu); Marilyn Walker (cochair), Mitsubishi Cambridge Research Labs, [walker@merl.com](mailto:walker@merl.com); Bonnie Webber, University of Pennsylvania.





## Formalizing Context

**T**he notion of context has played an important role in AI systems for many years. However, formal logical explication of contexts remains an area of research with significant open issues. This symposium will provide a forum for discussing formalizations of contexts, approaches to resolving open issues, and application areas for context formalisms.

The most ambitious goal of formalizing contexts is to make automated reasoning systems which are never permanently stuck with the concepts they use at a given time because they can always transcend the context they are in. Such a capability would allow the designer of a reasoning system to include only such phenomena as are required for the system's immediate purpose, retaining the assurance that if a broader system is required later, "lifting rules" can be devised to restate the facts from the narrow context in the broader context with qualifications added as necessary. A formal theory of context in which sentences are always considered as asserted within a context could provide a basis for such transcendence.

Formal theories of context are also needed to provide a representation of the context associated with a particular circumstance, e.g. the context of a conversation in which terms have particular meanings that they wouldn't have in the language in general. Linguists and philosophers have already studied similar notions of context. An example is the situation theory that has been proposed in philosophy and applied to linguistics. However, these theories usually lie

embedded in the analysis of specific linguistic constructions, so locating the exact match with AI concerns is itself a research challenge.

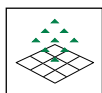
This symposium aims to bring together researchers who have studied or applied contexts in AI or related fields. Technical papers dealing with formalizations of context, the problem of generality, and use of context in common sense reasoning are especially welcome. However, survey papers which focus on contexts from other points of view, such as philosophy, linguistics, or natural language processing, or which apply contexts in other areas of AI, are also encouraged.

### Submission Information

Persons wishing to make presentations should submit papers (up to 12 pages, 12 pt font). Persons wishing only to attend should submit a 1-2 page research summary including a list of relevant publications. A PostScript file or 8 paper copies should be sent to the program chair, Sasa Buvac, Department of Computer Science, Stanford University, Stanford CA 94305-2140, [buvac@sail.stanford.edu](mailto:buvac@sail.stanford.edu). Limited funding will be available to support student travel.

### Organizing Committee

Sasa Buvac (chair), Stanford University, [buvac@sail.stanford.edu](mailto:buvac@sail.stanford.edu); Richard Fikes, Stanford University; Ramanathan Guha, MCC; Pat Hayes, Beckman Institute; John McCarthy, Stanford University; Murray Shanahan, Imperial College; Robert Stalnaker, MIT; Johan van Benthem, University of Amsterdam.



## Genetic Programming

**G**enetic programming (GP) extends the genetic algorithm to the domain of computer programs. In genetic programming, populations of programs are genetically bred to solve problems. Genetic programming can solve problems of system identification, classification, control, robotics, optimization, game-playing, and pattern recognition.

Starting with a primordial ooze of hundreds or thousands of randomly created programs composed of functions and terminals appropriate to the problem, the population is progressively evolved over a series of generations by applying the operations of Darwinian fitness proportionate reproduction and crossover (sexual recombination).

Topics of interest for the symposium include:

- The theoretical basis of genetic programming
- Applications of genetic programming
- Rigorousness of validation techniques
- Hierarchical decomposition, e.g. automatically defined functions
- Competitive coevolution
- Automatic parameter tuning
- Representation issues
- Genetic operators
- Establishing standard benchmark problems
- Parallelization techniques
- Innovative variations

### Submission Information

The format of the symposium will encourage interaction and discussion, but will also include formal

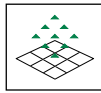
presentations. Persons wishing to make a presentation should submit an extended abstract of up to 2500 words of their work in progress or completed work. For accepted abstracts, full papers will be due at a date closer to the symposium.

Persons not wishing to make a presentation are asked to submit a one-page description of their research interests since there may be limited room for participation.

Submit your abstract or one-page description as plain text electronically by Friday April 14, 1995, with a hard-copy backup to Eric V. Siegel, AAAI GP Symposium Cochair, Columbia University Department of Computer Science, 500 W 120th Street, New York, NY 10027, USA; telephone 212-939-7112, fax 212-666-0140, e-mail [evs@cs.columbia.edu](mailto:evs@cs.columbia.edu).

### Organizing Committee

Robert Collins, USAnimation, Inc.; Frederic Gruau, Stanford University; John R. Koza (co-chair), Stanford University, [koza@cs.stanford.edu](mailto:koza@cs.stanford.edu); Robert Collins, USAnimation, Inc.; Conor Ryan, University College Cork; Eric V. Siegel (co-chair), Columbia University, [evs@cs.columbia.edu](mailto:evs@cs.columbia.edu); Andy Singleton, Creation Mechanics, Inc.; Astro Teller, Carnegie-Mellon University.



## Rational Agency: Concepts, Theories, Models, and Applications

**T**his symposium explores conceptions of rational agency and their implications for theory, research, and practice. The view that intelligent systems are, or ought to be, rational agents underlies much of the theory and research in artificial intelligence and cognitive science. However, no consensus exists on a proper view of agency or rationality principles for practical agents.

Traditionally agents are presumed disposed toward purposive action. However, agent theories abound in which behavior is fundamentally reactive. Some theories emphasize agents' abilities to manage private belief systems. Others focus on agents' interactions with their environment, sometimes including other agents. Application builders have recently broadened the term "agent" to mean any embedded system performing tasks to support human users.

Rationality accounts are equally diverse. Rationality involves having reasons warranting particular beliefs (epistemic rationality) or particular desires and actions (strategic or practical rationality). Many agent models propose epistemic rationality criteria such as logical consistency or consequential closure. Other agent models base practical rationality on classical or non-monotonic logics for reasoning about action. Such logicist views are now being challenged by decision theoretic accounts emphasizing optimal action under uncertainty, including recent work on decision theoretic principles of metareasoning for limited rationality.

Our symposium will explore the diverse views of rational agency.

Through informal presentations and group discussion, participants will critically examine agency concepts and rationality principles, review computational agent models and applications, and consider promising directions for future work on this topic.

### Submission Information

Prospective participants should submit a brief paper (5 pages or less) describing their research in relation to any of the following questions:

- Is rationality important; must an agent be rational to be successful?
- What are suitable principles of epistemic, strategic, and limited rationality?
- Are rationality principles applicable to retrospective processes such as learning?
- What are general requirements on rational agent architectures?
- How, if at all, must a model of rational agency be modified to account for social, multi-agent interaction?

Those wishing to make a specific presentation should describe its contents in their concept paper. *Note:* While we recognize that our topic lends itself to formal analysis, we also encourage discussion of experimental work with implemented agents. Postscript files of concept papers should be sent by email only to the program chair, [fehling@lis.stanford.edu](mailto:fehling@lis.stanford.edu).

### Organizing Committee

Michael Fehling (chair), Stanford University, [fehling@lis.stanford.edu](mailto:fehling@lis.stanford.edu); Don Perlis, University of Maryland; Martha Pollack, University of Pittsburgh; John Pollock, University of Arizona.