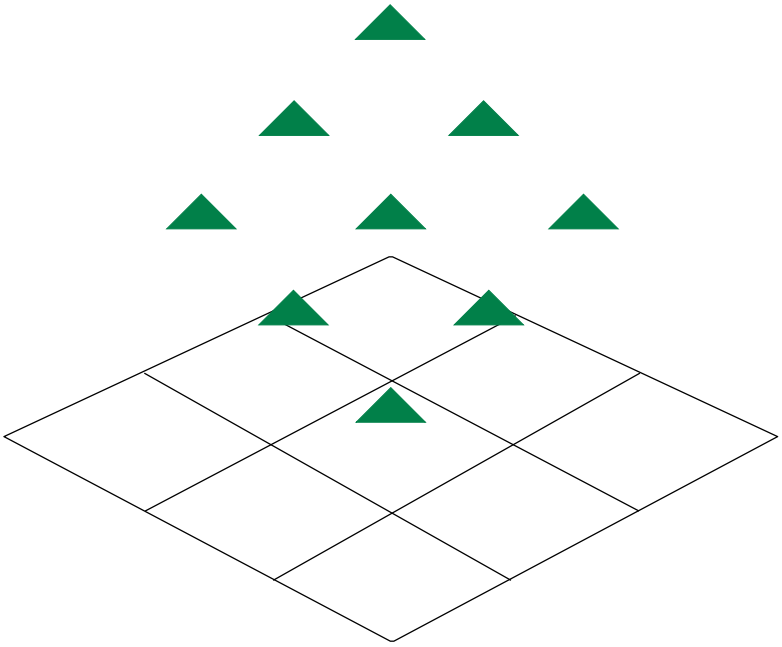


AAAI 1994

Spring Symposium Series

March 21 – 23, 1994
Stanford University, California
(Special Symposium, March 19-20)

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 1994 Spring Symposium Series, to be held Monday through Wednesday, March 21–23 at Stanford University, Stanford, California.

The topics of the ten symposia in the 1994 Spring Symposium Series are:

- Active NLP: Natural Language Understanding in Integrated Systems
- Applications of Computer Vision in Medical Image Processing
- Artificial Intelligence in Medicine: Interpreting Clinical Data
- Computational Organization Design
- Decision-Theoretic Planning
- Detecting and Resolving Errors in Manufacturing Systems
- Goal-Driven Learning
- Intelligent Multi-Media Multi-Modal Systems
- Software Agents
- Toward Physical Interaction and Manipulation

In addition, an eleventh symposium will be held the preceding weekend (19 – 20 March) at the same location:

- Believable Agents

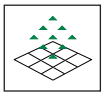
Symposia will be limited to between forty and sixty participants. Each participant will be expected to attend a single symposium. Working notes will be prepared and distributed to participants in each symposium.

A general plenary session, in which the highlights of each symposium will be presented, will be held on March 22, and an informal reception will be held on March 21.

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 December 1993. 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 15th, 1993. Notification of acceptance will be given by November 15th, 1993. Material to be included in the working notes of the symposium must be received by January 31, 1994. See the appropriate section below for specific submission requirements for each symposium.



Believable Agents

Please note: The symposium on Believable Agents will be held the weekend preceding the remainder of the symposia. **Participation in this symposium does not preclude attendance at one of the others.**

AI has long sought to construct autonomous creatures. The thought of these entities brings special delight when they are imagined to project a sense of being "really there" — aware, intentioned, and capable of significant social interaction. Through an analogy presented below, let us call these "believable agents."

Many research groups are now trying to build "complete" agents. Much of this work occurs under the themes of situated agents and integrated architectures, but relevant work occurs across varied subareas such as intention, emotion, and discourse.

As computational technology for "complete" agents has developed, demand for believable agents has increased in such domains as user interfaces and interactive entertainment. Meeting this apparently difficult demand might not require accurate modeling of human cognitive processes. It might not be necessary to build especially intelligent or competent agents, measured in some objective sense. The actual requirement is to achieve a persistent appearance of awareness, intention, and social interaction.

The arts (film, theater, novels, radio, drama) have long studied a related problem. Here the agents are called "characters," and the requirement that the characters project the image of being really there is called "permitting suspension of disbelief." Artists, (such as traditional animators), know much about how to achieve this using highly simplified agents (simple body, simple mind, simple environment, e.g., Elmer Fudd). They know what abstractions can be made safely, and which facets of appearance and behavior are crucial to maintain. We believe these artists can convey significant useful knowledge to AI researchers trying to construct believable interactive creatures.

The goal of the proposed symposium is to bring together researchers interested in exploring the idea of "believability" from an AI point of view, including a selected set of artists who can shed light on traditional notions of, and techniques for, establishing suspension of disbelief. We feel this is a fresh way of looking at the task of building agents, and that clarifying the nature of this task will yield interesting new research problems and useful new artifacts.

Among the questions we hope to discuss are: What makes characters believable? What makes agents believable? Are agents different from characters? What is the nature of current integrated architectures and situated agents? How well do they support believability? Are there clear areas demanding study? How much breadth of capability is necessary to produce a believable agent? How much depth (competence) is necessary? What are the respective roles of movement and language in achieving believability? What is the role of context in establishing expectations

in the user and thus in simplifying the task? For instance, how can the setting of an interface agent or the theme of a story help limit the technical requirements on agents? How can we measure believability and progress toward believability? Why don't artists use "scientifically valid" techniques to evaluate the believability of their characters?

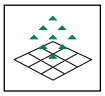
Prospective participants should submit a short summary of their relevant research and/or artistic activities (two-three pages) that emphasizes the fundamental goals of the work, the status of the efforts, and especially its relevance to the construction of believable agents. Be sure to include a mailing address, telephone number, fax number, and email address.

The organizing committee will consider the submissions and invite selected participants to present material at the symposium.

Electronic submissions are preferred, but these must be plain, unformatted text. If this is impossible, then send hard copy. In either case, please send one copy to:

joseph.bates@cs.cmu.edu or
Joseph Bates
School of Computer Science
Carnegie Mellon University
5000 Forbes Avenue
Pittsburgh, PA 15213

Organizing Committee: Joseph Bates (chair), Carnegie Mellon University; Barbara Hayes-Roth, Stanford University; Brenda Laurel, Interval Research Corporation; Nils Nilsson, Stanford University.



Active NLP: Natural Language Understanding in Integrated Systems

This symposium is designed to address issues raised by the interaction or integration of natural language understanding with other cognitive tasks. In particular, this symposium is designed to focus on integrated systems whose main task is not extracting information from text, and to examine the function and implementation of natural language understanding in such systems. In particular, one of the overall objectives of the symposium is to examine what it means to "understand" natural language in the context of integrated systems with non-linguistic goals.

In general, the symposium is interested in addressing two questions: how does natural language understanding inform or constrain the achievement of other cognitive tasks, and how do processes aimed at achieving other cognitive tasks inform or constrain a theory of natural language understanding? Additional questions of interest to this symposium include but are not limited to the following:

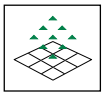
- Is knowledge used in other cognitive tasks accessible or inaccessible to language understanding processes? What constraints and limitations does this pose for the system as a whole?
- How does the behavior of the overall system affect the natural language understanding process? What aspects of the task can feed back into language, and when?
- Can the system learn through natural language understanding? How does knowledge acquired through language come to be accessible to task processes? How does this learning improve the overall system's performance?
- What is the appropriate level of interruptability and interleavability in language and task subprocesses?

No specific approach to natural language understanding or other cognitive tasks is presumed; indeed, we wish to leave the definition of natural language understanding quite open. Papers should focus on issues of interaction or integration rather than the tasks themselves. Of particular interest are papers that address interaction or integration in the context of an implemented system. Papers submitted to the symposium should describe the overall task of the system, point out in what respect natural language understanding ability is useful to such a system, and explain how the natural language understanding process is influenced by the overall system. To be of maximum benefit to the symposium, papers should strive to be technical and implementation-oriented.

Those interested in presenting (not all accepted papers will be presented) should submit five pages in the AAAI format. Those interested in attending (only) may submit one page on research interests in the AAAI format. Four copies of each paper in hardcopy must be sent to:

Charles Martin
Department of Computer Science
The University of Chicago
1100 East 58th Street
Chicago, IL 60637

Organizing Committee: Charles Martin, (chair), University of Chicago, (martin@cs.uchicago.edu); Jill Fain Lehman, Carnegie Mellon University; Kurt Eiselt, Georgia Institute of Technology; Marcel Schoppers, Stanford University).



Applications of Computer Vision in Medical Image Processing Description

Significant interest and activity in medical image processing has developed among computer vision researchers in the last several years. This interdisciplinary activity is still in a relatively early stage of development, in terms of applied technology and the size of the research efforts.

This symposium is intended to serve several purposes:

- To bring together vision and robotics researchers who are currently applying computer vision to medical image processing problems.
- To increase communication between established researchers in medical image processing and computer vision researchers.
- To provide information to researchers who are interested in the field.

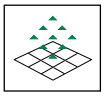
Most of the conference will be devoted to paper presentations and informal presentations of works in progress, interspersed with various forms of discussion. Working notes will be and distributed to the participants.

Specific areas of interest include (but are not limited to) image guided medical procedures/robotics; image processing applied to laparoscopic and other endoscopic procedures; change detection in medical images; recognition in medical images; multimodal registration of medical images; inelastic registration of medical images; motion analysis in medical images; anatomical atlases; applications of computer vision in segmentation of medical imagery

If you are interested in attending the symposium, please submit an abstract of a paper to be presented, a description of research in progress, or a statement describing what you hope to contribute to and gain from the symposium to:

William M. Wells III (chair)
Harvard Medical School
Brigham and Women's Hospital
Department of Radiology
75 Francis St.
Boston, MA 02115
(617) 278-0622 sw@ai.mit.edu

Organizing Committee: William M. Wells III (chair), Harvard Medical School, (sw@ai.mit.edu); Eric Grimson, Massachusetts Institute of Technology; Ron Kikinis, Harvard Medical School; Takeo Kanade, Carnegie Mellon University; Nicholas Ayache, INRIA.



Artificial Intelligence in Medicine: Interpreting Clinical Data

The deployment of on-line clinical databases, many supplanting the traditional role of the paper patient chart, has increased rapidly over the past decade. The consequent explosion in the quality and volume of available clinical data, along with an ever more stringent medicolegal obligation to remain aware of all implications of these data, has created a substantial burden for the clinician. The challenge of providing intelligent tools to help clinicians monitor patient clinical courses, forecast likely prognoses, and discover new relational knowledge, is at least as large as that generated by the knowledge explosion which motivated earlier efforts in artificial intelligence in medicine (AIM). Whereas many of the pioneering programs worked on small data sets, which were entered interactively by knowledge engineers or clinicians, the current generation of programs have to act on raw data, unfiltered and unmediated by human beings. Interaction with human users typically only occurs on demand or on detection of clinically significant events. This symposium will emphasize methodologies that provide robust autonomous performance in data-rich clinical environments ranging from busy outpatient practices to operating rooms and intensive care units. Relevant topics include intelligent alarming (including anticipation and prevention of adverse clinical events), data abstraction, sensor validation, preliminary event classification, therapy advice, critiquing, and assistance in the establishment and execution of clinical treatment protocols. Detection of temporal and geographical patterns of disease manifestations and machine learning of clinical patterns are also of interest.

A large data sample will be made available to participants to serve as training and test sets for various approaches to information management and to provide a common domain of discourse.

The sample will consist of two data sets: A dense, high volume data set typical of a critical care environment. This data set will consist of hemodynamic measurements, mechanical ventilator settings, laboratory values including arterial blood gas measurements, and treatment information covering a twelve-hour period of a patient with severe respiratory distress. Monitored parameters (ten to fifteen channels of data) will be sampled and recorded at rates up to 1/10 Hz. The data set will be annotated with other clinically relevant data, physician's interpretations, and established diagnoses.

A large number of sparse data sets representative of outpatient clinics. The data will include laboratory measurements, treatment information, and physical findings on a large sample of patients (fifty to one hundred patients) taken from the same disorder population. Each patient record will consist of several years worth of clinical information sampled at irregular intervals. A large percentage of the cases will be made available to interested researchers to be used as training cases. For interested parties, a small percentage of cases will be made available to participants two weeks prior to the symposium to be

used as an optional testing set for various approaches.

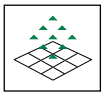
The data samples and accompanying clinical information will be available via ftp or email server around August 15, 1993. Please contact the organizing committee at the addresses below for further information. The data will also be made available on diskettes to participants who do not have Internet access. It will be left to the discretion of the participants to use any subset of these samples to help focus their approaches and presentations. The data can also be used as test vehicles for their own research and to create sample programs for demonstration at the symposium. Participants do not have to use the data in order to participate. However, the program committee will favor presentations which exploit the provided data sets in their analyses.

Potential participants are invited to submit abstracts no longer than two pages (less than 1,200 words) outlining methodology and indicating, if applicable, how the data sets may be used as proofs-of-principle for the proposed methodology. Authors of accepted abstracts will be asked to submit a working paper for the working notes. They will also be asked to prepare either a poster or an oral presentation.

Electronic submissions are encouraged. The abstracts may be sent to aim-94@camis.stanford.edu in either ASCII or PostScript formats. Submissions may by sent by mail only if you cannot submit an abstract electronically. For further information, please contact the cochairs at the address below or by email at aim-94@camis.stanford.edu. Fax submissions will not be accepted. Send six copies of the abstract to:

Serdar Uckun, MD, AIM-94
Knowledge Systems Laboratory
Stanford University
701 Welch Road, Bldg. C
Palo Alto, CA 94304
Phone: (415) 723-1915

Organizing Committee: Serdar Uckun, (cochair), Stanford University; Isaac Kohane, (cochair), Harvard Medical School; Mario Stefanelli, Universita di Pavia; Ramesh Patil, USC/Information Sciences Institute; Enrico Coiera, Hewlett-Packard Laboratories/Bristol.



Computational Organization Design

Modern private and public organizations are facing immense pressures to rapidly reconfigure their processes, products, and relationships with other organizations. The cross-functional complexity of these changes—including their impacts on the technologies that organizations use, the structures of organizations, and the integration of human and cognitive issues such as skill requirements, cognitive loads, and performance management systems—is immense. AI has found numerous applications in supporting decision-making in organizations, but few in managing the complex issues of organizational design, analysis, reconfiguration, reengineering, and process change. The problem of capturing and managing this complexity cries out for computational design/analysis support, much in the way that other large, complex design and analysis problems (e.g., architectural design, engineering design) have been supported by automated assistance.

At the same time, organization theories and design approaches have reached a degree of maturity that they can profitably be brought together in the new enterprise of supporting the reconfiguration of organizations. This new avenue, which we call computational organization design (COD), encompasses both the theoretical, practical, and methodological aspects of AI, design, and organization theory. The scope of computational organization design encompasses both the design of human organizations, the design of automated organizations such as intelligent networks, and the design of highly-integrated human-technology organizations in which there is an integrated division of labor between people and computing.

COD is an important research area and an interesting and promising class of abstract design problems. Key research questions include:

- How can design process models (DPMs) for organizational design be characterized, identified and verified? A DPM is an explicit model of the activities carried out while creating a design. Adopting a particular DPM amounts to making the hypothesis that, over a collection of design problems, applying the DPM will generate a useful percentage of highly-evaluated acceptable designs with acceptable levels of effort.
- Can AI, with its unique capabilities for rigorous, qualitative inference, provide powerful new capabilities to formalize and execute organization theory? For example, most organization theory to date makes only qualitative predictions about aggregate behaviors of organizations, treating environmental constraints and contingencies like point loads at the center of mass of the organization.
- How can COD contribute in practical arenas such as business process reengineering and redesign?
- To what extent can organization design be treated as a routine design problem, with a well defined space of possibilities and explicit evaluation criteria?
- Are there any important implications of the fact that organizations are abstract objects, subject to con-

straints of a different nature from the constraints that physical objects are subject to?

- How should a DPM for COD differ from DPMs for other applications?
- What role does creative design play in COD?

Other questions are: what is the state of the art of computational organization design? What should the agenda for future research be?

The goal of this symposium is to bring together researchers from the fields of AI, design and organization theory in order to define and build a community of researchers active in computational organization design. The format of the symposium will be designed with the aim to support this goal and will include selected presentations and extensive, but closely moderated, discussions.

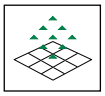
Anybody who wishes to participate and make a presentation should submit an extended abstract (500-1000 words) of the presentation. The character of presentations may vary widely and include: complete results, experimental data, report on work in progress, theoretical analysis and thoughtful speculations. Other prospective participants should submit a statement (approximately 500 words) explaining their interests and experiences related to COD and what they can contribute to the discussions. Please include references to all your publications related to COD in your submission. The number of participants is limited and invitations will be made based on a review of the submissions.

Submissions may be included in working notes distributed to the participants, for discussion purposes only. No other distribution of submissions will be made by the organizing committee or AAAI, without written permission of the authors.

Email submissions are preferred (ASCII or LaTeX); otherwise submit four hardcopies, or (as a last resort) fax one copy to:

Ingemar Hulthage
Institute of Safety and
Systems Management
University of Southern California
Los Angeles, CA 90089-0021
(213) 740-4044 (voice)
(213) 740-9732 (fax)
hulthage@usc.edu (email)

Organizing Committee: Ingemar Hulthage, (chair), University of Southern California, hulthage@usc.edu; Raymond E. Levitt, Stanford University; Duvvuru Sriram, MIT; Sarosh Talukdar, Carnegie-Mellon University.



Decision-Theoretic Planning

Both AI planning and decision theory are devoted to the problem of how an agent chooses a good course of action, based on information about the world and about the agent's capabilities and preferences.

The AI community has concentrated on the task of synthesis: given a description of a situation, schematic descriptions of actions with methods for composing them, and some objectives, generate a course of action that furthers those objectives. Classical planning algorithms have for the most part assumed that the agent has perfect information about and control over the world, and that the objectives are described by a symbolic goal state that either is or is not satisfied.

These simplifying assumptions conspire to make it difficult to reason about tradeoffs in the planning process, in particular tradeoffs involving the relative likelihood and desirability of possible plan outcomes. Under the classical assumptions, both plan success and plan quality are all-or-nothing propositions.

Decision theory provides a language for expressing richer notions of success and quality, along with a normative criterion for making tradeoffs among plans achieving the objectives with varying degrees and likelihoods. Decision theory lacks a computational model of how to generate those plans in the first place, however, and thus does not address the synthesis task.

This symposium aims to unify current lines of research in the AI planning community with research in related disciplines—decision analysis, economics, and control theory—by exploring how the richer constructs offered by the decision-theoretic methodology for describing preference and uncertainty can be applied to the problem of plan synthesis. Although AI and decision theory have sometimes been viewed as competing approaches, a growing number of researchers have begun to appreciate their complementary character, and are starting to address the challenge of integrating these ideas.

We invite contributions pertaining to all aspects of decision-theoretic planning, particularly those making substantive connections between the two fields. Topics will include, but are not limited to:

- Representing and reasoning about preferences. How can AI planning's notion of goals be extended to richer utility models? How do we represent concepts such as partial goal satisfaction, the cost of consuming resources, multiple objectives, and so on?
- Uncertain effects of actions. How can causal or action models be extended to take into account uncertainty about the state of the world, the effects of actions, and exogenous events? How do we represent information-gathering actions (e.g. active sensing), and cope with the complexity of conditional planning?
- Model construction. How can representations and techniques from the decision sciences and other disciplines—e.g., graphical decision models such as influence diagrams and

solution techniques such as policy iteration—be applied to the problem of plan generation? In particular, how can we exploit these technologies without unduly restricting the expressiveness of our representation for actions and their effects?

- Specialized problems and representations. For example, what is the relationship between decision-theoretic techniques for path- and motion-planning problems that generally describe their state spaces and operators numerically and the problems involving symbolic state spaces and operators more typically addressed by AI planning research?
- Decision-theoretic meta-level reasoning. How can decision-theoretic criteria be applied to the problem of controlling the reasoning of an agent so that it behaves rationally without (necessarily) using decision-theoretic calculations to make its decisions? Possible techniques include the use of decision theory to control the plan-generation process itself, and using the methodology to precompile rational behaviors.

Various groups in AI, in the decision sciences, in control theory, and in economics have been pursuing research efforts using the concepts and techniques underlying decision-theoretic planning. The efforts have varied in the issues they consider important and in the simplifying assumptions they make. This symposium will provide a forum for exploring these differences, with the aim of distinguishing the fundamental barriers from those merely cultural or terminological. By cross-fertilizing the ideas from several decision disciplines (of which AI planning is one), we will ultimately arrive at a better understanding of the common enterprise.

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

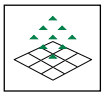
- Technical contributions describing progress or addressing issues in decision-theoretic planning. We welcome abstracts reporting on work in progress.
- Position papers describing viewpoints on the enterprise of decision-theoretic planning, or advocating particular approaches.

Those wishing to attend but not applying to participate in the symposium's technical or panel presentations should submit a one to two page statement of interest indicating the submitter's particular interest in the symposium's topic, specifically addressing how his or her research or experience attacks the problem of reconciling the decision-theoretic and AI planning approaches to problem solving (or would benefit from such a reconciliation).

We strongly encourage electronic submissions. Send submissions and questions to dtp-symposium@cs.washington.edu. Send paper submissions to:

Steve Hanks
Department of Computer Science & Engineering
Room 114, Sieg Hall
University of Washington, FR-35
Seattle, WA 98195
206/543-4784

Organizing Committee: Steve Hanks, (chair), University of Washington, hanks@cs.washington.edu; Stuart Russell, University of California, Berkeley; Michael P. Wellman, University of Michigan.



Detecting and Resolving Errors In Manufacturing Systems

This symposium will bring together researchers working on troubleshooting, diagnosis, monitoring, and recovery from errors in manufacturing applications. The main purpose is to bring together people from manufacturing with people from AI to discuss how AI techniques and methodologies can be used to address the problems of detecting and resolving errors. The symposium will provide a forum for reviewing the state of the art and for proposing new avenues of exploration.

Any system designed to perform a manufacturing task must have ways of detecting and recovering from errors. Timely detection of anomalies in the behavior of the system is essential for its continuous safe operation. This involves preventing or minimizing the occurrence of faults through robust design, detecting abnormal conditions, isolating faults, and finding ways of maintaining safe operation despite the presence of faults. The manufacturing environment is often sufficiently uncertain and dynamic, and the manufacturing systems are sufficiently complex to make detection and recovery from errors a major task. The purpose of this symposium is to analyze these issues and propose how to create manufacturing systems able to achieve their tasks despite unpredicted contingencies.

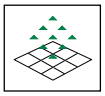
Area of interest include (but are not limited to): reliability technology (reliability analysis, fault trees, event trees, etc); monitoring (model-based monitoring, fault-model based monitoring, detection of trends and prediction of anomalies, etc); error detection (sensor modeling, recognition of abnormal conditions, sensor interpretation, etc); error analysis (explanation of failures, causal modeling, troubleshooting techniques, etc); planning (sensor planning, repairing plans that fail, generation of recovery procedures, etc); scheduling (generating robust schedules, detecting and recovering from schedule execution errors, etc).

Papers addressing these and related issues in the area of manufacturing will be considered. Work in progress, innovative ideas, field based studies, experimental results in real manufacturing environments, and completed projects will be of interest. Both practical and theoretical work is welcome, but preference will be given to descriptions of implemented systems. The best papers will be consider for a special issue of a journal and/or a book on this subject.

Those interested in attending should submit an abstract or short position paper, three pages maximum. Please submit three copies (hardcopy submissions only!) to:

Maria Gini (chair)
4-192 EE/CSci Building
200 Union St SE
Minneapolis, MN 55455
(612) 625-5582 gini@cs.umn.edu

Organizing Committee: Robert D. Borchelt, University of Wisconsin-Milwaukee; Frank DiCesare, Rensselaer Polytechnic Institute; Bruce Donald, Cornell University; Mark Drummond, NASA Ames Research Center; Maria Gini, (chair), University of Minnesota, gini@cs.umn.edu; Damian Lyons, Philips Laboratories.



Goal-Driven Learning

Goal-driven learning refers to the process of using the overall goals of an intelligent system to make decisions about when learning should occur, what should be learned, and which learning strategies are appropriate in a given context. This focusing process may take place at any decision point during learning—for example, when determining what to learn, selecting a bias, pruning the space of theories to be considered, or generating experiments for data gathering. Research in psychology, education, and AI has shown the need for intelligent systems to make decisions about what and how to learn. The common rationale, and the principle around which the symposium will be organized, is that the value of learning depends on how well it satisfies the goals of the system. The symposium will bring together researchers from diverse research areas to discuss issues in how learning goals arise, how they affect learner decisions of when and what to learn, and how they guide the learning process.

Topics addressed by the symposium will span the diverse work in this area, which includes research in formulating learning goals, experiment generation, utility of knowledge assessment, evaluating and selecting learning biases, explanation-based learning, learning from texts, active learning, case-based reasoning, formal analyses of decision making, automated question generation, knowledge acquisition planning, reinforcement learning, and control theory. We encourage researchers from fields other than these to submit papers on related research.

In addition to technical presentations, the symposium will include a session of invited talks on relevant topics, such as formal utility analyses of learning, automated experiment planning, psychological evidence for goal-driven learning behavior in humans, human educational motivation, and question generation. Depending on the number and quality of submitted papers, we may include a poster session as well. If there is sufficient overlap, we will arrange a joint session with the symposium on Decision-Theoretic Planning.

Time will be set aside for debate and discussion during the technical sessions, and the symposium will conclude with a panel and audience discussion of the issues raised during the symposium. Members of the concluding panel will be selected during the meeting, with the intention of creating a panel representative of the viewpoints expressed at the symposium.

In order to stimulate debate and discussion on future directions for research as well as evaluation of existing approaches to goal-driven learning, we encourage the submission of extended abstracts describing work in progress, position papers, and papers describing innovative unexplored approaches, as well as papers describing mature research results.

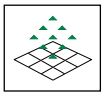
Shorter submissions (under five pages) are encouraged; however, longer submissions (up to ten pages) will be accepted. If you wish only to participate in the workshop, please submit two hardcopies of a research summary describing your relevant

research interests. Questions may be directed to Ashwin Ram (ashwin@cc.gatech.edu) or to Marie desJardins (marie@erg.sri.com).

If you wish to present a paper, please submit four hardcopies of a paper or extended abstract to:

Ashwin Ram
College of Computing
Georgia Institute of Technology
Atlanta, GA 30332-0280
(404) 853-9372

Organizing Committee: Marie desJardins (cochair), Lawrence Hunter, Foster John Provost, Ashwin Ram (cochair).



Intelligent Multi-Media Multi-Modal Systems

This symposium will deal with AI and HCI problems that arise in developing advanced forms of input and output for multi-media, multi-modal (M4) systems. It is intended to bring together researchers in computer vision; natural language processing; generation, input, and analysis of text, speech, and graphics; location-aware technology; knowledge representation; discourse planning; human activity modelling; and human-computer interaction. The goal is to discuss how the theories and practices of AI and HCI modelling can be combined to address the design of real interactive application systems. The symposium will consider the following issues:

- Using novel input techniques, such as computer vision, to perform face recognition and gesture recognition, lip reading and eye tracking as forms of input to interactive programs, and location-aware technology to enable systems to track and find mobile users. Also of concern is how to integrate and interpret multiple inputs (e.g., text, speech, gesture, eye motion) in a common semantic representation.
- Generating coordinated text, graphics (2D, 3D, and animation), audio (speech and non-speech) as part of an interactive M4 dialogue.
- Using semantic and pragmatic discourse models to structure M4 input and output dialogues. Also of interest are the acquisition, representation, and maintenance of models of media, user, and dialogues.
- Using agent-based models to specialise the integration of interactive M4 systems.
- Facilitating direct interaction between KBSs and end users through M4 dialogues.
- Developing methodologies for measuring the success of M4 systems.

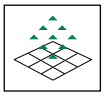
To encourage as much interaction as possible, more time will be allocated to discussing papers than to presenting them. Participants will receive papers for the symposium in advance, so they can read them prior to arrival, together with a list of points for discussion. Each session will be led by a discussant.

Submissions should be in the form of a position paper (up to six A4 pages) or a full paper (up to ten A4 pages). The symposium organisers are particularly interested in papers that cut across the boundaries of AI and HCI. Working papers and reports on ongoing research are welcome. Submissions should address one or more of the six issues described above. All submissions should include the postal and electronic mail address of each person intending to participate. Five paper copies should be sent to either:

Peter Johnson (Symposium chair)
Department of Computer Science
Queen Mary and Westfield College
University of London
Mile End Road, London, E1 4NS UK
pete@dcs.qmw.ac.uk
+44 (0)71-975-5224 *or*

Joe Marks, DEC CRL
One Kendall Sq., Bldg 700
Cambridge, MA 02139 USA
marks@crl.dec.com (617) 621-6667

Organizing Committee: Peter Johnson (chair), Univ. of London, pete@dcs.qmw.ac.uk; Steve Feiner, Columbia Univ.; Joe Marks, DEC CRL, marks@crl.dec.com; Mark Maybury, MITRE; Johanna Moore, University of Pittsburgh.



Software Agents

Software agents are sensor/effector systems that operate within real-world software environments such as operating systems, databases, or computer networks. Their sensors observe features of this external environment, and their effectors can both alter the state of the environment directly, and communicate with other agents. Software agents pursue goals such as acquiring information about the environment or modifying its state, either individually or in teams. In contrast to work on human-computer collaboration, our focus is on agents with a high degree of autonomy and flexibility.

Advances in computer, information, and telecommunications technology have made software agents both necessary and possible. However, the role of AI, and AI researchers, in these developments has yet to be determined. We believe that AI has the potential to contribute to these developments, on the one hand, and that software domains offer fascinating research challenges on the other. To capitalize on this opportunity we seek to bring together researchers in this new area, to develop a common vocabulary, and to identify the fundamental research issues that define it. Specifically, we would like to identify challenge problems for the community (e.g. email filtering); possibilities for software agent interaction (e.g. can Maes and Mitchell's meeting scheduling systems query Etzioni's UNIX softbot for information about potential meeting participants such as their phone numbers, current location, etc.); and possible connections to computer scientists outside AI (in databases, operating systems, office automation, etc.)

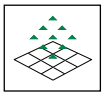
Research questions include:

- How are software agents different from standard computer programs?
- What are appropriate software agent architectures?
- What are appropriate languages for inter-agent communication?
- Is explicit representation of capabilities and states of other agents necessary for the success of software agents?
- What are appropriate "social laws" for "societies" of agents?
- What are fundamental learning problems for software agents?
- How do the notions of "planning" and "execution" in software domains compare with the classical notions?
- What mechanisms are necessary to ensure long-term agent survival?

The symposium will consist of invited talks, individual presentations, and group discussion. If you wish to present your work, please submit four copies of an extended abstract (hardcopy only, 12 pt font, at most 1,500 words). To participate, please submit a one-page research statement and bibliography. All submissions should include an email address. We encourage graduate students actively working on a project in this subfield to participate. Submissions should be addressed to:

Oren Etzioni (Spring Symposium '94)
Dept. of Computer Science &
Engineering, FR – 35
U. of Washington, Seattle, WA 98195

Organizing Committee: Oren Etzioni, (chair), Univ. of Washington; Pattie Maes, MIT; Tom Mitchell, Carnegie Mellon Univ.; Yoav Shoham, Stanford Univ.



Toward Physical Interaction and Manipulation

The range and scope of practical robotics applications depends critically on the ability of robots to physically interact with their environments. Current applications are highly specialized, and typically involve carefully controlled, well understood workspaces with little or no sensory feedback. Construction costs and inflexibility limit the economic viability of these systems. The general manipulation skills of humans and other animals contrasts starkly with the current capabilities of robots. From threading a needle, to opening a door, to catching a ball, to moving a sofa, we engage our environments in myriad ways. Unlike most current robots, we rely upon rich sources of sensory feedback to cope with uncertainties in our varied world.

The purpose of this workshop is to draw together researchers from a range of disciplines to study the principles of physical interaction and manipulation. The goal is to consider theories, paradigms, and ontologies for both natural and artificial systems, and to develop generally useful concepts, architectures, and algorithms for building and describing them.

The approach is to select in advance a set of tasks that range in difficulty and span a number of research issues. Each prospective participant is to develop conceptual designs for one or more of these tasks prior to the workshop. It is acceptable for designs to be speculative, as we encourage creative solutions. However, the aim is to examine tasks in detail and sketch complete systems. At the workshop, selected designs will be presented, discussed, and compared in an attempt to reach a more general understanding. By analyzing a range of tasks, we aim to broaden our perspective, identifying common themes and useful design principles. The rationale for this format is that participants will be well prepared for the discussions by thinking in detail about some of these tasks in advance. The list of candidate tasks include: make a cup of coffee; fry and serve an egg; prepare buttered toast; play catch; insert and play a video tape; vacuum/mop the floor or mow the lawn; dig a hole/trench; (un)lock a door with a key; open, pass through, and close a door; feed someone using a fork, knife, spoon, cup, etc.; retrieve a screwdriver from the toolbox in the garage.; fold clothes; move large objects (boxes, chairs, furniture).

These activities involve a range of skills and will most likely require a range of mechanisms. They can be characterized by their requirements for real-time dynamics; ballistic vs. servo control; timed control; position/orientation/velocity/force control; tool usage & action at a distance; multiple temporal phases; sensor modalities (e.g., visual, haptic); compliance; constraints on the workspace/environment.

Participants should attempt to characterize their tasks and designs according to these (and other) features to facilitate comparison.

Potential participants should submit a short description of their background and research interests along with designs and analyses for indi-

vidual tasks. To improve the depth and quality of the designs, participants are encouraged to work in teams, especially in collaborations that combine complementary expertise. Of course, demonstrations of working systems, including simulations and videos, are encouraged. Send submissions to either:

Steven Whitehead
GTE Laboratories Incorporated
40 Sylvan Rd.
Waltham, MA 02254
phone: (617) 466-2193
FAX: (617) 890-9320
swhitehead@gte.com
or
David Coombs
Natl Inst of Stds and Tech (NIST)
Robot Systems Division
Building 220, Room B-124
Gaithersburg, MD 20899 USA
phone: (301) 975-2865
FAX: (301) 990-9688
coombs@cme.nist.gov

Organizing Committee: Emilio Bizzi, MIT; Jon Connell, IBM Watson; David Coombs, (cochair), NIST, coombs@cme.nist.gov; Ken Goldberg, USC; Rod Grupen, University of Massachusetts; Stan Rosenschein, Teleos Research; Steven Whitehead, GTE Labs, (cochair), (swhitehead@gte.com)

COMING ATTRACTIONS

The AAAI FALL SYMPOSIUM SERIES for 1994 will be held in late October of 1994 at a location on the East Coast of the United States. The symposia to be offered will include:

- Knowledge Representation For Natural Language Processing In Implemented Systems

Chair: S. Syali, SUNY Buffalo, syali@cs.buffalo.edu

- Improving Instruction of Introductory AI

Chair: M. Hearst, UC Berkeley, marti@auspex.berkeley.edu

- Intelligent Control

Chairs: B. Kuipers, Univ. Texas, kuipers@cs.utexas.edu; L. Ungar, Univ. Pennsylvania, ungar@central.cis.upenn.edu

- Planning and Learning: On to Real Applications

Chairs: Y. Gil, ISI, gil@isi.edu; M. Veloso, CMU, veloso@cs.cmu.edu

- Relevance

Chair: R. Greiner, Siemens, greiner@learning.siemens.com

For more information, contact the chair of the 1994 Symposium Series: Lynn Andrea Stein, las@ai.mit.edu.