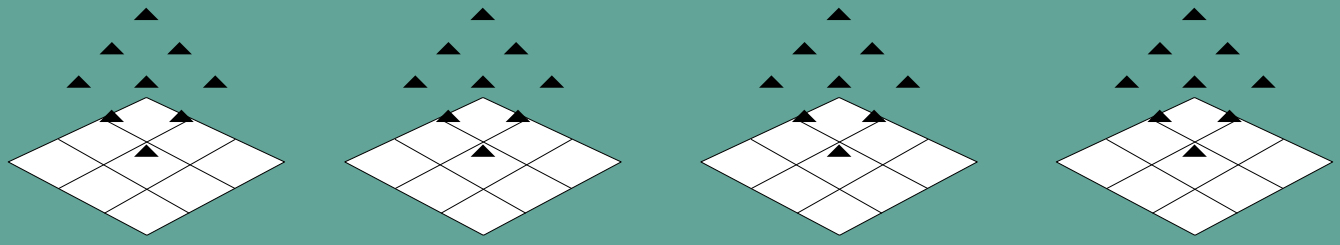
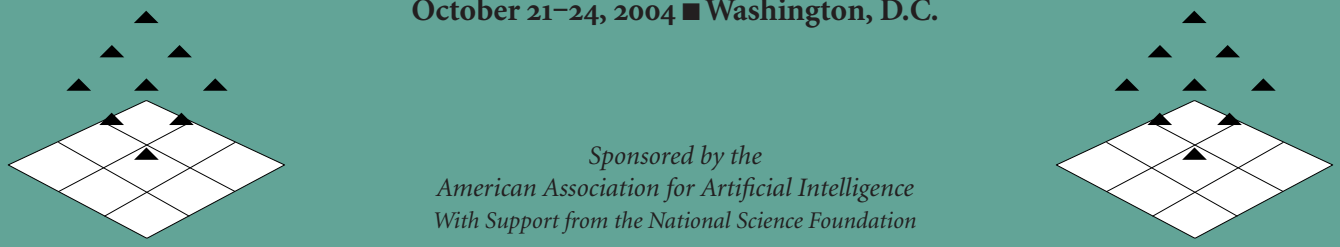


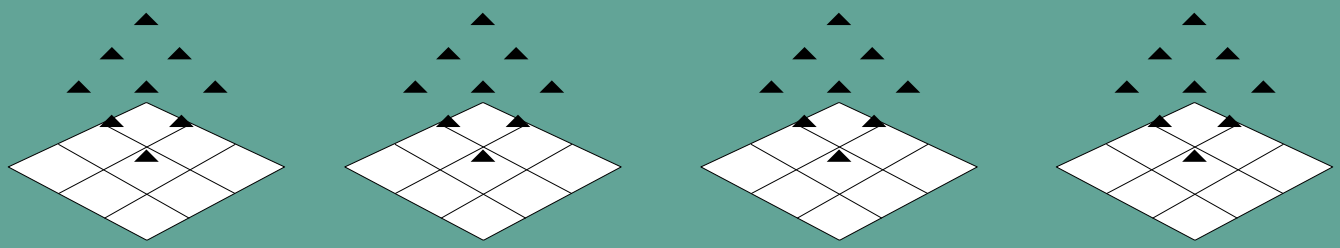
Call for Participation

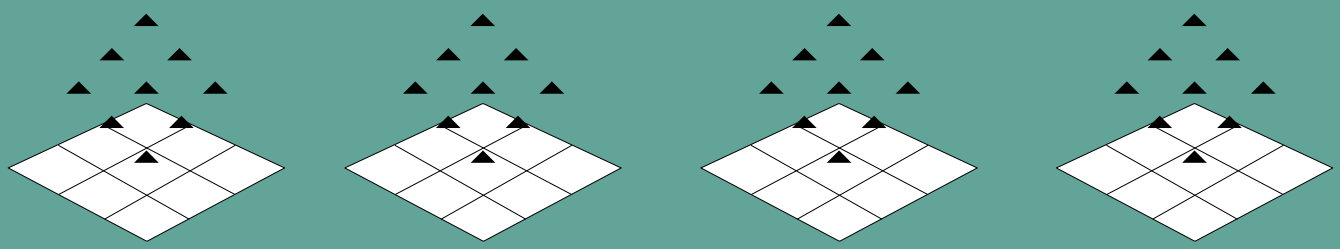
2004 AAAI Fall Symposium Series

October 21–24, 2004 ■ Washington, D.C.

Sponsored by the
American Association for Artificial Intelligence
With Support from the National Science Foundation







Important Deadlines

- May 3, 2004: Submission due to organizers
- May 24, 2004: Notifications of acceptance sent by organizers
- August 31, 2004: Accepted camera-ready copy due to AAAI.

The American Association for Artificial Intelligence is pleased to present the 2004 Fall Symposium Series, to be held Friday through Sunday, October 22–24. The Symposium Series will be preceded on Wednesday, October 21 by a one-day AI funding seminar, which will be open to all registered attendees of FSS-04. The titless of the eight symposia are:

- Achieving Human-Level Intelligence through Integrated Systems and Research
- Artificial Multi-Agent Learning
- Compositional Connectionism in Cognitive Science
- Dialogue Systems for Health Communication
- The Intersection of Cognitive Science and Robotics: From Interfaces to Intelligence
- Making Pen-Based Interaction Intelligent and Natural
- Real Life Reinforcement Learning
- Style and Meaning in Language, Art, and Music

An informal reception will be held on Friday, October 22. A general plenary session, in which the highlights of each symposium will be presented, will be held on Saturday, October 23.

Symposia will be limited to 40-60 participants each. Participation will be open to active participants as well as a limited number of interested individuals on a first-come, first-served basis. Each participant will be expected to attend a single symposium. Working notes will be prepared and distributed to participants in each symposium. Registration information will be available on the AAAI web site in July 2004.

To obtain registration information, write to:

AAAI Fall Symposium Series
445 Burgess Drive
Menlo Park, CA 94025-3442
650-328-3123
650-321-4457 (fax)
fss04@aaai.org
www.aaai.org/Symposia/symposia.html

Submission Requirements

Interested individuals should submit a paper or abstract by the deadline listed below. Please mail your submissions directly to the chair of the individual symposium according to their directions. Do not mail submissions to AAAI.

Achieving Human-Level Intelligence through Integrated Systems and Research

Although there has been substantial progress in some of the subfields of artificial intelligence during the past three decades, the field overall is moving toward increasing subfield isolation and increasing attention to near-term applications, retarding progress toward comprehensive theories and deep scientific understanding, and ultimately, retarding progress toward developing the science needed for higher-impact applications. Recent work in artificial intelligence, in addition to cognitive psychology, neuroscience, and linguistics, presents an opportunity to reverse this specialization and reinvigorate the field's focus on understanding and developing human-level intelligence.

Because there are so few venues for research on integration and because the opportunity is so great, we propose to gather researchers working across the boundaries of their subfields to explore new computational techniques and research methodologies for integrating research results to produce more intelligent systems.

We plan to address three broad topics of interest. First, what can models of vision, language, learning, and reasoning in fields such as cognitive psychology, linguistics and neuroscience contribute to artificial intelligence? Is there a way to describe and organize these results so that they can be more easily shared and combined across subfields? Second, how can we integrate multiple perception, action, representation, learning, planning, and reasoning systems to build cognitive models and intelligent systems that significantly advance the level of intelligence we can model or achieve? Is there a way to characterize the strengths and weaknesses of each approach and determine when to use each? Finally, what kind of theoretical, methodological, or technological innovations are needed to accelerate this research? Will it require advances in cognitive modeling, cross-domain and inter-subfield ontologies, or some kind of institutional transformation?

The topics of interest lead us to encourage a wide range of presentations, including presentations focused on the integration and interconnection of multiple systems, on the contributions of fields such as cognitive psychology, neuroscience, and linguistics to integration questions, and on methodological issues having to do with integration.

Submissions

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. Submissions should be sent to nc@alum.mit.edu. Papers will be published in the symposium proceedings. There will be many opportunities for panel discussions and participant interaction. Participants from all parts of the AAAI community as well as from other fields are encouraged.

See /www.media.mit.edu/~nlc/conferences/fss04.html for additional information.

Organizing Committee

Patrick Winston (cochair), Massachusetts Institute of Technology; Nick Cassimatis (cochair), Naval Research Laboratory; Marvin Minsky, Massachusetts Institute of Technology; Erik Mueller, IBM Thomas J. Watson Research Center; Lera Boroditsky, Massachusetts Institute of Technology

Artificial Multi-Agent Learning

Multiagent systems is a subset of distributed artificial intelligence that emphasizes the joint behaviors of agents in environments with some degree of autonomy. In most such environments there are constraints placed on the degree to which any agent may know what other agents know, or on their communication capabilities, such that the system must have distributed control and cannot be solved with a master-slave model via a single master agent.

In recent years there has been increasing interest in applying machine learning techniques to multiagent systems problems. The presence of large numbers of agents, increasingly complex agent behaviors, partially observable environments, and the mutual adaptation of agent behaviors make the learning process a challenging one. These problems are further complicated by noisy sensor data, local bandwidth-limited communication, unplanned faults in hardware agents, and stochastic environments.

The goal of this symposium is to bring together researchers from diverse areas of the multiagent learning community. Because the dynamics of multiagent learning are such that the correct answer is often not known beforehand, much of the multiagent learning research to date has focused on reinforcement learning or stochastic optimization (evolutionary computation, ant colony optimization, etc.). However we welcome and strongly encourage paper submission from other areas as well. Some topics of interest include, but are not restricted to:

- Coevolution and coadaptation
- Adversarial methods for learning game-playing strategies
- Swarm and social learning methods
- Evolutionary game theory
- Multirobot learning
- Effects of communication on learning
- Discovery of emergent behavior
- Automatic formation of coalitions, contracts, and markets
- Game-theoretic issues in multiagent learning
- Agent modeling

Submissions

Those interested in participating in this symposium should submit a paper from 2,000 to 6,000 words in PDF format, letter paper size. E-mail the paper to Sean Luke (sean@cs.gmu.edu) by the submission deadline. In the e-mail text provide contact information for all authors, and include the paper as an attachment. Expect an acknowledgement of receipt within a week. For more information, see cs.gmu.edu/~eclab/ArtificialMultiagentLearning.html

Organizing Committee

Michael Bowling (bowling@cs.ualberta.ca), Kenneth De Jong (kdejong@cs.gmu.edu), Marie desJardins (mariedj@cs.umbc.edu), Sean Luke (chair, sean@cs.gmu.edu), Mitchell Potter (mpotter@aic.nrl.navy.mil), and Lee Spector (lspector@hampshire.edu)

Compositional Connectionism in Cognitive Modeling

This symposium will bring together connectionist and nonconnectionist researchers to discuss and debate a topic of central concern in AI and cognitive science: the nature of compositionality. The open-ended productivity of the human capabilities aspired to by AI (e.g., perception, cognition, and language) is generally taken to be a consequence of compositionality; i.e., the ability to combine constituents recursively. The aim of this symposium is to expose connectionist researchers to the broadest possible range of conceptions of composition—including those conceptions that pose the greatest challenge for connectionism—while simultaneously alerting other AI and cognitive science researchers to the range of possibilities for connectionist implementation of composition. We therefore welcome and encourage submissions from both proponents and critics of connectionist representations, so long as the work described focuses on compositionality in AI or in the modeling of cognition.

Specifically, the symposium will seek to address the following issues:

- What do we mean by "compositional" in terms of the relationship between the constituents and the composite?
- What do we mean by the process of "composition"?
- Are composition and decomposition (of a given type) completely symmetric operations?
- What constituents (that are relevant to human agency) can be composed?
- What are the consequences of having multiple interacting compositional systems?
- To what extent do "structure-in-time" connectionist models, like Elman's Simple Recurrent Networks, represent compositional structure?
- Do different connectionist models implement different aspects of compositionality, and can they be used in conjunction to address different aspects of composition?

Submissions

Standard talks at the symposium will be allocated 20 minutes for presentation, and papers will be limited to four pages. In addition, the participants are expected to come from a wide range of disciplines. Authors are asked to consider very carefully these constraints of brevity and variable background knowledge in planning their papers. Such constraints will be a primary criterion for evaluating submissions. Send submissions (in PDF, PostScript, or Microsoft Word format) to levys@wlu.edu (Simon D. Levy).

Organizing Committee:

Simon D. Levy, Computer Science Department, Washington & Lee University; Ross Gayler, La Trobe University / Baycorp Advantage Value Solutions; and Pentti Kanerva, Redwood Neuroscience Institute

Dialogue Systems for Health Communication

Since Eliza was developed in 1966, computer scientists and health researchers have attempted to build conversational systems that emulate interactions between health providers and patients. Although Eliza was developed only as a proof-of-concept, more recent systems have been built with the intent to provide low-cost and widely accessible health care in limited treatment domains, and many of these systems have been proven effective in large-scale clinical trials. In addition to the unique challenges of developing health dialogue systems that are safe, scale to thousands of users, and can accommodate the complexity of multiple diseases or health behaviors, dozens of studies in the field of health communication indicate that psychosocial aspects of the provider-patient interaction—such as empathy, trust and liking—are crucial for maximizing outcomes and patient satisfaction, indicating that these should be addressed in automated systems as well.

The goal of this symposium is to bring together researchers in AI—including computational linguistics, planning, user modeling, and social agents—with researchers in health communication, public health and the medical sciences. The overall focus will be the design, implementation and evaluation of effective health dialogue systems, and cover topics such as:

- Automatic generation of dialogue to support patient health education, health behavior change, or chronic disease management, or to provide assistance with daily activities for individuals with physical or cognitive impairments.
- Maintenance of, and reference to, dialogue state and user models across many therapeutic interactions.
- Automatic tailoring of health dialogue to patient characteristics, such as stage-of-change, sensory, or cognitive impairments, etc.
- Approaches to the development and maintenance of trust, working alliance, liking, and other variables that characterize the patient-agent relationship.
- Recognition or display of affect and empathy to support therapeutic goals.
- Uses and comparisons of different conversational modalities, including text, audio, embodied agents, or robots.
- Health communication studies of patient-caregiver interactions intended to inform the development of automated systems.
- Ethical and privacy issues.
- Approaches to evaluation of these systems and results from studies and clinical trials.

Submissions

Potential participants may submit a technical paper (up to 8 pages), or a short paper (up to 4 pages) in the form of an extended abstract or a description of a proposed demo or poster. More information can be found at: http://www.misu.bmc.org/~bickmore/dshc/

Organizing Committee

Timothy Bickmore (chair), Boston University School of Medicine; Neal Lesh, Mitsubishi Electric Research Laboratory; Stacy Marsella, USC Information Sciences Institute; Rosalind Picard, MIT Media Laboratory; Martha Pollack, University of Michigan, Artificial Intelligence Laboratory

The Intersection of Cognitive Science and Robotics: From Interfaces to Intelligence

Principles and methodologies from cognitive science are starting to be applied to autonomous robots. The use of cognitive science in robotics takes varied forms, from using computational cognitive models as reasoning mechanisms for robots, to the design and control of human-robot interaction. This interdisciplinary workshop will bring together researchers in robotics, cognitive science, and human-machine interfaces to examine this emerging area, and hopes to establish a new community for this emerging discipline.

We need to make clear what we mean by cognitive science and by robotics. By cognitive science, we mean work that has some cognitive plausibility (i.e., can arguably be claimed that the representation, strategies, and/or actions have some basis in human cognition; in general C++ code written to do formal reasoning is not cognitively plausible) or person-in-the-loop issues. By robotics, we wish to emphasize embodied systems such as mobile robots and autonomous vehicles, and not just software agents.

Topics and interest include (and are not limited to):

- Use of computational cognitive models in robots and autonomous systems as spatial, temporal or other reasoning mechanisms; as model of human or other agent with whom the robot must interact
- Achieving near-human performance for more effective interactions
- Human subject studies to determine effective interaction model for a given role and task domain
- Cognitive science as applied to interaction design
- Role of the robot during interaction (bystander, collaboration…etc)
- Human-based perceptual or action systems
- Models of emotion for the robot to interact with people
- Studies or models of human-based representations that can be used on the robot to facilitate human-robot interaction

Format

Participants in cognitive science and robotics will be invited to present short position or technical presentations representing different aspects of this field. Position and technical presentations will be followed by longer panel sessions and group discussions. Potential participants should submit either a one to two page position paper, or technical paper up to 8 pages in length (PDF format preferred). Send submissions to schultz@aic.nrl.navy.mil with a subject line of "FSS Submission." We will also be organizing joint sessions with the symposium "Achieving Human-Level Intelligence through Integrated Systems and Research."

Organizers

Alan C. Schultz
Code 5515
Naval Research Laboratory
4555 Overlook Ave., S.W.
Washington DC, 20375
(202) 767-2684 (voice)
schultz@aic.nrl.navy.mil

Cynthia Breazeal
MIT Media Lab
77 Massachusetts Ave, NE18-5th floor
Cambridge, MA 02139
(617) 253-7441 (voice)
(617) 225-2009 (fax)
cynthiab@media.mit.edu

John R. Anderson
Department of Psychology
Carnegie Mellon University
Pittsburgh, PA 15213
412-268-2788 (voice)
412-268-2844 (fax)

Greg Trafton
Code 5513
Naval Research Laboratory
4555 Overlook Ave., S.W.
Washington DC, 20375
(202) 767-3479 (voice)
trafton@aic.nrl.navy.mil

Making Pen-Based Interaction Intelligent and Natural

With the growing interest in and use of PDAs and tablet computers, pen-based interaction has become an area of increasing research interest and practical consequences. To date, however, most pen-based interaction is still done using either traditional mouse motions or with an artificial gesture language like Palm's Graffiti.

This symposium aims to explore what it would take to make intelligent pen-based interaction feel much more like the kind of writing and drawing we routinely do on paper. What would it take to make sketching on a tablet computer, for example, feel as natural as sketching on paper, yet have the computer understand what is being drawn? Can we extend the interaction so that the system also understood the often fragmentary speech and the variety of hand gestures that go with drawing in environments like collaborative design reviews? How can multimodal input such as pen strokes, speech, and gestures be naturally combined and used for mutual disambiguation? Solving these challenges would provide an enormous advance over traditional tools for tasks like design and brainstorming.

The central goal of the symposium is to provide a focus for the growing community interested in making pen-based computing more natural by making it smarter, and interested in uses of pen-based computing that go beyond handwriting recognition. It will as well be an opportunity to cross-fertilize research in AI and HCI, aiming on one hand to make human-computer interaction more natural by making it smarter, and on the other to infuse AI research with the insights and expertise of the HCI community.

We welcome technical papers describing proposed or completed research activities; scene setting papers describing the history of the field and the current landscape; position papers outlining a research agenda for the field; position papers evaluating current ideas and approaches; interactive software and hardware demonstrations; or suggestions for panel discussions.

Papers are due May 3, 2004 and should be sent to Randall Davis (davis at csail.mit.edu).

Acceptance decisions will be made by May 24, 2004. Accepted camera-ready copy is due August 31, 2004.

More information can be found at http://www.ai.mit.edu/conferences/AAAISketching04

Cochairs

Randall Davis, MIT (davis at csail.mit.edu); James Landay, University of Washington (landay at cs.washington.edu); Tom Stahovich, University of California, Riverside (stahov at engr.ucr.edu); Rob Miller, MIT (rcm at mit.edu); Eric Saund, PARC (saund at parc.com)

Real-Life Reinforcement Learning

Reinforcement learning provides the tantalizing promise of enabling computer systems to adapt to their environments and solve challenging problems based on experience instead of explicit programming. Despite several notable successes, widespread adoption of reinforcement learning has been slow. The main issue is not simply how to "scale up" reinforcement learning to larger problems but a need to develop a fundamental understanding of the common research issues that arise in applying learning to real-life problems.

To help focus attention on these common attributes, this symposium will bring together researchers concerned with deploying interactive learning systems in real-world environments such as robotics, production control, network management, financial domains, and video games. It will include case studies of successful systems as well as conceptual and algorithmic work targeted toward eliminating existing stumbling blocks. Some significant questions to be addressed are: What techniques can be used to balance autonomy of learning with problem-specific constraints? Where do reward signals come from? How can background knowledge be brought to bear to improve learning performance? How can exploration be combined with generalization to accelerate learning? How can rich sensors like video and acoustic streams be used to learn behaviors? How can we guarantee online performance of a system during learning? What representations are needed to support learning and acting at multiple time scales and how can these be acquired from experience? How can a system recognize other adaptive agents and engage in multiagent reasoning? Preliminary answers to these questions can help to redirect reinforcement-learning research in productive ways.

Submissions

Potential participants should submit a short paper (no more than 8 pages in AAAI format) describing work recently completed or in progress that they would like to discuss. Previously published papers will be considered, but we request that authors organize the submission to highlight the connection to the theme of the symposium.

The deadline for submissions is May 3, 2004. Please send submissions to Michael Littman (mlittman@cs.rutgers.edu) for distribution to the committee. All submissions must be made via email with PDF format preferred. Acceptance notifications will be sent out on May 24, 2004.

Organizing Committee

Michael Littman (co-organizer), Rutgers University (mlittman@cs.rutgers.edu); Satinder Singh (co-organizer), University of Michigan (baveja@eecs.umich.edu); Rich Sutton, University of Alberta (Rich@richsutton.com), Peter Stone, The University of Texas at Austin (pstone@cs.utexas.edu), Amy McGovern, University of Massachusetts, Amherst (amy@cs.umass.edu), Sridhar Mahadevan, University of Massachusetts, Amherst (mahadeva@cs.umass.edu)

Style and Meaning in Language, Art, and Music

In recent years a growing number of researchers working in artificial intelligence, cognitive science, computer graphics, and multimedia have begun to address issues of "style" or connotative semantics in their work. While it is still difficult to precisely characterize these concepts satisfactorily (we know it when we see it), common denominators of much of this work are: an emphasis on manner rather than topic, a focus on affective aspects of expression and understanding, and a search for "dense" representations of meaning in which elements simultaneously symbolize multiple meanings at once.

Recent areas of research in this vein have included forensic authorship attribution, information retrieval based on document genre or affect, composition of new music in a given composer's style, rendering animation in different motion styles, analyzing architectural styles for function and affect, and much more. Work in all media shares the problem of formalizing a notion of style, and developing a modeling language that supports the representation of differing styles. However, due to the widely varying technical requirements of work in different media, little communication has traditionally existed between different "style researchers." The goal of the symposium is to bring such individuals together, to seek out common languages and frameworks for discussion, as well as to establish a shared set of stylistic tasks, which can be used as a testbed for extending and generalizing stylistic work.

The Challenge

While much work remains in developing shared formalisms for style and connotation, we outlined a set of questions, which are more-or-less common to work in all various media. These challenge questions will serve as foci for the symposium:

- Is there a general theory for style, which cuts across all kinds of human intellectual behavior? What is the relation between style and other content (e.g. informational) in the work you will be reporting at the symposium?
- Is there a general theoretical structure for the context that informs style and connotation that can be applied usefully in disparate media? Are there lessons in work you will be reporting at the symposium that are generalizable across media and genre?
- In operational terms, what are useful models and effective algorithms of the process of learning and producing style, and how can such models inform our understanding of stylistic features in the resulting work? In the work you will be reporting at the symposium—can the models and algorithms be used for both understanding style and generating style?
- Is style at the forefront of people's understanding the medium and discourse in the community you have worked with? Is style explicitly discussed or implicitly understood? How are stylistic distinctions learnt and transmitted to others within the community of recipients? In the work you are presenting, how is style understood by the intended audience?
- How can we usefully model the social context of a work, as a resource for understanding its style, its meaning, and its effect? Does the work you report take the context and effect of style outside the medium itself into account?
- What are the processes affecting stylistic diffusion among members of a discourse community? What properties of the social context may affect the transmission or evolution of distinctive styles? How is the work you are presenting affected by understanding the social networks in which style is embedded?

Submissions

We encourage submissions from researchers working in all media. Particularly, in addition to academic researchers, we are interested in presentations or demonstrations by practitioners and artists using computational methods in their own work. For additional information about the symposium, and specific requirements for submission, see: music.ucsd.edu/~sdubnov/style2004

Organizing Committee

Shlomo Argamon, Illinois Institute of Technology (chair); Roger Dannenberg, Carnegie Mellon, University; Shlomo Dubnov, Univestiry of California San Diego (chair); Graeme Hirst, University of Toronto; Julie Jupp,The University of Sydney (chair); Jussi Karlgren, Swedish Institute of Computer Science; Moshe Koppel, Bar-Ilan University; Mine Ozkar, Massachusetts Institute of Technology; James Shanahan, Clairvoyance Corporation.