Call for Participation

2007 AAAI Spring Symposium Series

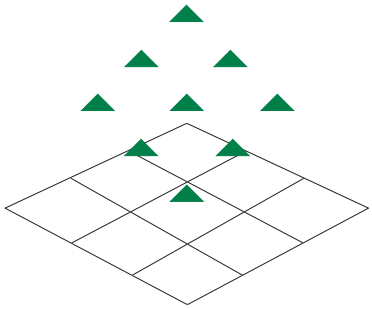
March 26–28, 2007
Stanford University, Stanford, California

Sponsored by the American Association for Artificial Intelligence
In cooperation with Stanford University

sss07@aaai.org
www.aaai.org/Symposia/symposia.html

Deadlines Common to All Symposia

- October 6, 2006: Submission Deadline
- November 3, 2006: Notification of Acceptance
- January 26, 2007: Final Electronic Camera-Ready Copy Due



THE AMERICAN ASSOCIATION FOR Artificial Intelligence, in cooperation with Stanford University's Computer Science Department, is pleased to present its 2007 Spring Symposium Series, to be held Monday through Wednesday, March 26–28, 2007 at Stanford University in Stanford, California. The topics of the nine symposia in this symposium series are:

- Control Mechanisms for Spatial Knowledge Processing in Cognitive / Intelligent Systems
- Game Theoretic and Decision Theoretic Agents
- Intentions in Intelligent Systems
- Interaction Challenges for Artificial Assistants
- Logical Formalizations of Commonsense Reasoning
- Machine Reading
- Multidisciplinary Collaboration for Socially Assistive Robotics
- Quantum Interaction
- Robots and Robot Venues: Resources for AI Education

An informal reception will be held on Monday, March 26. A general plenary session, in which the highlights of each symposium will be presented, will be held on Tuesday, March 27.

Symposia will be limited to between forty and sixty participants. Each participant will be expected to attend a single symposium. Working notes or AAAI technical reports will be prepared and distributed to participants in each symposium. In addition to invited participants, a limited number of interested parties will be able to register in each symposium on a first-come, first-served basis. Registration information will be available in December. To obtain registration information, write to:

AAAI Spring Symposium Series
445 Burgess Drive
Menlo Park, CA 94025-3442 USA
Voice: 650-328-3123
Fax: 650-321-4457
sss07@aaai.org
www.aaai.org/Symposia/symposia.html

Submission Date

Submissions for the symposia are due on October 6, 2006. Notification of acceptance will be given by November 3, 2006. Material to be included in the working notes or technical report of the symposium must be received by January 26, 2007.

Please see the appropriate section in each symposium description for specific submission requirements.

Control Mechanisms for Spatial Knowledge Processing in Cognitive / Intelligent Systems

CRUCIAL ASPECTS OF COGNITIVE systems, may they be robots, (software) agents, or humans are (a) spatial knowledge processing and (b) mechanisms for control of information processing. Consequently, over the last decade(s), there has been a growing interest in the understanding and realization of both aspects in all three types of cognitive systems. Despite the substantial research effort devoted to control mechanisms and spatial knowledge processing as such, however, control mechanisms for spatial knowledge processing have virtually been neglected.

Therefore, results about and conceptions of control mechanisms in spatial knowledge processing are hardly available. For example, in the light of the numerous different spatial representations proposed so far, the question arises by which control mechanisms the employment of the most suitable representation structure can be achieved. The goal of this symposium is to give first answers to this and related questions by bringing together researchers from AI and cognitive science. Participants are asked to provide thoughts on the integration of the two perspectives rather than just presenting specific results from one of the fields.

Questions to be considered in talks and discussions include, but are not limited to:

- How is the construction of spatial representations controlled?
- How is processing that makes use of spatial representations controlled?
- How is it decided which spatial representations to construct?
- Given several existing spatial representations, how is the selection of one or more of them for processing controlled?
- Can different spatial representations be combined? How is such a combination controlled?
- What are efficient ways to realize control in spatial knowledge processing?

The symposium will be scheduled to provide extensive discussion time and group interactions. There will be a series of presentations with significant question-and-answer time, as well as topic-oriented group discussion sessions.

Submissions

Please e-mail submissions of 3-6 pages (preferably in AAAI format as PDF) to schulth@sfbtr8.uni-bremen.de. Submissions can be position statements, work in progress, or completed work.

Organizing Committee

Holger Schultheis, Universität Bremen (schulth@sfbtr8.uni-bremen.de); Thomas Barkowsky, Universität Bremen (barkowsky @sfbtr8.uni-bremen.de); Benjamin Kuipers, The University of Texas at Austin (kuipers @cs.utexas.edu); Bernhard Hommel, Leiden University (hommel@fsw.leidenuniv.nl)

Program Committee

Ramon López de Mántaras, Spanish Council for Scientific Research (CSIC); Gerard Ligozat, LIMSI-CNRS, Paris-Sud University; Mary-Anne Williams, University of Technology, Sydney; Christian Freksa, Universität Bremen; Rainer H. Kluwe, Helmut-Schmidt-University, Hamburg; Kathleen Stewart Hornsby, University of Maine

For More Information

For more information about the symposium see www.sfbtr8.uni-bremen.de/CoMe/.

Game Theoretic and Decision Theoretic Agents

RECENTLY, GAME AND DECISION theories have proved to be powerful tools with which to design autonomous agents, and to understand interactions in systems composed of many such agents.

Decision theory provides a general paradigm for designing agents that can operate in complex uncertain environments, and can act rationally to maximize their preferences. Decision-theoretic models use precise mathematical formalism to define the properties of the agent's environment, the agent's sensory capabilities, the ways the agent's actions change the state of the environment, and the agent's goals and preferences. The agent's rationality is defined as behavior that maximizes the expectation of the degree to which the preferences are achieved over time, and the planning problem is identified as a search for the rational, or optimal, plan.

Game theory adds to the decision-theoretic framework the idea of multiple agents interacting within a common environment. It provides ways to specify how agents, separately or jointly, can change the environment and how the resulting changes impact their individual preferences.

Building on the assumption that agents are rational and self-interested, game theory uses notions such as Nash equilibrium to design mechanisms and protocols for various forms of interaction and communication that result in the overall system behaving in a stable, efficient, and fair manner.

Applications of intelligent agent technologies are numerous. While prototypical agents are physical, like robots, widely useful are also agents that operate in virtual and electronic environments, like the Internet. They can fetch and filter information, trade, negotiate and participate in auctions on behalf of their human users, and propose solutions to transportation, manufacturing and financial allocation problems.

There is much to be gained from bringing together researchers interested in game theory and decision theory to present recent work on the application of these techniques to agent-based computing.

Submissions

Please submit the paper electronically (at most 15 pages standard LaTeX article style) in PostScript (preferred) or in PDF, to Piotr Gmytrasiewicz at piotr@cs.uic.edu.

Topics

We solicit papers dealing with, but not limited to, the following areas:

Descriptions of agent systems employing game theory or decision theory;

Empirical evaluations of agent systems employing game theory or decision theory;

Theoretical developments in game theory or decision theory applied to agent systems;

Position statements about the use of game theory or decision theory in agent systems.

Descriptions of deployed systems are welcome. We are also interested in the use of non-standard variants of decision theory (including qualitative and logical approaches), and in approaches that combine decision and game theories.

Program Chairs:

Piotr Gmytrasiewicz, University of Illinois at Chicago (piotr@cs.uic.edu); Simon Parsons, Brooklyn College, City University of New York (parsons@sci.brooklyn.cuny.edu)

Program Committee

Cristina Biccheri (Carnegie Mellon University); Craig Boutilier (University of Toronto); Prashant Doshi (University of Georgia); Jon Doyle (North Carolina State University); Amy Greenwald (Brown University); Jeff Kephart (IBM Watson); Sarit Kraus (Bar-Ilan University); Rohit Parikh (City University of New York); Martijn Schut (Vrije Universiteit University); Richard E. Stearns (University of Albany); Wynn Stirling (Brigham Young University); Gerald Tesauro (IBM Watson); Leon van der Torre (Vrije Universiteit Amsterdam); Karl Tuyls (University of Leuven); Russell Vane (Litton PRC); William Walsh (IBM Watson); Michael Wooldridge (University of Liverpool); Shlomo Zilberstein (University of Massachusetts).

Intentions in Intelligent Systems

For More Information

For more information about the symposium see www.cs.uic.edu/~piotr/gtdt07/

INTENTIONS, IN THE SENSE OF AGENTS having specific purposes in mind when they do things, have long played a central and organizing role in the analysis of intelligent behavior. The AAAI 2007 Spring Symposium on Intentions in Intelligent Systems will focus on the role of intentions in implemented (or reasonably foreseeable) AI systems.

We are primarily interested in practical, realistic systems that perform tasks intelligently. The symposium is not intended to be a forum for airing abstract philosophical theories of intention or purely mathematical formalisms for representing intention. Rather the emphasis on ”systems” in the title is intended to focus on the role of intentions in intelligent systems. The goal of the symposium is to bring together key researchers from the different AI traditions to investigate intelligent systems and system behaviors based on or derived from an intentional model.

Topics

Intentions as a principle for the design of intelligent systems

Formalisms of intentions suitable for application in practical systems and their computational properties

Comparison of different approaches to the role of intentions in intelligent systems

Roles for intentions in intelligent systems (for example, explanation, reasoning about other agents, failure handling, ...)

Connections between intentions and other aspects of intelligent behavior (for example, perception, memory, planning, language, emotion, ...)

Architectures for intelligent, intentional systems

Descriptions of and experiences with such systems

The symposium will follow the standard format. Papers will be accepted in either a long or short format. Presentations will be structured to minimize from-the-podium delivery and maximize interaction. One idea that we are considering is to use group exercises to stimulate discussion and encourage contribution throughout the two-and-a-half days. We hope to recruit at least one keynote speaker to provide a different perspective. Suggestions from potential participants are welcome on these or any other aspect of the symposium.

Submissions

Papers should be prepared using the two-column AAAI conference paper format. Long papers should be at most six pages; short papers at most two pages. Papers must be submitted electronically via the symposium website. More details on manuscript preparation are available at the AAAI Press Author Instructions page.

Symposium Chair

George Ferguson (ferguson@cs.rochester.edu)

Organizing Committee

George Ferguson, University of Rochester; Candy Sidner, MERL; Chuck Rich, MERL; Karen Myers, SRI International; Phil Cohen, Natural Interaction Systems; James Allen, University of Rochester

For More Information

For more information about the symposium see www.cs.rochester. edu/research/sss07/

Interaction Challenges for Artificial Assistants

IN AN INCREASINGLY COMPLEX WORLD, a new wave of intelligent artificial assistants have the potential to simplify and amplify our everyday personal and professional lives. Whether robotic embodiments or software processes, these intelligent agents will help us manage our time, budgets, knowledge, and workflow as they assist us in our homes, offices, vehicles, and public spaces.

To realize the vision of truly useful assistants, our assistants must be personalized, aware of our preferences, adapting themselves to our ways as well as to new tasks. They must become our partners, able to engage in collaborative problem solving and decision making. Crucially, they must engender our trust over an extended period of time, because their behaviour will materially affect our interests and well-being, and even our own behaviour.

In all these capabilities, an essential aspect of the success of our assistants is their interaction with us and with other humans and agents in natural ways that are no more obtrusive than necessary. This interaction must be uniform and coherent over the various functions of the assistant, and be sensitive to the interaction conditions and modalities, and the user's time, mood, and cognitive focus.

Developing such intelligent assistants demands collaboration across disciplines. Designing interaction with them challenges us at the level both of fundamental concepts in human-agent communication and of applied research in system building. Hence, from a multidisciplinary perspective, this symposium will identify the critical issues raised by interaction with intelligent assistants, the specific challenges faced, and the current state of the art. The ultimate goal is to progress towards the most useful paradigms, methodologies, and implementations for human interaction with intelligent artificial assistants.

Submissions

Prospective participants are invited to submit research (up to 8 pages) or position (2 pages) papers, in PDF format, to Neil Yorke-Smith (nysmith@ai.sri.com).

Organizing Committee

Pauline Berry, SRI International; Timothy Bickmore, Northeastern University; Mihai Boicu, George Mason University; Justine Cassell, Northwestern University; Ed H. Chi, Palo Alto Research Center; Michael T. Cox, BBN Technologies; John Gersh, John Hopkins University; Jihie Kim, USC/Information Sciences Institute; Pragnesh Jay Modi, Drexel University; Donald J. Patterson, University of California at Irvine; Debra Schreckenghost, NASA Johnson Space Center/Metrica Inc.; Richard Simpson, University of Pittsburgh; Stephen F. Smith, Carnegie-Mellon University; Sashank Varma, Stanford; Neil Yorke-Smith (chair), SRI International

For More Information

For more information about the symposium see www.ai.sri.com/~nysmith/organizing/sss07/

Logical Formalizations of Commonsense Reasoning

ONE OF THE MAJOR LONG-TERM GOALS of AI is to endow computers with common sense, and one approach to this goal is to formalize commonsense reasoning using mathematical logic. This is the focus of this symposium. The challenges to creating such a formalization include the accumulation of large amounts of knowledge about our everyday world, the representation of this knowledge in suitable formal languages, the integration of different representations in a coherent way, and the development of explicit reasoning methods that use these representations. Specific topics of interest include the following:

- Change, action, and causality
- Ontologies, including space, time, shape, and matter
- Levels of granularity of ontology and reasoning
- Large commonsense knowledge bases
- Axiomatizations of benchmark commonsense problems
- Exploration of new commmonsense domains in a preformal way
- Nonmonotonic reasoning
- Formal models of probabilistic reasoning formal theories of context
- Mental attitudes
- Belief change, update, and revision
- Cognitive robotics
- Reasoning about multi-agent systems
- Aspects of commonsense reasoning applicable to the Semantic Web
- Applications of formal representations to applications
- Other mathematical tools for capturing commonsense reasoning

The focus of the symposium is on formal representation rather than on algorithms. While mathematical logic is expected to be the primary lingua franca of the symposium, we also welcome papers using a rigorous but nonlogic-based representation of commonsense domains. Technical papers offering new results in the area are especially welcome; object-level theories as opposed to metalevel results are preferred. However, survey papers, papers studying the relationship between different approaches, and papers on methodological issues such as theory evaluation, are also encouraged.

We are pleased to be able to hold this symposium as a special event in honor of John McCarthy's 80th year. John McCarthy is, of course, the father of formal commonsense reasoning, and submissions that celebrate his immense contribution to the field are especially welcome.

Submissions

Papers or extended abstracts of no more than 6 pages should be submitted as e-mail attachments to commonsense07@ucl.ac.uk (PDF format) by October 6, 2006. All submissions will be reviewed by the program committee.

Symposium Cochairs

Eyal Amir, University of Illinois; Vladimir Lifschitz, University of Texas at Austin; Rob Miller, University College London

For all enquiries please e-mail the symposium cochairs at commonsense07@ucl.ac.uk.

For More Information

For more information about the symposium see www.ucl.ac.uk/commonsense07.

Machine Reading

THE TIME IS RIPE FOR THE AI COMMUNITY to set its sights on machine reading—the automatic, unsupervised understanding of text. Over the last two decades or so, natural language processing (NLP) has developed powerful methods for low-level syntactic and semantic text processing tasks such as parsing, semantic role labeling, and text categorization. Over the same period, the fields of machine learning and probabilistic reasoning have yielded important breakthroughs as well. It is now time to investigate how to leverage these advances to understand text.

Machine reading (MR) is very different from current semantic NLP research areas such as information extraction (IE), or question answering (QA). Many NLP tasks utilize supervised learning techniques, which rely on hand-tagged training examples. For example, IE systems often utilize extraction rules learned from example extractions of each target relation. Yet MR is not limited to a small set of target relations. In fact, the relations encountered when reading arbitrary text are not known in advance! Thus, it is impractical to generate a set of hand-tagged examples of each relation of interest. In contrast with many NLP tasks, MR is inherently unsupervised.

Another important difference is that IE and QA focus on isolated "nuggets" obtained from text whereas MR is about forging and updating connections between beliefs. While MR will build on NLP techniques, it is a holistic process that synthesizes information gleaned from text with the machine's existing knowledge.

Submissions

This symposium will feature regular paper presentations, 2-3 invited presentations, a poster session, and ample time for discussion. E-mail submissions (maximum of 6 pages in AAAI format) in PDF format to sss07@cs.washington.edu.

Organizing Committee

Oren Etzioni (chair), University of Washington; Ido Dagan, Bar Ilan University; Ronen Feldman, Bar Ilan University; Noah Friedland; Chris Manning, Stanford University; Tom Mitchell, Carnegie Mellon University; Peter Norvig, Google; Dan Roth, University of Illinois

For More Information

For more information about the symposium see www.cs.washington.edu/homes/pjallen/aaaiss07/index.htm

Multidisciplinary Collaboration for Socially Assistive Robotics

HUMAN-ROBOT INTERACTION (HRI) for socially assistive applications emphasizes the centrality of social relationships to our everyday experiences. As we endow robots with interactive capabilities and integrate them into our lives, research is increasingly focused on the design of social interactions that have the potential to enhance the quality of life of a variety of populations. Such robots should use social capabilities to assist humans in physical or cognitive tasks such as rehabilitation and training exercises, therapeutic and educational play, mobility, providing information, housework, and so on.

An effective socially assistive robot must understand and interact with its environment safely, exhibit social behavior, and focus its attention and communication on users in order to help them achieve specific goals. The robot's physical embodiment, appearance, verbal and nonverbal communicative abilities, and empathy play key roles in its assistive effectiveness. The complex integration of social factors and technical design encourages problem-, task-, or issue-based engagement across multiple disciplines with an artifact rich in both social and technological significance.

Research in this field is therefore of interest to, and draws from, a range of disciplines in engineering, health sciences, psychology, social and cognitive sciences, and the arts. This collaboration requires close coordination and communication between diverse communities of practitioners at all stages of the process: inception, design, development, use, and evaluation. Working in this domain is challenging due to the differences in terminology, methodology, practices, and ethical considerations inherent in multidisciplinary collaboration.

Objectives

To showcase current socially assistive robotics projects

To bring together researchers from multiple fields to foster interdisciplinary, as well as intra-disciplinary, discussion about collaboration

To discuss experimental design for socially assistive human-robot interaction

To explore factors relevant to the acceptance of assistive robots by a community of users (especially those with special needs)

To consider how different research questions, analytical frameworks, and methods can be applied to building assistive robots that interact socially with humans

Submissions

Prospective participants should submit an extended abstract (up to three pages) describing recent work. Authors should specify whether expansion to a full paper (up to eight pages) is possible and/or desired; authors of selected papers will be invited to expand and present at the Symposium, and authors of abstracts will be invited to attend and participate in alternative programming (for example, panels). All submissions are due in PDF format to Adriana Tapus at tapus@usc.edu by the AAAI submission deadline. Submissions will be judged on technical merit and on potential to provoke active discussions. The output of the Symposium will be organized into a AAAI technical report.

Organizing Committee

Adriana Tapus (cochair), University of Southern California; Marek Michalowski (cochair), Carnegie Mellon University; Selma Sabanovic (cochair), Rensselaer Polytechnic Institute; Cynthia Breazeal, Massachusetts Institute of Technology; Kerstin Dautenhahn, University of Hertfordshire; Carl DiSalvo, Carnegie Mellon University; Maja Mataric`, University of Southern California; Francois Michaud, University of Sherbrooke; Illah Nourbakhsh, Carnegie Mellon University; Reid Simmons, Carnegie Mellon University

For More Information

For more information about the symposium see www-robotics.usc.edu/~tapus/AAAISpringSymposium2007/

Quantum Interaction

THE ORGANIZERS OF THIS SYMPOSIUM are interested in combining the theory of quantum mechanics and AI. Quantum mechanics (QM) is emerging from physics into nonquantum domains such as human language, cognition, information retrieval, biology, political science, organizations, and AI. The QM model has already been applied to the social interaction; for example, quantum game theory.

This symposium will bring together researchers interested in: (1) application of QM inspired methods to address or to more efficiently solve AI problems in non-quantum domains; (2) application of AI to quantum domains, such as implementation of AI techniques on a quantum computer; or (3) use of QM with AI to address previously unsolved problems in other fields.

The organizers are also interested in whether a QM approach to AI can be supported by field results in a specific content area; for example, nonmonotonic reasoning (NMR), or organizational decision-making.

The connection to AI should be clearly specified. Papers that address some or all of the following QM topics and its application to AI and information technology are desired:

Hilbert spaces

Qubits (the superposition of "off" and "on" states)

Superposition and interference (constructive and destructive)

Entanglement

Quantum collapse (measuring an observable of a system collapses the qubit into an eigenstate; see also, measurement paradox)

Measurement properties (observables or eigenstates)

Measurement paradox (measuring one aspect of a bistable object determines the other, but losing significant information in the process)

Bistability or dual phenomena (multiple energy states; action-observation couples; multiple cultures; multiple word definitions-usages;).

Quantum agents; quantum multi-agent systems; quantum robots.

Papers should also address one or more content areas and its relevance to AI, or how QM merged with AI may be used to solve a specific problem area:

Language

Cognition and brain (for example, attention, pauses, or NMR)

Information retrieval and processing

Biology (for example, neural or mental processing)

Political, psychological or social science

Illusions (visual, auditory or other perceptual phenomena)

Entertainment (for example, the phenomenon of entraining human observers)

Social interaction

Organizations (for example, mergers; culture)

Other (specify)

Organizers

Peter Bruza, Queensland University of Technology, Australia (p.bruza@qut.edu.au); William Lawless, Paine College, (lawlessw@mail.paine.edu); C.J. van Rijsbergen, University of Glasgow (keith@dcs.gla.ac.uk)

For More Information

For more information about the symposium see ir.dcs.gla.ac.uk/qi2007/.

Robots and Robot Venues: Resources for AI Education

MANY UNDERGRADUATE EDUCATORS have embraced autonomous robots over the past decade. In tandem, the number and popularity of robot-themed exhibitions and competitions has surged. These venues spark interest in AI, motivate class or research projects, and invite students into communities that extend beyond the walls of their particular institution. Yet obstacles to participation can be substantial: they include robots' time-and-money costs, curricular constraints, and the competitiveness underlying some robotic venues. This symposium will explore the undergraduate educational space involving autonomous robots, with an eye toward optimizing robots' and robot venues' effectiveness under these and other very real constraints.

The major goal of the symposium is to bring together hardware, software, and curriculum designers, interested educators, and robot contest or exhibition organizers. We will investigate how educators can leverage autonomous robots and robot-themed venues as educational experiences for their students, particularly in an undergraduate setting. Participant presentations, panels, exhibitions, and break-out sessions will form the core of the symposium. Attendees will also participate in a short, hands-on robot contest and exhibition. All of these program elements will build upon a core set of questions:

What makes robot competitions and exhibitions inviting, worthwhile, and feasible for newcomers; what features will keep teams and schools returning?

How can educators maximize the motivation and impact of robots and robot venues for their students while minimizing time-and-money costs?

How might emerging hardware and software resources lower the barriers to robot use and robot-themed community building?

What curricular strategies enable student participation at robot venues or support robotic research projects, while remaining realistic and workable?

Submissions

People interested in presenting are invited to submit a technical paper (2-6 pages, PDF, in AAAI format). Other participants are encouraged to submit a poster abstract, a statement of interest, or a description of an in-progress robotic system, venue, or educational strategy they would like to discuss. Submissions should be sent to dodds@cs.hmc.edu. By targeting and expanding upon the symposium's core themes, we seek a program that will be both inclusive and focused. Feel free to contact the organizing committee with other concerns or questions..

Organizing Committee

Doug Blank, Bryn Mawr College; Zachary Dodds, Harvey Mudd College; Paul Rybski, Carnegie Mellon University; Jerry Weinberg, Southern Illinois University Edwardsville; Holly Yanco, University of Massachusetts Lowell.

For More Information

For more information about the symposium see www.cs. hmc.edu/roboteducation.