




Call for Participation

2006 AAAI Fall Symposium Series

October 13–15, 2006  Hyatt Regency Crystal City, Arlington, Virginia

Sponsored by the American Association for Artificial Intelligence

With support from the Naval Research Laboratory

445 Burgess Drive, Menlo Park, California 94025  650-328-3123  650-321-4457 (fax)  www.aaai.org/Symposia/Fall/2005/

Important Deadlines

May 1, 2006: Submission due to organizers

May 22, 2006: Notifications of acceptance sent by organizers

August 31, 2006: Accepted camera-ready copy due to AAAI.

Web Site

www.aaai.org/Symposia/Fall/fss06symposia.php



Photo courtesy Arlington Convention and Visitors Bureau

The American Association for Artificial Intelligence is pleased to present the 2006 Fall Symposium Series, to be held Friday through Sunday, October 13–15 at the Hyatt Regency Crystal City in Arlington, Virginia. The symposium series is sponsored by the American Association for Artificial Intelligence, with support from the Naval Research Laboratory. The titles of the eight symposia are:

- Aurally Informed Performance: Integrating Machine Listening and Auditory Presentation in Robotic Systems
- Capturing and Using Patterns for Evidence Detection
- Developmental Systems
- Image Comprehension
- Integrating Logical Reasoning into Everyday Applications
- Interaction and Emergent Phenomena in Societies of Agents
- Semantic Web for Collaborative Knowledge Acquisition
- Spacecraft Autonomy: Using AI to Expand Human Space Exploration

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. Registration information will be available on the AAAI web site in July 2006.

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.

For full descriptions and submission instructions, please consult the AAAI Fall Symposium Web site and the supplementary symposia pages, or contact:

American Association for
Artificial Intelligence
445 Burgess Drive, Suite 100
Menlo Park, California 94025 USA
Telephone: 650-328-3123
Fax: 650-321-4457
E-mail: fss06@aaai.org

Aurally Informed Performance: Integrating Machine Listening and Auditory Presentation in Robotic Systems

Robots designed to function as appliances and human surrogates in public and private settings are already being moved from research projects to fully deployed systems. In keeping with the goals of intuitive human-robot interaction, many of these platforms incorporate rudimentary speech communication interfaces, and others are engineered for specific types of listening tasks. Even so, aurally informed behaviors in robots, and their integration with other perceptual and reasoning systems, remain far behind the broad and mostly transparent skills of human beings.

Part of the problem is that while much is known about the human physiology of listening, much less is understood about how conceptually bounded information is extracted from the mixtures of sounds that are typically present in interactive settings. This is the problem of auditory scene analysis—how people make sense of what they hear. Just as people do, robots must be able to determine the location of sound sources and their type. They must associate certain sounds with the causes of the sounds and events. When interacting with people, robots must be able to converse on the basis of what they hear and see and may even have additional, nonspeech auditory display functions ranging from alerting to the playback of captured sounds. Social settings also raise practical performance issues for robots such as being interrupted while speaking, excessive ambient noise or quiet, the user’s physical listening distance, the acceptability of being overheard or disturbing others, and so on.

The purpose of this symposium is to gather together researchers in machine listening, speech systems, and general robotics, as well as those in other disciplines, including AI, neuroscience, and the cognitive and social sciences, who are interested in a collaborative, interdisciplinary exploration of the range of issues that concern aurally informed performance in robots. The goal is to share results, positions, and insights across boundaries that concern challenges in robotic audition, auditory presentation, and the integration of these functions with other sensory and processing systems in the context of human-robot interaction and the auditory needs and preferences of users.

Submissions

Prospective participants are invited to submit a research abstract or a position paper. Submissions that describe computational approaches to aurally informed performance and/or, empirical results, work-in-progress, speculative approaches, and theoretical issues that bear on the topic are all encouraged. Papers are to be two to six pages in length and must be submitted by e-mail in PDF format to derek.brock@nrl.navy.mil with the phrase “FSS06-submission” in the subject line.

Organizing Committee

Derek Brock (cochair), Naval Research Laboratory (derek.brock@nrl.navy.mil); Ramani Duraiswami (cochair), University of Maryland (ramani@umiacs.umd.edu); and Alexander I. Rudnicky (cochair), Carnegie Mellon University (alex.rudnicky@cs.cmu.edu).

Capturing and Using Patterns for Evidence Detection

Pattern-based analysis of data plays an increasing role in several important applications. In crime prevention (including securities trading, tax fraud, and homeland security) it is being used both to detect evidence of criminal events and to predict threatening activities before they completely mature. In marketing it is being used to assess trends in the aggregate sentiments of populations as well as the preferences of individuals. In epidemiology it is used to assess health trends in populations and provide early warning of epidemics. In these applications the data is typically incomplete and becomes available incrementally over time, and it can often support alternative interpretations, so assessing the quality of the evolving evidence among a set of competing hypotheses is critical. This symposium will bring together researchers from diverse backgrounds, including machine learning, data management, graph theory, link analysis, information retrieval, privacy, automated reasoning, and knowledge representation, to promote advances in acquiring and using patterns for detecting and managing evidence in data.

Topics

Topics of particular interest include:

- Learning patterns from data
- Identifying patterns efficiently within massive, structured, or partially structured data
- Matching algorithms for specific data characteristics (inexact matching, etc.)
- Reasoning with patterns (deduction, abduction, induction, disjunction, negation, etc.)
- Representing patterns and hypotheses
- Hypothesis management (monitoring predictions, interactive refinement, etc.)
- Managing conflicting and uncertain data (probabilities, knowledge gaps, etc.)
- Data and reasoning provenance
- Data access issues (privacy, secrecy, proprietary, etc.)
- Applications (homeland security, fraud detection, epidemiology, marketing, etc.)
- Evaluation of pattern analysis systems

- Pattern and hypothesis sharing among tool sets (interlingua, work flows, etc.)
- Data and algorithm characterization
- Equality detection (alias resolution, etc.)
- Group detection (collaboration networks, etc.)

Submissions

Potential participants may submit a technical paper (up to 8 pages), or a short paper (up to 3 pages) in the form of an extended abstract or a description of a proposed demo or poster. Potential participants who are unable to submit a paper are encouraged to submit a one-page statement of interest. Submissions in PDF using AAAI format should be sent to murray@ai.sri.com.

Organizing Committee

Ken Murray (cochair), SRI International (murray@ai.sri.com); Ian Harrison (cochair), SRI International (harrison@ai.sri.com); Fotis Barlos, BAE Systems; Tina Eliassi-Rad, Lawrence Livermore National Laboratory; Henry Goldberg, National Association of Securities Dealers; Seth Greenblatt, 21st Century Technologies, Inc.; Dunja Mladenic, J. Stefan Institute; Robert Popp, Aptima, Inc.; Ben Rode, Cycorp

Additional Information

<http://www.ai.sri.com/~murray/aaai-patterns/>

In nature, the processes of biological development have been pivotal in nature's ability to construct adaptable, modularized, and self-repairing systems of incredible complexity. The development of multicellular organisms from a single cell provides a plentiful and rich source of knowledge and inspiration for constructing developmental systems that model biological processes and/or enhance evolutionary design systems.

Development biology-inspired approaches represent a method for facilitating the construction of robust, complex adaptive systems in a more modular and evolvable manner than conventional methods. For example the state of the art in evolutionary robotics involves evolving controllers for robots with fixed morphologies, rather than all aspects of the robot. Artificial developmental systems may be useful for overcoming this limitation: biological development relies on coupled growth of all of an organism's sub-systems in parallel, and the evolution of modular gene sub-networks and phenotypic modules.

This symposium is intended to stimulate discussion about how best to extract the key principles of biological development as they relate to design of complex artifacts and computation in general. We will focus discussions around the following questions:

- Which mechanisms of biological development are useful as general design principles, and which are only relevant to biological development?
- What purpose does computational development serve?
- What is the current state of computational development and its future?
- What is the relationship between development and evolution in both natural and artificial systems?
- How should we define the terms "development," "morphogenesis," and "regeneration" in our field, as opposed to how they are used in biology?
- How would one compare the design abilities of a standard evolutionary algorithm to a developmental system?

- How can desirable design principles—such as adaptation, evolvability, scalability, and modularity—be maximized in a developmental system?
- What kind of benchmarks and metrics could be used to test and compare different developmental systems?

The symposium schedule will be divided according to themes. Presentations will comprise peer-reviewed paper presentations and demonstrations of computer simulations. All presenters will be required to explain how their work fits into the area of computational development and explain its significance. Each session ends with an open discussion held amongst attendees debating issues brought out through the presentations.

Submissions

Those interested in participating in this symposium should send either a full paper (8 pages maximum) or a position paper (1-2 pages) in AAAI format in PDF to Sanjeev Kumar at sk525@cornell.edu.

Organizing Committee

Sanjeev Kumar (cochair), Sibley School of Mechanical and Aerospace Engineering, Cornell University (sk525@cornell.edu); Gregory S. Hornby (cochair), UCSC University Affiliated Research Center at NASA Ames Research Center (hornby@e-mail.arc.nasa.gov); Joshua Bongard (cochair), Sibley School of Mechanical and Aerospace Engineering, Cornell University (josh.bongard@cornell.edu)

Image Comprehension

For most computer vision applications, a typical system is composed of the following four components: (1) acquisition—sensor inputs, (2) processing—object and pattern recognition and labeling, (3) analysis—means of obtaining quantitative and qualitative information from an image, and (4) comprehension (understanding)—knowledge about the image which supports rapid decision making and action.

The underlying hypothesis of this symposium is that it may not be necessary to go through this sequence of steps in depth to arrive at some level of comprehension rich enough to support real-time decision-making and action.

The symposium is interested in robotic image-comprehension (not image-acquisition, processing or analysis in the classical sense). We solicit papers that address the endowment of robots with a machine-intelligence approach to near real-time image comprehension. This may involve such things as novel representations and systematic handling of evolving image information or the real-time generation and use of informal ontologies to support the comprehension process from a semantic-technology perspective.

Topics

Topics of interest include the following:

Rapid determination of the meaning of the content of an image: In order to support near real-time decision-making on the part of a robot looking at the image of a scene, methods for assigning meaning to the images features are needed. What are they?

Minimal clues (features) to support comprehension: Assuming that for the rapid comprehension of an image by a robot only selected features in the image are necessary, then what are these features, how are these features selected, and how can a minimal number of features be identified? These are some of the questions that need to be addressed.

Semantic (and syntactic) predisposition of a robot to image comprehension: What does a robot need to know ahead of time in order to realize rapid image comprehension? What roles do limited and unlimited ontologies play in image comprehension? How does it obtain these ontological capabilities?

Mental models formed by a robot to support rapid image comprehension: How does a robot formulate a mental model of an image that can be used to support rapid comprehension and decision-making?

Learning techniques for the enhancement of image comprehension capabilities: Over a period of time it is postulated that, with appropriate learning mechanisms, the robot's performance at image comprehension will improve. What are these mechanisms?

Mathematical formulation of image comprehension concepts: How can image comprehension be formalized to enable analysis and optimization?

Submissions

Those interested in participating in this symposium should send either a full paper (8 pages maximum) or a position paper (1-2 pages) in AAAI format in PDF to walt.truskowski@nasa.gov.

Organizing Committee

Walt Truskowski (walt.truskowski@nasa.gov),
Jacqueline Le Moigne, Bir Bhanu

Additional Information

<http://aaaisymposium.gsfc.nasa.gov/>

Integrating Logical Reasoning into Everyday Applications

Applications such as e-mail clients, Web browsers, spreadsheets and personal finance programs have become an integral part of modern daily life. The user base of some of these programs are in the hundreds of millions of users.

Logical reasoners can aid the users of these programs in several ways. Firstly, they can automate routine, repetitive, or tedious tasks, freeing the user from doing so himself. Secondly, they can script time-critical actions to be taken by the application, even if the user is unavailable or not fast enough to do so himself. Finally, they can be used to constrain aspects of the program's behavior to meet the user's needs.

For example, e-mail filtering rules save the user from having to send e-mail from a known spammer to the trash can and can take timely action such as automatically forwarding important e-mail to a coworker while the user is disconnected from the Internet. Or logical rules can specify constraints on what type of music an mp3 player should play during particular times of the day, or what types of programs a digital video recorder should record.

Enhancing such applications with logical reasoning brings the potential to spread the use of logic beyond the confines of specialized applications and into the mainstream of computing.

One application that has garnered attention recently is the logical spreadsheet. Logical spreadsheets have the potential of providing end users with automated support for making complex decisions based on symbolic reasoning in the same simple manner as current spreadsheets allow them to make complex decisions based on numerical data.

Looking to the future, the promise of the semantic web has opened up the possibility of "scripting the world," as logical rules can reference arbitrary conditions on the Web and produce corresponding side-effects on the Web. Furthermore, the semantic desktop movement promises to integrate ontologies and metadata into the everyday desktop environment.

This symposium is concerned with all aspects of making logic accessible to everyday users, and in incorporating logical reasoners into everyday applications. Such applications include, but are not limited to e-mail clients, spreadsheets, Web browsers, multimedia players, digital video recorders, digital calendars, digital address books, internet telephony applications, financial and accounting applications, and word processors.

Organizing Committee

Michael Kassoff (mkassoff@stanford.edu), Stanford University; Heiner Stuckenschmidt, University of Mannheim; Andre Valente, Knowledge Systems Ventures; Michael Witbrock, Cycorp

Additional Information

<http://logic.stanford.edu/everyday/>

Interaction and Emergent Phenomena in Societies of Agents

Whereas multiagent systems have been extremely helpful in solving engineering problems, much of what we find exciting lies in their applications to contemporary human life. In particular, the focus of this meeting will be on self-constituting systems and networks composed of human and nonhuman agents characteristic of emergent cyber cultures, including e-commerce, e-learning as well as other human/nonhuman agent systems in medicine, law, science and online interactions of all kinds. It represents an opportunity not only to share insights and experiments in multiagent systems composed of robot and software agents, but to theorize hybridity formed at the junction of the human and nonhuman. Multiagent systems, we submit, cross disciplinary boundaries by focusing on society and culture as emerging from the interactions of autonomous agents. Poised at the intersection of AI, cybernetics, sociology, semiotics and anthropology, this strand of multiagent systems research enables a powerful perspective illuminating not only how we live and learn now, but also, through focusing on emergence, how we anticipate the future. Moreover, by convening this interdisciplinary symposium, we hope to form new network assemblages of variegated agents of researchers and their techniques out of which may arise new perspectives on heretofore parochial questions in our respective disciplines. From here, there are manifold policy implications: multiagent systems research, we believe, can be a powerful reagent, interrogating the teleological, emergentist assumptions underlying, for example, the adoption and institutionalization of IT in universities, businesses, hospitals and NGOs, and suggesting other, networked possibilities.

Key Questions

Key questions include the following:

- Emergence of pre-linguistic concepts
- Emergence of shared representations
- Emergence of meaning and language
- How can we characterize the fungible, shifting networks created by human and nonhuman agents?
- How do the environment and the society influence the individual agent and vice versa?

- What are the knowledges, translations or other hierarchies that emerge in such settings?
- What tools do we use in these explorations?
- Are emergent phenomena surprising? if so, to whom? and what effects might such surprise register in a system composed of agents, phenomena and observer?
- Are they surprises to the agent?
- How do these phenomena reflect on the off and on-line societies?

Submissions

Those interested in participating in this symposium should send either a full paper (10 pages maximum) or a position paper (1-2 pages) in AAAI format in PDF to Goran Trajkovski (gtrajkovski@towson.edu).

Organizing Committee

Goran Trajkovski (cochair), Towson University (gtrajkovski@towson.edu); Samuel Collins (cochair), Towson University; Georgi Stojanov, American University in Paris, France; Michael North, Argonne National Laboratories; Laszlo Gulyas, AITIA International Inc., Hungary

Additional Information

<http://pages.towson.edu/gtrajkov/FSS2006/Welcome.html>

Semantic Web for Collaborative Knowledge Acquisition

Recent advances in computing, communications together with the rapid proliferation of information sources and services present unprecedented opportunities in integrative and collaborative analysis and interpretation of distributed, autonomous (and hence, inevitably semantically heterogeneous) data and knowledge sources and services in virtually every area of human activity. The symposium aims to bring together researchers in relevant areas of artificial intelligence, databases, knowledge bases, machine learning, information integration, ontologies, semantic web, web services, and relevant application areas (e.g., bioinformatics, environmental informatics, enterprise informatics e-science, e-government, medical informatics, security informatics, social informatics, among others.) to share recent advances in the state of the art in semantic web technologies for such applications.

Topics

Topics of interest include, but are not limited to:

- ✎ Cyber-infrastructure and semantic web technologies for collaborative knowledge acquisition
- ✎ Modeling semantically heterogeneous data sources and services
- ✎ Collaboratively developing and sharing of ontologies and inter-ontology mappings
- ✎ Discovering and resolving inconsistencies within and among ontologies
- ✎ Representing and reasoning with ontologies and mappings between ontologies
- ✎ Discovering mappings between data source schemas and between ontologies
- ✎ Querying distributed, semantically heterogeneous information sources
- ✎ Acquiring knowledge from distributed, autonomous, semantically heterogeneous information sources
- ✎ Acquiring knowledge from partially specified data
- ✎ Exploiting distributed knowledge and data in dynamic data-driven applications
- ✎ Discovering and composing semantically heterogeneous services

- ✎ Modeling, tracking and using information provenance
- ✎ Modeling and reasoning about trust of information sources and services
- ✎ Extracting knowledge and facts from distributed text and multimedia data
- ✎ Preserving privacy, selective information and knowledge sharing
- ✎ Case studies, software tools, and prototypes

The symposium will include a series of half-day sessions, each addressing a challenge area. Sessions will include invited talks providing overviews of key topics, short presentations based on contributed papers, a poster session for work in progress, breakout sessions focusing on specific research challenges and emerging research directions, a panel discussion and a wrap-up session.

Submissions

Potential participants are invited to submit full papers (up to 8 pages in length), poster summaries or extended abstracts (1-2 pages in length) by May 1, 2006. Each submission will be reviewed by at least two program committee members. Authors of accepted papers and abstracts will be notified by May 22, 2006.

Extended versions of selected papers may be published in a special issue of a journal or an edited book. Partial travel support for graduate and postdoctoral students may be available.

Organizing Committee

Vasant Honavar (chair), Iowa State University; Tim Finin (cochair), University of Maryland, Baltimore County; Doina Caragea, Iowa State University; Sally McClean, University of Ulster; Ion Muslea, Language Weaver, Inc; Raghu Ramakrishnan, University of Wisconsin-Madison; Steffen Staab, Koblenz University

Spacecraft Autonomy

Using AI to Expand Human Space Exploration

Autonomy will be a key component in future human exploration missions. Artificial intelligence technology can provide robust solutions to systems automation and mission operations coordination and can enable an incremental approach that extends from partial sub-system automation to coordination and oversight of distributed operations involving multiple systems and crew.

The goal of this symposium is to identify and explore the artificial intelligence technologies that will allow NASA and other space organizations to operate spacecraft and surface habitats with increased safety and reliability, while reducing the lifecycle costs in terms of mission planning, training, operations and maintenance. Key research issues include: adjustable, human-in-the-loop automation that helps crew and mission operations staff work more safely and efficiently; techniques that robustly handle failures and unplanned outcomes, as well as interruptions and overrides from crew; and techniques to validate automation software and applications. We will also focus on critical functions of spacecraft autonomy such as resource management, fault detection, isolation and recovery, integrated health management, state assessment, mode management, on-board checkout, mission management, and coordination with humans.

We will organize the symposium in a way that encourages discussion as to the best approaches to spacecraft autonomy. We plan to use breakout groups devoted to the topics listed above to discuss research challenges and technology options. We will invite speakers from government, acad-

emia and industry to highlight key challenges in building the next generation of crewed spacecraft.

Submitted papers should address spacecraft autonomy and the use of AI techniques in space exploration, but we encourage paper submissions and participation from those outside of the space community who have insights gained from the use of autonomy in other domains such as aircraft, ships, industrial plants, robotics, military command and control, and smart homes. We are also interested in papers that use AI technologies to build computational architectures that help to integrate the different critical functions of spacecraft autonomy and aid the humans in their decision making processes.

Submissions

Those interested in participating in this symposium should send either a full paper (8 pages maximum) or a position paper (1-2 pages) in AAAI format in PDF to David Kortenkamp (korten@traclabs.com) by the submission deadline.

Additional Information

<http://www.traclabs.com/fss06/>

Organizing Committee

Ari Jonsson, NASA Ames Research Center/USRA (cochair); David Kortenkamp, NASA Johnson Space Center/Metrica Inc. (cochair); Gautam Biswas, Vanderbilt University Robert Brown, Draper Laboratory



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