AAAI 1998

Fall Symposium Series
Registration Brochure

October 23-25, 1998

Omni Rosen Hotel
Orlando, Florida

AAAI presents the 1998 Fall Symposium Series to be held Friday through Sunday, October 23-25, 1998 at the Omni Rosen Hotel in Orlando, Florida. The topics of the eight symposia in the 1998 Fall Symposium Series are:

■ Artificial Intelligence and Link Analysis
■ Cognitive Robotics
■ Distributed Continual Planning
■ Emotional and Intelligent: The Tangled Knot of Cognition
■ Formalizing Reasoning with Visual and Diagrammatic Representations
■ Integrated Planning for Autonomous Agent Architectures
■ Planning with Partially Observable Markov Decision Processes
■ Robots and Biology: Developing Connections

The highlights of each symposium will be presented at a special plenary session. Working notes will be prepared and distributed to participants in each symposium, but will not otherwise be available unless published as an AAAI Technical Report or edited collection.

Each symposium will have limited attendance. Participants will be expected to attend a single symposium throughout the symposium series. In addition to participants selected by the program committee of the symposia, a limited number of other interested parties will be allowed to register in each symposium on a first-come, first-served basis. To register, please fill out the registration form, and send it along with payment to:

1998 Fall Symposium Series

AAAI
445 Burgess Drive
Menlo Park, CA 94025
Telephone: (650) 328-3123*
Fax: (650) 321-4457*
Email: fss@aaai.org*

Credit card orders only, please. Please note that there are security issues involved with the transmittal of credit card information over the internet. AAAI will not be held liable for any misuse of your credit card information during its transmittal to AAAI.

This document is also available at www.aaai.org/Symposia/

Tentative Program Schedule

(subject to change)

Friday, October 23
9:00 AM - 5:30 PM: Symposia sessions
6:00 PM - 7:00 PM: Reception

Saturday, October 24
9:00 AM - 5:30 PM: Symposia sessions
6:00 PM - 8:00 PM: Plenary session

Sunday, October 25
9:00 AM - 12:30 PM: Symposia sessions

Registration will be at the Registration Desk in the Convention Area at the rear of the Omni Rosen Hotel.

Artificial Intelligence and Link Analysis

Computer-based link analysis is increasingly used in law enforcement investigations, insurance fraud detection, telecommunications network analysis, pharmaceuticals research, epidemiology, and a host of other specialized applications. Link analysis explores associations among large numbers of objects of different types. For example, a law enforcement application might examine familial relationships among suspects and victims, the addresses at which those persons reside, and the telephone numbers that they called during a specified period. The ability of link analysis to represent relationships and associations among objects of different types has proven crucial in assisting human investigators to comprehend complex webs of evidence and draw conclusions that are not apparent from any single piece of information.

However, there is both a need and opportunity to apply new technologies. Much of the current software for link analysis is little more than a graphical display tool. While visualizing networks has proven useful, some advanced applications of link analysis involve tens of thousands of objects and links as well as a rich array of possible data models. Manual construction and analysis of such networks has proven difficult. In addition, a large number of related techniques in artificial intelligence and several other fields have the potential to assist human reasoning about complex networks of relationships. These techniques draw on work from search, semantic networks, ontological engineering, autonomous agents, inductive logic programming, graph theory, social network analysis, knowledge discovery in databases, entity-relationship modeling, information extraction, information retrieval, and metaphor.

This two-and-a-half day symposium will bring two communities into contact: 1) Members of the research community who currently have (or could soon develop) useful technology; and 2) Users of link analysis techniques whose needs go beyond the capabilities of current software. Note that the symposium will not focus on current capabilities and applications, but instead on new techniques that can be developed and deployed within 3-5 years. Further Information can be obtained from http://eksl-www. cs.umass.edu/aila/

Organizing Committee

David Jensen (cochair), Computer Science Department, University of Massachusetts, jensen@cs.umass.edu; Henry Goldberg (cochair), National Association of Securities Dealers Regulation, henry.goldberg@nasd.com; William Mills, Office of Research and Development, Central Intelligence Agency; Malcolm Sparrow, John F. Kennedy School of Government, Harvard University; Katia Sycara, The Robotics Institute, CMU; Chris Westphal, Visualization Laboratory, United Information Systems; Raphael Wong, Financial Crimes Enforcement Network, U.S. Treasury Department.

Cognitive Robotics

Most current work in robotics emphasizes basic-level tasks like sensory processing, path planning, manipulator design and control, reactive agents, artificial insects, etc. In contrast, research in cognitive robotics is concerned with the theory and the implementation of robots that reason, act and perceive in changing, incompletely known, unpredictable environments. Such robots must have higher level cognitive functions that involve reasoning, for example, about goals, actions, when to perceive and what to look for, the cognitive states of other agents, time, collaborative task execution, etc. In short, cognitive robotics is concerned with integrating reasoning, perception and action within a uniform theoretical and implementation framework.

Recently, cognitive robotics has attracted the interest of several research groups, and the last few years has witnessed a good deal of work on knowledge representation and especially on reasoning about actions related to actual robots. We believe it would be very fruitful at this point to assemble researchers in this area to discuss their various results, experiences, and future goals. The objective of this symposium is to provide a progress report for this enterprise, and hopefully to demonstrate that cognitive robotics offers a fruitful approach to the design and implementation of autonomous agents. The symposium will be largely discussion-oriented. It will consist of presentations, panels and discussion sessions.

Presentations will mainly aim at giving an overview of the various approaches followed by different research groups, illustrating both achievements already obtained and challenges that remain to be addressed. Panels and discussion sessions will focus on critical issues, like integrating deliberative and reactive behaviors, sensing and exogenous events, multiple robots interaction. There will be also a session for discussing how to design robot competitions in order to show off what cognitive robotics can do. Technical results addressing specific aspects of the "general picture" will be presented in a special poster session. Additional information about the cognitive robotics symposium is available at www.dis.uniroma1.it/~cogrob98

Organizing Committee

Chitta Baral, University of Texas at El Paso (chitta@cs.utep.edu); Giuseppe De Giacomo (Chair), Universita' di Roma "La Sapienza" (degiacomo@dis.uniroma1.it); Kurt Konolige, SRI International (konolige@ai.sri.com); Gerhard Lakemayer, Aachen University of Technology (gerhard@informatik.rwth-aachen.de); Ray Reiter, University of Toronto (reiter@cs.toronto.edu); Murray Shanahan, Queen Mary and Westfield College (mps@dcs.qmw.ac.uk)

Distributed Continual Planning

Many researchers are beginning to study the problem of distributed planning. The increasing emphasis on real-world applications in planning research, AI as a whole, and the funding community has raised the need for distributed systems of cooperating agents for continuous planning and decision support. In the DARPA/Rome Laboratory Planning Initiative alone, researchers are developing technologies in the areas of multiagent planning architectures, distributed planning, mixed-initiative planning, distributed scheduling, and workflow management methods.

This symposium brings together researchers from diverse fields such as classical and reactive planning, distributed AI, robotics, and multi-agent systems to discuss issues and emerging technology for distributed, continual planning. By "distributed planning" we mean that the planning activity is distributed across multiple agents, processes, and/or sites. By "continual planning" (sometimes also referred to as "continuous planning") we mean that the planning process is an ongoing, dynamic process.

The symposium schedule consists primarily of presentations of ongoing research by participants and focused discussion of relevant research topics. Research presentations will include talks on distributed plan representations; reasoning about plans and the planning process; coordinating the distributed planning process; models of teamwork; planning in continuous, dynamic environments; plan repair; and distributed agent environments. Discussion session topics will include mixed-initiative planning, plan recognition, plan quality and utility models for planning, planning under uncertainty, and architectures and infrastructures for distributed, continuous planning. Further information can be obtained from www.erg.sri.com/people/marie/dcp.html

Organizing Committee

Marie desJardins (chair), SRI International, marie@erg.sri.com; Keith Decker, University of Delaware, decker@cis.udel.edu; Ed Durfee, University of Michigan, durfee@umich.edu; David Wilkins, SRI International,wilkins@ai.sri.com.

Emotional and Intelligent: The Tangled Knot of Cognition

Research in neurobiology has provided evidence that emotions pervade human intelligence at many levels, being inseparable from cognition. Perception, attention, memory, learning, decision making, social interaction or communication are some of the aspects influenced by emotions. Their role in adaptation has likewise been evidenced by these studies. In the AI community, the need to overcome the traditional view that opposes rational cognition to absurd emotion has also been acknowledged. Emotion is not regarded anymore as an undesirable consequence of our embodiment that must be neglected, but as a necessary component of intelligent behavior that offers a rich potential for the design of artificial systems, and for enhancing our interactions with them.

This symposium investigates the role of emotions in grounding intelligent behavior, both at the individual and social levels. The main focus is on artificial agents in all sorts of embodiments, and on the possibilities for cross-fertilization between research in artificial emotions and studies of emotions in animals and humans.

Symposium participants will discuss many issues, including:

- Models, architectures, and taxonomies
- Embodiment and biological aspects of emotion
- Emotion synthesis, expression, and recognition
- Emotions, adaptation, and behavior
- Emotions in cognition and learning
- Emotions in social interaction and communication
- Design and implementation issues
- Philosophical aspects
- Applications: art, autonomous and believable agents, education, entertainment, interfaces, medicine, multi-agent systems, pets and personal robots, wearable computing, etc.

Organizing Committee

Dolores Canamero (Chair), Technical University of Catalonia & IIIA, Spanish Scientific Research Council, Spain (lola@iiia.csic.es), Kerstin Dautenhahn, University of Reading, UK, kd@cyber.reading.ac.uk; Hiroaki Kitano, Sony CSL, Japan; Ramon Lopez de Mantaras, IIIA-CSIC, Spain; Chisato Numaoka, Sony CSL, France; Marvin Minsky, MIT, USA; Andrew Ortony, Northwestern University, USA; Rosalind Picard, MIT, USA; Takanori Shibata, MEL, Japan; Aaron Sloman, University of Birmingham, UK.

Formalizing Reasoning with Visual and Diagrammatic Representations

Visual and diagrammatic notations hold huge potential for many areas of computer science. However, this potential is, as yet, largely unrealized. Despite a revived and growing interest in visual representations in many fields, there is little underlying theory and methodology to support the use of such notations, because most existing research has been very application specific. The formalization of reasoning with visual representations is an extremely difficult task, requiring a synthesis of complex representational and computational aspects as well as cognitive aspects. It can therefore serve as a touchstone for our understanding of visual representations.

The primary aim of this symposium is to strengthen the dialogue among the diverse and now largely isolated communities involved in the theory of visual representations and to merge related streams of research from the various communities, such as diagrammatic reasoning, visual language theory, qualitative spatial reasoning, and related sub-fields of HCI, logic, and linguistics.

The symposium will present a mixture of submitted papers and invited lectures. Presentations of submitted papers will enjoy an invited comment and ample time for discussion will be allocated. Invited lectures by experienced researchers will cover key aspects of diagrammatic reasoning and visual language formalization from the different perspectives of the various research fields involved. Additionally an interactive system demonstration session will be organized. Further information can be obtained from www.pst.informatik. uni-muenchen.de/~bmeyer/FRV-DR98/ or bernd.meyer@acm.org

Topics include the following: *Foundational Issues:* Essential characteristics of visual representations; classification of visual representations; diagram understanding and interpretation; cognitive aspects of visual processing; and spatial knowledge representation. *Formal Methods:* Diagram specification techniques; diagrammatic knowledge representation and inference; visual reasoning with diagrammatic languages; modeling interaction with diagrams; sound logical reasoning with diagrams; mathematics of diagrams. *Applications:* Specification of visual languages and environments; diagrammatic reasoning in AI; spatial information systems; design criteria for visual languages; tools for visual arguments or proofs; and tools for visual programming

Organizing Committee

Gerard Allwein (cochair), Indiana University; Kim Marriott (cochair), Monash University; Bernd Meyer (cochair), University of Munich; Michael Anderson, University of Hartford; Alan Blackwell, MRC; B. Chandrasekaran, Ohio State University; Janice Glasgow, Queen's University; Volker Haarslev, University of Hamburg; Patrick Olivier, University of Wales; Atsushi Shimojima, Advanced Institute of Science

Integrated Planning For Autonomous Agent Architectures

Recent advances in robot architectures, algorithms, sensor and effector technology have led to robust execution systems for autonomous agents. Typically, these are layered systems that either lack planning capabilities, or are interfaced in ad hoc ways to classical planing engines. This symposium seeks to investigate answers to the question: given these robust execution systems, what existing or new planning approaches should be used with these architectures and how can they best be integrated?

Our goal is to create a dialogue between mobile robotics researchers who know the needs of autonomous agents and planning researchers who know the capabilities of planners. Our aim is to rethink the role of planning in agent architectures in such a way as to discover new planning approaches or new ways to incorporate planning into robot control architectures. To help generate appropriate discussion, we have identified several general areas and the following key questions:

What is the role of planning? Do robots "need" to plan? That is, do they ever require the capabilities of today's planning systems, beyond path planning? What exactly is meant by the term "planning" in the context of mobile robotics? What kinds of tasks require "planning"? Are these tasks important for the design of mobile robots? What is the role of specialized planners? What is the role of scheduling in robot control?

Communication. How should plans be communicated to the agent's execution system? How should the execution system communicate with the planner? How do these mechanisms effect the structure and internal representation of the planning and executing components of the architecture?

Replanning. Is the replanning/plan fixing paradigm appropriate for mobile robots? When? What effect does the incorporation of replanning have on the agent architecture? Does it change the communication mechanism? How can "online" plan revision be integrated into an autonomous agent such that it is timely and effective?

Architecture. What effect does the planner have on the structure of the executor? What effect does the executor have on the structure of the planner? What are ways that today's planning paradigms can take advantage of the properties of the execution system? Can planning be incorporated without changing the functioning of the executor? What are appropriate internal structures for mobile robot planners?

Organizing Committee

Glenn Wasson (cochair), University of Virginia (wasson@virginia.edu); Gabe Ferrer (cochair), University of Virginia (ferrer@virginia.edu); Pete Bonasso, NASA Johnson Space Center (bonasso@mickey.jsc.nasa.gov); Illah Nourbakhsh, Carnegie Mellon University (illah@cs.cmu.edu); David Miller, KIPR (dmiller@kipr.org)

Planning with Partially Observable Markov Decision Processes

Any deployed planning system must be designed to face the fact that the real world is infused with uncertainty. Partially observable Markov decision processes (POMDPs) are an elegant way of modeling uncertainty in sensing and acting, and can be used as the foundation for robust plan generation and execution. Of course, such expressiveness and mathematical elegance comes with a price; only the simplest of planning problems can be easily described and solved exactly as POMDPs.

However, the last five to ten years have seen advances in our understanding of POMDP algorithms and heuristics, improvements in the overall speed of computing, and increases in the demand for computer support for decision-making under uncertainty. Now is the perfect time to assess the POMDP approach in light of these changes, to figure out where we stand, and to plot a course for continued research and development.

This symposium brings together researchers who have worked in several key focus areas in the study of POMDPs:

- Mathematical and algorithmic foundations
- Approximations and heuristics
- Factored models
- Reinforcement learning
- Robotic applications
- Other applications
- Extensions and specializations

In addition to several invited talks to set the tone, participants will present their work in short, highly interactive presentations to allow all participants to form their own conception of the state of the art and the most promising directions for future research.

Organizing Committee

Michael Littman (cochair), Duke University, mlittman@cs.duke.edu; Tony Cassandra (cochair), MCC, cassandra@mcc.com; Steve Hanks, U. Washington, hanks@cs.washington.edu; Leslie Pack Kaelbling, Brown University, lpk@cs.brown.edu

Robots and Biology: Developing Connections

This symposium proposes a focused topic for discussion by a diverse group of participants. The aim is to present and promote work in the use of robot models to test biological hypotheses. But we wish to attract researchers currently involved in any part of that equation: building robots; doing biological modelling; taking biological inspiration for engineering; or taking robotic inspiration for biological hypotheses. Major aims would be to systematically explore when and how robots can be used in biology, when biological ideas can be applied to robotics, and what both tell us about intelligent control of behaviour.

Additional aims are to explore problems in real-world adaptive intelligence from the perspective of biological and robotic systems; foster mechanisms of communication between biology and robotics; and explore implementation and analysis methods for robot models of biological mechanisms

This symposium aims to advance work in this promising field by addressing the following issues:

- How can we go from neuroethological studies to implementable hypotheses?
- What level or levels of model-building are appropriate?
- What are the most effective evaluation methods for these kinds of models?
- What are the available hardware and software mechanisms for building biological analogs, and what kind of advances in hardware and software are needed?
- What general principles for intelligent behaviour are emerging from these studies?

Further information can be obtained from www.psychology.nottingham.ac.uk/staff/bhw/aaai.html

Organizing Committee

Randall Beer, Dept. of Computer Engineering and Science & Dept. of Biology, Case Western Reserve University (beer@alpha.ces.cwru.edu); Thomas Consi (cochair), MIT Dept. of Ocean Engineering (consi@mit.edu); Holk Cruse, Faculty for Biology, University of Bielefeld (holk@bio128.uni-bielefeld.de); Barbara Webb (cochair), AI Group, Dept. of Psychology, University of Nottingham (Barbara.Webb@nottingham.ac.uk)

Registration & General Information

ALL ATTENDEES MUST PREREG-ISTER. Each symposium has a limited attendance, with priority given to invited attendees. All accepted authors, symposium participants, and other invited attendees must register by September 9, 1998. After that period, registration will be opened up to the general membership of AAAI and other interested parties. All registrations must be postmarked by September 23, 1998.

Your registration fee covers your attendance at the symposium, a copy of the working notes for your symposium, and the reception.

Checks (drawn on US bank) or international money orders should be made out to AAAI. VISA, MasterCard and American Express are also accepted. Please fill out the attached registration form and mail it with your fee to:

AAAI 1998 Fall Symposium Series
445 Burgess Drive
Menlo Park, CA 94025

If you are paying by credit card, you may email the form to fss@aaai.org or fax it to (650) 321-4457. Registration forms are also available on AAAI's web page: www.aaai.org/Symposial.

Please note: All refund requests must be in writing and postmarked by September 30, 1998. No refunds will be granted after this date. A $25.00 processing fee will be levied on all refunds granted.

When you arrive at the Omni Rosen Hotel, please pick up your complete registration packet at the Registration Desk in the Convention Area at the rear of the hotel.

Registration hours will be:

Thursday, October 22
5:00 PM- 7:00 PM

Friday, October 23
8:00 AM- 5:00 PM

Saturday, October 24
8:00 AM - 5:00 PM

Sunday, October 25
8:00 AM - 12:00 PM

Accommodations

For your convenience, AAAI has reserved a block of rooms at The Omni Rosen Hotel. The rate is $139.00 for a single or double room. Symposium attendees must contact The Omni Rosen directly. Please request the group rate for AAAI's Fall Symposium Series when reserving your room. The cut-off date for reservations is September 24, 1998. Reservations after this date will be accepted based on availability at the negotiated group rate.

Omni Rosen Hotel
9840 International Drive
Orlando, Florida 32819-8122
(407) 248-2326
(800) 800-9840

Air Transportation and Car Rental

Discounted fares have been negotiated for this event. Call Conventions in America (CIA) at 1-800-929-4242 and ask for Group #428. Save 5% - 10% off the lowest applicable fares on American Airlines and United Airlines, or the guaranteed lowest available fare on any carrier. Take an additional 5% off if you purchase at least 60 days prior to departure. Travel valid between October 20-28, 1998. All customers will also receive free flight insurance of $100,000. Avis Rent A Car is also offering special low rates with unlimited free mileage.

Reservation hours: M-F 6:30 AM - 5:00 PM PDT. Outside U.S. and Canada, call 619-453-3686 / Fax 619-453-7679. Email: scitravel@aol.com. 24-hour emergency service: 1-800-748-5520. If you call direct, refer to these codes:

    American: 1-800-433-1790, Stafile #
    United: 1-800-521-4041, Tour Code #512QW
    Avis: 1-800-331-1600, AWD #J947822

Parking

Parking is available at the Omni Rosen Hotel. The daily rate for valet parking is $3.00, and $7.00 overnight. Self-parking is complimentary.

Arrival by Air

Orlando International Airport is only 15 minutes away from the Omni Rosen Hotel.

Ground Transportation

This information is the best available at time of printing. Fares and routes change frequently. Please check by telephoning the appropriate numbers below for the most up-to-date information.

Hotel Shuttle

The Omni Rosen Hotel recommends Transtar Shuttle which provides regular transportation between the Omni Rosen and the Orlando Airport. The fare is $12.00 one way. Transtar Shuttle runs every 15 minutes and no reservations are needed.

Taxi

Taxis are available at Orlando International Airport to the Omni Rosen Hotel. The approximate fare is $25.00.

Arrival by Car

The Omni Rosen Hotel is located in the center of International Drive Resort Area, next to the Orange County Convention Center. Take the Bee-Line exit from I-4 to International Drive.

Disclaimer

In offering the Omni Rosen Hotel, American Airlines, United Airlines, Avis Rent A Car (hereinafter referred to as "Supplier") and all other service providers for the AAAI Fall Symposium Series, the American Association for Artificial Intelligence acts only in the capacity of agent for the Supplier which is the provider of hotel rooms and transportation. Because the American Association for Artificial Intelligence has no control over the personnel, equipment or operations of providers of accommodations or other services included as part of the Symposium program, AAAI assumes no responsibility for and will not be liable for any personal delay, inconveniences or other damage suffered by symposium participants which may arise by reason of (1) any wrongful or negligent acts or omissions on the part of any Supplier or its employees, (2) any defect in or failure of any vehicle, equipment or instrumentality owned, operated or otherwise used by any Supplier, or (3) any wrongful or negligent acts or omissions on the part of any other party not under the control, direct or otherwise, of AAAI.

Registration Form–1998 AAAI Fall Symposium Series

All ATTENDEES MUST PREREGISTER Please complete in full and return to AAAI, postmarked by September 9, 1998 (invited attendees) or by September 23, 1998 (general registration). *Please print or type:*

First name _____ Last name _____

Company or Affiliation _____

Address _____ Home ☐ or Business ☐

_____

City _____ State _____

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Daytime telephone _____ E-mail address _____

Symposium
(Please check only one)

☐ 1. Artificial Intelligence and Link Analysis

☐ 2. Cognitive Robotics

☐ 3. Distributed Continual Planning

☐ 4. Emotional and Intelligent: The Tangled Knot of Cognition

☐ 5. Formalizing Reasoning with Visual and Diagrammatic Representations

☐ 6. Integrated Planning for Autonomous Agent Architectures

☐ 7. Planning with Partially Observable Markov Decision Processes

☐ 8. Robots and Biology: Developing Connections

Fee

☐ Member: $ 220.00   ☐ Nonmember: $ 280.00

☐ Student Member $ 100.00 ☐ Nonmember student: $ 125.00
(Students must send legible proof of full-time student status.)

TOTAL FEE *(Please enter correct amount.)* $_____

Method of Payment
(All e-mail and fax registrations must be accompanied by credit card information.
Prepayment is required. No PO's will be accepted.) (please circle one)

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Signature _____

Thank you for your registration! Please mail completed form with your payment to:
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Please Note: Registration cannot be processed if information is incomplete or illegible. Requests for refunds must be received in writing by September 30, 1998. No refunds will be granted after this date. A $25.00 processing fee will be levied on all refunds granted.

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