



AAAI 1996

Fall Symposium Series

Registration Brochure

November 9-11, 1996

*Massachusetts Institute of Technology
Cambridge, Massachusetts*

Sponsored by the
American Association for Artificial Intelligence
445 Burgess Drive, Menlo Park, CA 94025
(415) 328-3123
fss@aaai.org • <http://www.aaai.org/Symposia/symposia.html>

AAAI presents the 1996 Fall Symposium Series to be held Saturday through Monday, November 9-11, 1996 at the Massachusetts Institute of Technology, Cambridge, Massachusetts. The topics of the seven symposia in the 1996 Fall Symposium Series are:

- Configuration
- Developing Assistive Technology for People with Disabilities
- Embodied Cognition and Action
- Flexible Computation in Intelligent Systems: Results, Issues and Opportunities
- Knowledge Representation Systems Based on Natural Language
- Learning Complex Behaviors in Adaptive Intelligent Systems
- Plan Execution: Problems and Issues

The highlights of each symposium will be presented at a special plenary session. There will also be an invited talk held on Monday morning open to all symposium attendees. 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 enclosed form, and send it along with payment to:

1996 Fall Symposium Series
AAAI, 445 Burgess Drive
Menlo Park, CA 94025

Fax: (415) 321-4457

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Email: fss@aaai.org

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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.

Tentative Program Schedule

(subject to change)

Saturday, November 9

Symposia sessions:

9:00 AM—5:30 PM

Reception:

6:00 PM—7:00 PM

Sunday, November 10

Symposia sessions:

9:00 AM—5:30 PM

Plenary session:

6:00 PM—8:00 PM

Monday, November 11

Invited Talk:

9:00 AM—10:30 AM

Symposia sessions:

11:00 AM—12:30 PM

*Registration will be in the foyer of
The Tang Center, Building 51,
Massachusetts Institute of Technology.*

Invited Talk (Monday, November 11):
**The HAL 9000 Computer and
the Vision of *2001: A Space Odyssey***

Presented by **David G. Stork**,
Ricoh California Research Center and Stanford University

“I am a HAL 9000 computer ... I became operational on January 12, 1997”

– Arthur C. Clarke
2001: A Space Odyssey
(1968 novel)

2001: A Space Odyssey, Stanley Kubrick and Arthur C. Clarke’s 1968 epic film about the space exploration, extra-terrestrials and the evolution of intelligence, was the most scientifically precise feature film ever made. Now, on the occasion of HAL’s “birth” (as given in the novel), we can compare the film’s computer science “predictions” with current technological fact—in particular those related to its central character, the HAL 9000 computer. Stork will review the reflections of Marvin Minsky, Doug Lenat, Stephen Wolfram, Raymond Kurzweil, Roger Schank, Donald Norman, Murray Campbell, Daniel Dennett, Ravishankar Iyer and others concerning the film, specifically addressing topics such as artificial intelligence, computer vision, computer lipreading, speech recognition, reasoning, chess, reliability, computer emotion and interface design. Where were the film’s creators optimistic, where pessimistic, and why? What trends and issues were overlooked?

Could we build a HAL?

This nontechnical talk is profusely illustrated with clips from *2001* and current research and sheds new light on key moments of the film—you will never see the film the same way again. Please refer to: <http://matia.stanford.edu/~stork/HALTalks.html>

David G. Stork is chief scientist at the Ricoh California Research Center and head of its Machine Learning and Perception Group as well as a consulting associate professor of electrical engineering and a visiting scholar in psychology at Stanford University. His fourth book, *HAL’s Legacy: 2001’s Computer as Dream and Reality* will be released by The MIT Press in October, 1996; he is also completing the second edition of *Pattern Classification and Scene Analysis* with R. O. Duda and P. E. Hart (Wiley).

Configuration

Configuration involves selecting and arranging parts to fit problem constraints. Configuration problems may involve design, manufacturing, sales, installation and maintenance. The parts need not be physical, e.g. they may be actions in plans.

Configuration problems have a long history in AI going back at least to the pioneering R1/XCON expert system for configuring computer systems. Recently the area has been revitalized by:

- Renewed industrial interest: Ed Feigenbaum highlighted configuration in his “Tiger in a Cage” talk at AAAI-93.
- The rise of constraint satisfaction technology: Constraint programming languages are bringing this technology into the real world. Configuration is a natural constraint satisfaction problem.
- The success of the world wide web and other networked information services: These generate an increasing demand for automated configuration. Companies are seeing their offers/sales ratio increase dramatically to the point where manual configuration is no longer feasible.

At present academic attention in AI to this topic is lagging somewhat behind the industrial level of interest. We hope that this symposium will help to redress that balance. We aim to bring together academia and industry in this forum.

Organizing Committee

Boi Faltings (cochair), Swiss Federal Institute of Technology, faltings@di.epfl.ch; Eugene C. Freuder (cochair), University of New Hampshire, ecf@cs.unh.edu; Alois Haselboeck, Siemens AG, hasel@garwein.hai.siemens.co.at; Ken MacCallum, University of Strathclyde, ken@cad.strath.ac.uk; Deborah L. McGuinness, AT&T Bell Laboratories, dlm@research.att.com; Sanjay Mittal, Catalogics Software Corporation, mittal@ix.netcom.com.

Developing Assistive Technology for People with Disabilities

This symposium will address applying the theory and techniques developed by AI research to the domain of assistive technology for people with disabilities, development of new research within the assistive technology domain, and the user interface issues involved in work in this area. Some areas of current work include the development of new user interfaces for computers to accommodate people with varying motor, hearing or sight disabilities, robotic wheelchairs, sign language translation systems, robotic assistants, text to speech systems for blind people, and automation of the process of converting textbooks and other written materials into recordings for the blind. In addition to presentations and panels at the symposium, a variety of systems will be demonstrated.

The goals of the symposium are as follows:

- Initiate a dialogue between the AI community and other research communities that will facilitate an exchange of ideas to further research progress.
- Identify areas of AI research that can be used to solve problems in this domain.
- Discuss how research in this domain can further general research in AI.
- Present successfully implemented systems.
- Discuss how user interface issues should be addressed when designing systems.

Organizing Committee

Holly Yanco (chair), Massachusetts Institute of Technology, holly@ai.mit.edu; John Aronis, University of Pittsburgh, aronis@cs.pitt.edu; David Miller, KISS Institute for Practical Robotics, kipr@src.umd.edu; Vibhu Mittal, University of Pittsburgh, mittal@cs.pitt.edu; T.V. Raman, Adobe Systems, raman@adobe.com.

Embodied Cognition and Action

The role of physical embodiment in cognition has long been the subject of debate. While it clearly has strong implications on the control strategies for generating purposive and intelligent behavior in the world, some theories have proposed that it not only constrains but also facilitates higher-level cognition.

This symposium will study the role of embodiment in both scaling up control and grounding cognition. We will explore ways of grounding more abstract, typically disembodied, cognitive systems and extending the existing, typically low-level sub-cognitive systems, such as autonomous robots and software agents. The symposium will be an interdisciplinary meeting, drawing from work in AI, philosophy, linguistics, neuroscience, and other sources studying the implications of embodiment in cognition and action. Special topic sessions will include:

- philosophy of embodiment
- language and concept formation
- learning representations
- a review of relevant work in psychology and neuroscience
- issues in motor control and its implications for cognition
- novel implementations merging cognition and embodiment
- robotic implementations

Workshop participants and invited speakers will address each of the topics in focused presentations, followed by extensive open discussions and several panels.

Organizing Committee

Maja Mataric (chair), Brandeis University, maja@cs.brandeis.edu; Dana Ballard, University of Rochester, dana@cs.rochester.edu; Rod Brooks, MIT, brooks@ai.mit.edu; Daniel Dennett, Tufts University, ddenett@pearl.tufts.edu; Simon Giszter, Medical College of Pennsylvania, simon@swampthing.medcolpa.edu; Erich Prem, Austrian AI Institute, erich@ai.univie.ac.at; Terence Sanger, MIT, tds@ai.mit.edu; Stefan Schaal, Georgia Tech, sschaal@cc.gatech.edu.

Flexible Computation in Intelligent Systems: Results, Issues, and Opportunities

Flexible computation refers to procedures that allow a graceful tradeoff between the quality of results and allocations of costly resources, such as time, memory, or information. Systems employing flexible computation gain the ability to adapt the quality of their response to dynamic changes in requirements for precision, and to uncertainty or variation in the cost of computational commodities.

Recent examples of flexible computation techniques include memory-bounded search, anytime algorithms, approximate query processing, and a variety of imprecise computation techniques. Flexible computation has been applied to combinatorial optimization, planning, probabilistic inference, decision making, and theorem proving.

The symposium will provide an opportunity for the sharing of ideas among researchers who have been working with flexible computation on problems in artificial intelligence, information retrieval, databases, operating systems, signal processing, robotics, and numerical analysis.

Topics of interest include fundamental properties of flexible computation, scheduling and monitoring of flexible computation, partitioning resources between object-level and meta-level, representation and learning of performance profiles, programming techniques supporting construction and composition of flexible algorithms, and applications of flexible computation with a focus

on experiences with applications in time-critical environments, or other resource-limited situations.

Further information can be found at <http://flexcomp.microsoft.com>.

Organizing Committee

Eric Horvitz (cochair), Decision Theory Group, Microsoft Research, horvitz@microsoft.com; Shlomo Zilberstein (cochair), University of Massachusetts, shlomo@cs.umass.edu; Louis Hoebel, Rome Laboratory/C3CA, hoebel@ai.rl.af.mil; Jane Liu, University of Illinois, janeliu@cs.uiuc.edu; Mike Pittarelli, SUNY Institute of Technology, mike@sunyit.edu.

Knowledge Representation Systems Based on Natural Language

This symposium addresses the problem of knowledge representation (KR) systems that closely parallel the representational and inferential characteristics of natural language (NL). Its main goal is to discuss the arguments for and against developing NL-based KR systems:

Among the arguments for the NL-as-KR-system approach are:

- Such systems are easy for people to use.
- Most human knowledge is encoded and communicated via NL.
- Such a system can automatically create and update its knowledge base directly from NL input.
- Such systems provide a uniform symbolic representation.
- The same representational and inference mechanism could be used when utilizing previous knowledge for processing new NL inputs.
- It is hard to match expressiveness and precision of NL, particularly in not (well) formalized domains.
- Many scientists believe that mental-level representation of knowledge is close in form to NL.

Among the arguments against the NL-as-KR-system approach are:

- NL is (highly) ambiguous.
- NL has (very) complex syntax, semantics, and pragmatics.
- NL is non-systematic, non-algorithmic.
- NL is (highly) context-dependent.
- NL is (merely) an interface. Inferencing does not belong with NL.

Organizing Committee

Lucja Iwanska (chair), Wayne State University, lucja@cs.wayne.edu; Syed S. Ali, Southwest Missouri State University, syali@sy.smsu.edu; Douglas Appelt, SRI International, appelt@ai.sri.com; R.V. Guha, Apple Computers, Inc., guha@taurus.apple.com; Sasa Buvac, Stanford University, buvac@sail.stanford.edu; Douglas Lenat, CYC Corp., lenat@mcc.com; David McAllester, AT&T Bell Labs, dmacc@research.att.com; Len Schubert, University of Rochester, schubert@cs.rochester.edu; Stuart C. Shapiro, State University of New York at Buffalo, shapiro@cs.buffalo.edu; Wlodek Zadrozny, IBM TJ Watson Research Center, wlozdz@watson.ibm.com.

Learning Complex Behaviors in Adaptive Intelligent Systems

The symposium will consist of invited talks, submitted papers, and panel discussions focusing on practical algorithms and theoretical frameworks that support learning to perform complex behaviors and cognitive tasks. These include tasks such as reasoning and planning with uncertainty, perception, natural language processing, and large-scale industrial applications.

The underlying theme is the automated construction and improvement of complete intelligent agents, which is closer in spirit to the goals of AI than learning simple classifiers. We expect to have an interdisciplinary meeting with participation of researchers from AI, neural networks, machine learning, uncertainty in AI, and knowledge representation.

Some of the key issues we plan to address are:

- Development of new theoretical frameworks for analysis of broader learning tasks such as learning to reason, learning to act, and reinforcement learning.
- Scalability of learning systems such as reinforcement learning.
- Learning complex language tasks.

- Research on agents that learn to behave “rationally” in complex environments.
- Learning and reasoning with complex representations.
- Generating new benchmarks and devising a methodological framework for studying empirical scalability of algorithms that learn complex behaviors.
- Empirical and theoretical analysis of the scalability of different representations and learning methods.

Organizing Committee

S. Kasif (cochair), Johns Hopkins University, kasif@cs.jhu.edu; S. Russell (cochair), Berkeley, russell@cs.berkeley.edu; B. Berwick, MIT, berwick@ai.mit.edu; T. Dean, Brown University, tld@cs.brown.edu; R. Greiner, Siemens Research, greiner@scr.siemens.com; M. Jordan, MIT, jordan@psyche.mit.edu; L. Kaelbling, Brown University, lpk@cs.brown.edu; D. Koller, Stanford University, daphne@cs.berkeley.edu; A. Moore, CMU, awm@cs.cmu.edu; D. Roth, Weizmann Institute, danr@das.harvard.edu.

Plan Execution: Problems and Issues

Traditionally, work on planning has concentrated on how plans can be constructed, but as the planning community has begun to address more complex, real-world problems, the issues surrounding the execution of plans have come to the fore. Systems are being built that construct plans that are used in domains ranging from robot navigation to image processing and information retrieval. Such systems must often be able to handle actions with duration, simultaneous execution of actions, plans with conditionals and loops, and plan failure. These new demands on an agent require considerable extensions to the classical model of plans as simple sequences of actions guaranteed to achieve their goals.

The program will include sessions consisting of presentations of two or three papers on a common theme, comments by a designated commentator, and open discussion; panel presentations followed by open discussion; poster presentations; and demonstrations of implemented systems. Themes include the role of deliberation in execution-based systems, the role of execution in deliberation-based systems, matching domain characteristics and architectures, multi-agent systems, the uses of formalism; and much more.

Further information is available at http://www.dai.ed.ac.uk/staff/personal_pages/louisep/PEsymp/.

Organizing Committee

Louise Pryor (chair), University of Edinburgh, louisep@aisb.ed.ac.uk; R. James Firby, University of Chicago, firby@cs.uchicago.edu; Steve Hanks, University of Washington, hanks@cs.washington.edu; Sam Steel, University of Essex, sam@essex.ac.uk.

Registration & General Information

All attendees must preregister. 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 23, 1996. After that period, registration will be opened up to the general membership of AAAI and other interested parties. All registrations must be postmarked by October 7, 1996.

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

Please fill out the attached registration form and mail it with your fee to:

AAAI 1996 Fall Symposium
445 Burgess Drive
Menlo Park, CA 94025

Checks (drawn on US bank) or international money orders should be made out to AAAI. VISA, MasterCard and American Express are also accepted. Please note: All refund requests must be in writing and postmarked by October 15, 1996.

When you arrive at Massachusetts Institute of Technology, please pick up your complete registration packet in the foyer of The Tang Center. Registration hours will be:

Friday, November 8

5:00 pm - 7:30 pm

Saturday, November 9

8:00 am - 5:00 pm

Sunday, November 10

8:00 am - 5:00 pm

Please call AAAI at 415/328-3123 for further information.

Accommodations

For your convenience, AAAI has reserved a block of rooms at the Royal Sonesta Hotel. The rate is \$129.00 for a single or double room. Symposium attendees must contact the Royal Sonesta Hotel directly. Please identify yourself as an American Association for Artificial Intelligence Fall Symposium registrant to qualify for the reduced rate.

Royal Sonesta Hotel

5 Cambridge Parkway
Cambridge, MA 02142-1299
Telephone (617) 491-3600
Fax (617) 661-5956

Air Transportation and Car Rental

Get there for less on United Airlines, the official carrier for AAAI. Save 5% on lowest applicable fares, some restrictions apply. Save 10% on lowest unrestricted coach class fares with 7 day advance purchase. Travel between November 2-14, 1996. Alamo Rent A Car is also offering special rates starting as low as \$26/day or \$115/week, with unlimited free mileage and bonus frequent flyer miles on United.

For lowest available fares on *any* airline, call Conventions in America, our official travel agency, at 1-800-929-4242 and ask for Group #428.

You will also receive free flight insurance of \$100,000 and become eligible to win free travel worldwide in their bi-monthly drawings. Outside U. S. and Canada, call 619-678-3600 / fax 619-678-3699 / Internet flycia@alboa.com. If you call United direct at 1-800-521-4041, ask for Tour Code #556NT. Alamo 1-800-732-3232, ID#409268 GR.

Parking

Parking on the MIT campus is restricted Monday through Friday from 7:30 am to 4:00 pm. As the dates for the Symposium coincide with a state holiday and normal business will not be conducted at the Institute on those dates, parking by visitors will be permitted in the surrounding lots. Public parking is also available in the garage adjacent to the Marriot Hotel.

Campus Police Parking and Traffic Division has compiled this list of public parking facilities for your use. Please note that all information is subject to change and should not be considered final.

MIT

139 Massachusetts Avenue
253-8232
(\$7.00 per day, \$2.00 hour.)

Park and Lock

354 3rd Street
547-2685. (\$6.00 per day.)

Kinney Systems

Four Cambridge Center (*Entrance is on Ames St. and Broadway*)
492-1956

(\$2.75 for one hour, \$5.25 for two hours, \$7.75 for twelve hours, \$10.50 for 24 hours.)

Kinney Systems

Ten Cambridge Center
621-3115

(\$2.25 for one hour, \$4.50 for two hours, \$6.75 for twelve hours, \$9.00 for 24 hours.)

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.

Arrival by Air

Logan International Airport is approximately five miles from the MIT campus. Taxi fare to the campus is approximately \$15.00, regardless of the number of passengers. Public transportation to MIT is available; although an inexpensive alternative, it is quite cumbersome with luggage and not recommended.

Arrival by Train

You will arrive in Boston at South Station. Taxi service and public transportation are available.

Arrival by Car

MIT is located in Cambridge on Memorial Drive, a major roadway in the region's highway system. From the west and northwest, there is access to Memorial Drive from the Massachusetts Turnpike (Interstate

90) and Route 2. From the north (Interstate 93/Southeast Expressway), the suggested approach is to connect with Storrow Drive in Boston via the central artery bridgeways, heading west on Storrow Drive. Take the Massachusetts Avenue exit onto the Harvard Bridge which crosses the Charles River and leads you straight to MIT's central entrance at 77 Massachusetts Avenue (Building 7).

Disclaimer

In offering the Royal Sonesta Hotel, American Airlines, Alamo 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 assume 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—1996 AAAI Fall Symposium Series

ALL ATTENDEES MUST PREREGISTER
Please complete in full and return to AAAI, postmarked by September 23, 1996 (invited attendees) or by October 7, 1996 (general registration). *Please print or type.*

First name _____ Last name _____

Affiliation _____

Address _____ Home or Business

City _____ State _____

Zip or postal code _____ Country _____

Daytime telephone _____ Net address _____

Symposium

(Please check only one)

- 1. Configuration
- 2. Developing Assistive Technology for People with Disabilities
- 3. Embodied Cognition and Action
- 4. Flexible Computation in Intelligent Systems: Results, Issues & Opportunities
- 5. Knowledge Representation Systems Based on Natural Language
- 6. Learning Complex Behaviors in Adaptive Intelligent Systems
- 7. Plan Execution: Problems and Issues

Fee

Member: \$ 215.00 Nonmember: \$ 275.00

Student Member \$ 100.00 Nonmember student: \$ 125.00

(Students must send legible proof of full-time student status.)

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

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Signature _____

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A \$25.00 processing fee will be levied on all refunds granted.

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