

# Preface

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## AAAI-96

The National Conference on Artificial Intelligence provides a unique opportunity for timely interaction and communication among researchers and practitioners from all areas of AI. This year the program committee continued the policy established two years ago to broaden participation at the conference. Once again, the community has responded enthusiastically, submitting over 640 papers.

Each paper was reviewed by three reviewers under the supervision of one of twenty-eight senior members of the AI community who supervised broad areas of research. The evaluation criteria recognized a wide range of scientific contributions. Of the papers originally submitted, 5 were withdrawn by their authors, 441 were rejected, and 197 were accepted. The reviewers and senior members of the program committee did a superb job, in their diligence, fairness, and enthusiasm.

Ramesh Patil deserves special credit for developing and maintaining a world-wide web site, which we used for reviewer self-selection of papers in the blind review process. In addition, Ben Kuipers and Bonnie Webber, cochairs for next year's conference, provided invaluable assistance at the initial sorting of papers; we have communicated with them throughout to ensure continuity and improvement to the reviewing process. Barbara Hayes-Roth, the conference chair, provided a tone of gracious stability to establish our agenda and guide where needed throughout. But most of all, Carol Hamilton and the entire AAAI staff deserve the strong thanks of the AI community for meeting a grueling schedule and managing the huge volume of papers, reports, and special requests.

To complement the formal presentations, AAAI-96 will continue the popular student abstract and poster program, organized by Maja Mataric of Brandeis University. This program provides an ideal opportunity for students to present and discuss their work during its early stages, meet some of their peers who have related interests, and introduce themselves to more senior members of the field. The program is open to all pre-Ph.D. students and this year drew almost 70 submissions (2 were withdrawn and 45 accepted). The session presents a wonderful opportunity to get acquainted with some of the up-and-coming talent and their new research ideas.

In addition, this year the student abstract and poster program is being run in cooperation with the SIGART/AAAI doctoral consortium program, organized by Vibhu Mittal, University of Pittsburgh and Loren Terveen, AT&T Research. This will be a small, focused gathering that allows selected

students to present their work to a faculty panel. All participants in the abstract and poster program are invited to attend the panel discussions as well.

As in recent years, there is a mobile robot exhibition and competition (organized by David Kortenkamp, NASA Johnson Space Center), plus a full spectrum of workshops (organized by Subbarao Kambhampati, Arizona State University) and a joint exhibition with IAAI-96 (Innovative Applications of AI, organized by Howard Shrobe, Massachusetts Institute of Technology/ARPA and Ted Senator, National Association of Securities Dealers). A summary of the robot competition will be presented by Peter Bonasso, NASA Johnson Space Center and Thomas Dean, Brown University.

Keeping one's eye on the "AI prize" requires weaving together a broad set of computational disciplines. To this end we invited conference participants this year to set aside their research for a weekend and plunge into a unique educational adventure. The tutorial forum (organized by Brian Williams, NASA Ames Research Center) provides an opportunity for researchers to spend two days each year freely exploring exciting advances in disciplines outside their normal focus. We believe this type of forum is essential for the cross fertilization, cohesiveness, and vitality of the AI field. We all have a lot to learn from each other; the tutorial forum promotes the continuing education of each member of the AAAI.

This year's opening keynote address is given by Professor Tom Mitchell, Carnegie Mellon University: "What Have We Learned about Learning?" The AAAI presidential address is given by Professor Randall Davis, Massachusetts Institute of Technology. Recognizing that invited speakers provide a special opportunity to bring people into our community, as well as to highlight important new directions, we have brought a few speakers to the meeting who are engaged in AI-related work, but haven't published before at our meeting. Each of these speakers brings a provocative, fresh perspective to computational aspects of cognition on topics ranging from core AI to operations research, neuroscience, linguistics and anthropology. In addition, Bart Selman, AT&T Bell Laboratories, will moderate a panel presentation on "Challenge Problems of AI." Frederick Hayes-Roth from Teknowledge, Inc., will present a talk jointly sponsored by IAAI-96: "AI: What Works, and What Doesn't."

When the AAAI executive council met in the spring of 1995 to plan this meeting, the strong consensus was to continue the process of sustaining the excitement, innovation, controversy, and intellectual engagement of the annual

meeting. As cochairs we have been delighted and honored to help produce the volume you are now holding. But the real credit goes to the researchers, reviewers, and the AAAI staff who attended to every detail to make the conference and proceedings of the highest quality.

– Dan Weld & Bill Clancey  
Program Cochairs, AAAI-96

## IAAI-96

In this, the Eighth Annual Conference on Innovative Applications of Artificial Intelligence, we present a set of eighteen application case studies that illustrate the broad spectrum of society being affected by artificial intelligence technology. The application domains range from monitoring frog populations in the outback of Australia to processing email for the Clinton White House. The technical range is similarly impressive: neural networks, rule based reasoning and case-based reasoning all play a role in these applications.

Sixteen systems were chosen as winners of the annual Innovative Applications of Artificial Intelligence award. Three of these papers are in the telecommunications domain. Pacific Bell's system helps localize failures in telephone cable networks. GTE has two winning applications. The first helps to optimize performance in cellular phone networks; the second SSCFI, is an autonomous fault isolation system.

Two of the awards are for engineering applications. BULL HN presents a technique, called *dimensional unfolding*, which is used in sheet metal cutting to help optimize the packing of shapes. Schlumberger, one of the earliest companies to apply AI technology, has developed a neural-network based solution to the problem of predicting the quality and performance of the cements used to line the walls of boreholes.

Four systems were given awards for applications that help in knowledge and information management. A team at MIT has worked with the White House office of media affairs to develop an information distribution system that includes email and the world wide web; their application is an expert system that processes the large number of bounced mail messages received daily. Chase Manhattan Bank has begun to use email as a means for direct communication with customers; they have developed an application called EZ Reader that uses rule-based and case-based technologies to decide how to process each incoming message from a customer. Reuters has developed an application to collect and share knowledge in its world-wide customer-support organization. Fannie Mae has developed KARMA, a system for managing business rules from specification through to implementation.

Four case studies were given awards for financial applications. The Settlement Analysis Expert at Frito-Lay helps reconcile discrepancies in the management of inventory in their retail distribution system. Price Waterhouse has developed Comet, a model-based reasoning system that helps auditors to improve the controls in their clients' financial

management systems. Swiss Bank has developed a system for Asset and Liability management in investment portfolios and Equifax Check Services has developed EASY, an expert system for authorizing checks.

Three awards were given to systems that help in business operations. The first, from J Sainsbury PLC, helps manage the logistics of supplying a very large chain of retail stores. An expert system from SIGNAL Versicherungen in Germany helps advise insurance salesmen on how to better meet the clients needs. NASA's Personnel Security Processing Expert System helps personnel managers to decide what security clearances employees need to obtain.

Finally, we present two other case studies: The first is a retrospective from United Healthcare that looks at how an expert system presented at an earlier IAAI conference has evolved over time. The other is an unusual system from Australia, just beginning its deployment, which uses machine learning techniques to recognize the vocalizations of different frog species so that researchers can automatically monitor the population statistics of these species as other species move into their habitat.

The application of AI technology is proceeding rapidly with several new areas seemingly poised to take off. We have invited several speakers to present surveys of new areas of potential application of AI: Robert Abarbanel of Boeing will talk about how AI may begin to play a significant role in the design of commercial aircraft. Richard Lathrop, from the University of California at Irvine, will talk about how AI will play a role in computational biology. George Doddington, of the National Security Agency and SRI International, will talk about the emerging areas of application for speech technology. Mark Boddy, from the Honeywell Technology Center, will discuss applications of AI technologies in planning and scheduling. Doug Smith, of the Kestrel Institute, will talk about applications of AI in software engineering. Finally, Usama Fayyad of Microsoft will discuss applications for knowledge discovery and data mining technologies.

The interaction between basic and engineering research in our field has never been so important. Initially, the IAAI conference was held as a standalone event to highlight the successful application of AI research. For several years, the IAAI has been held at the same time and place as the AAAI National Conference on Artificial Intelligence (or with IJCAI when it is held in North America). We are in the process of integrating these two separate conferences into one larger conference with several tracks. This will help our field to move research results into practice more readily and to more effectively evaluate the research through practical experience. IAAI and NCAI are jointly sponsoring a talk by Rick Hayes-Roth of Teknowledge which looks at this interaction between theory and practice.

– Howard Shrobe & Ted Senator  
Program Chair Program Cochair, IAAI-96