CONFERENCE PROGRAM DESCRIPTION

The IJCAI-97 Conference is composed of four complementary programs:

- The Technical Program, including technical paper presentations by top scientists in the field, invited speakers, and a video program.
- The Tutorial Program (17 tutorials)
- The Workshop Program (32 workshops)
- The Exhibition Program, including the AI Research Exhibition, the RoboCup-97, the Third Open Computer Go Championship, and the New World Expo.

The Technical Program will be available May 15 electronically or by fax/hardcopy using the following methods:
- Visit the IJCAI-97 Web page at:
http://ijcai.org/ijcai-97/
-Send E-mail to: info@ijcai.org

CONFERENCE EVENTS

IJCAI-97 Official Opening Ceremony and Reception

The Opening Ceremony and Reception will be held at Nagoya Congress Center on Monday, August 25 from 6:30 pm to 9:00 pm. The Opening Ceremony will be chaired by Michael P. Georgeff, the Conference Chair of IJCAI-97.

Conference Banquet

Nagoya Castle Hotel
Wednesday, August 27, 7:00 pm - 10:00 pm
Cost: JP Yen 7,000

The conference banquet site has a spectacular view of Nagoya Castle. Everyone will enjoy dinner and the entertainment will feature a traditional Japanese musical performance of koto, Japanese harp.

Please register early as space is limited. For registration information, see the enclosed registration form.

(Venues and times are subject to change.)

INVITED SPEAKERS

Wolfgang Bibel
Technical University Darmstadt, Germany

"Let's Plan it Deductively!"

Logic and its deductive machinery is in high academic regard, but is more or less irrelevant in industry. Even systems supporting an obviously logical task such as planning rarely resort to logic and deduction. Neither truly intelligent planning nor artificial intelligence, in general, will ever be achieved unless deductive mechanisms are given a more central role. The state, results and issues of deduction and deductive planning, and why these two areas matter for AI are thus the topics of this talk.

Margaret A. Boden
University of Sussex, United Kingdom

"Creativity and Artificial Intelligence"

Creativity is a fundamental feature of human intelligence, and a challenge for AI. AI techniques can be used to create new ideas in three ways: by producing novel combinations of familiar ideas; by exploring the potential of conceptual spaces; and by making transformations that enable the generation of previously impossible ideas. AI will have less difficulty in modeling the generation of new ideas than in automating their evaluation.

Cristiano Castelfranchi
National Research Council and University of Siena, Italy

"Modeling Social Action for AI Agents"

Agent-Based Computing needs social intelligence. Some basic issues for understanding and designing social agents will be addressed: the difference between social and collective, as well as between interaction and communication; the trade-off between autonomy and compliance with requests, norms and constraints; the relationships between deliberate cooperation and emergent intelligence and functions; and the foundational role of goal-delegation and goal-adoption for defining different levels of agency and cooperation.

Ernst D. Dickmanns
University of the German Army at Munich, Germany

"Vehicles Capable of Dynamic Vision"

A survey will be given on two decades of developments in the field, encompassing an increase in computing power by four orders of magnitude. The '4-D approach' integrating

expectation-based methods from systems dynamics and control engineering with methods from AI has allowed the creation of vehicles with unprecedented capabilities in the technical realm: autonomous road vehicle guidance in public traffic on freeways at speeds beyond 130 km/h, on-board-autonomous landing approaches of aircraft, and landmark navigation for AGV's, for road vehicles including turn-offs onto cross-roads, and for helicopters in low-level flight (real-time, hardware-in-the-loop simulations in the latter case).

Masayuki Inaba
The University of Tokyo, Japan

"Remote-Brained Robots"

AI and Robotics once shared a dream. Technical advances have led to an age where this dream seems within reach; but it also seems that recent AI and robotics may fail to inspire the next generation of researchers. Remote-Brained Robots may provide a way to reinvent and revitalize the AI dream; this talk introduces the approach.

Kathleen McKeown
Columbia University, USA

"Generating Multimedia Briefings: Integrating and Coordinating Multiple Media to Convey Information Concisely"

Communication can be more effective when several media (such as text, speech, or graphics) are integrated and coordinated to present information. This changes the nature of media specific generation (e.g., language generation) which must take into account the multimedia context in which it occurs. In this talk, I will present work on coordinating and integrating speech, text, static and animated 3D graphics, and stored images, as part of several systems we have developed at Columbia University. A particular focus of our work has been on the generation of presentations that *brief* a user on information of interest.

Leora Morgenstern
IBM T. J. Watson Research Center, USA

"Inheritance Comes of Age: Using Semantic Networks for Default Reasoning in Industry"

Inheritance has long been considered the stepchild of formal AI: a quick and convenient but unexciting way to model some of the more routine patterns of commonsense reasoning.

However, a simple change in the inheritance paradigm --- attaching formulas to the nodes in a network --- allows us to use semantic networks to do general default resoning. Moreover, we can retain many of the positive features of inheritance networks to solve difficult default reasoning problems in a straightforward manner. This talk presents the new paradigm and describes how it has been used for real applications in the medical insurance and life insurance industries.

Hiroshi Motoda
Osaka University, Japan

"Use of Machine Learning Techniques in Developing Intelligent Human-Computer Interfaces"

This talk will present recent results of work on a user-adaptive interface that can predict what the user wants to do next and do some relevant preprocessing. We will describe how this is made possible by inducing an appropriate user model using graph-based induction.

Nicola Muscettola, Recom Technologies, NASA Ames Research Center, USA
P. Pandu Nayak, Recom Technologies, NASA Ames Research Center, USA
Barney Pell, Caelum Research Corporation, NASA Ames Research Center, USA
Brian C. Williams, Recom Technologies, NASA Ames Research Center, USA

"The New Millennium Remote Agent: To Boldly Go Where No AI System Has Gone Before"

The New Millennium Remote Agent (NMRA) is an autonomous spacecraft control system being developed jointly by NASA Ames and JPL. It integrates constraint-based planning and scheduling, robust multi-threaded execution, model-based diagnosis and reconfiguration, and real-time monitoring and control. NMRA will control Deep Space One (DS-1), the first flight of NASA's New Millennium Program (NMP), which will launch in 1998. As the first AI system to autonomously control an actual spacecraft, NMRA will enable the establishment of a "virtual presence" in space through an armada of intelligent space probes that autonomously explore the nooks and crannies of the solar system.

Luc Steels
VUB AI Laboratory, Belgium and Sony Computer Science Laboratory, France

"The Role of Language in the Origins of Intelligence"

Experiments are reported in which a group of software and/or robotic agents are able to develop a shared set of conventions with the multi-layered structure and complexity of natural languages. The languages are grounded in the environmental and bodily experiences as perceived by the agents. It is further shown how there can be a co-evolution of language and meaning and hence a progressive build up of cognitive competence.

Richard S. Sutton
University of Massachusetts at Amherst, USA

"Reinforcement Learning: Lessons for AI"

The field of reinforcement learning has recently produced world-class applications and, as we survey in this talk, scientific insights that may be relevant to all of AI. In my view, the main things that we have learned from reinforcement learning are 1) the power of learning from experience as opposed to labeled training examples, 2) the central role of *modifiable* evaluation functions in organizing sequential behavior, and 3) that learning and planning could be radically similar.

Pascal Van Hentenryck
Brown University, USA

"Numerica: A Modeling Language for Global Optimization"

Numerica is a modeling language for stating and solving nonlinear problems over the reals. From a syntactic standpoint, Numerica makes it possible to state nonlinear problems as in textbooks or scientific papers. From a semantic standpoint, Numerica is guaranteed to locate all isolated solutions to nonlinear constraint systems and all global optima in optimization problems. From an implementation standpoint, Numerica combines methods from numerical analysis and constraint satisfaction.

PANEL PROGRAM

Munidar P. Singh, **North Carolina State University**

"The Next Big Thing!"

Many AI researchers believe that AI has made significant contributions to computing research and practice, but that these contributions are not always recognized in the rest of the computing community as coming from AI. This panel will explore the interactions between AI and other areas of computer science, and will seek to identify the next major AI contributions to the field of computing as a whole. The goals of this panel are twofold: (1) to raise awareness within the AI community of the kinds of applications that will be the most amenable to AI techniques, and (2) to identify future results coming from within AI that might be used to raise awareness of AI contributions.

VIDEOTAPE PROGRAM

As a medium, videotapes are often better suited than written papers to illuminate the efficacy of AI research, especially in the emerging and exciting areas of AI in Education, Art, Music, Entertainment, Hypermedia, 3-D Animation, Artificial Life, Network-Based tools.

If a picture is worth a thousand words, then a (3-D) movie will certainly enhance the illustration of behaviors of these systems that are based on AI principles, methods, and tools.

Recognizing this potential of video presentations to demonstrate and augment AI research results, a Video Track has been designated since IJCAI-89 to be an integral part of the Technical Programs of IJCAI Conferences.

The Video Track is designed to demonstrate the current levels of usefulness of AI tools, techniques, and methods for a variety of practical and theoretical problems arising in industrial, commercial, government, space, and educational areas.

The IJCAI-97 Video Track will serve as a forum to showcase the best AI research results through:

- special video sessions, organized and scheduled as part of the conference, giving authors an opportunity to present and briefly discuss their videos.

- abstracts of accepted videos (published in the conference proceedings); and videotapes containing the entire video program (published by IJCAI Inc.).

We look forward to your participation and contribution to the success of the IJCAI-97 Video Track.

Toyoaki Nishida,
Video Track Chair