

THE EIGHTH
NATIONAL
CONFERENCE
ON ARTIFICIAL
INTELLIGENCE

AAAI-90

Program
& Schedule

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Sponsored by the
American Association for
Artificial Intelligence

July 29, 1990 - August 3, 1990

AI On-Line

Six Companies Reveal Results of Commercial Expert System Successes

Tuesday, July 31, Room 210, Hynes Convention Center, 2:00 PM – 4:00 PM

Session organized by Chuck Williams, Founder and Chief Technical Officer, Inference Corporation and Frank Angrisani, President, Sun America Financial

■ **Moderator:** Frank Angrisani, President, Sun America Financial

This panel will review the dynamics involved in integrating expert system technology in commercial environments to solve major business problems. Panelists will share their experiences (the good and the bad) in using expert system technology to improve their organizations operations. The panel will also take a broader look at expert system technology's potential in future systems. Executives representing major corporations in the telecommunications, transportation, finance, insurance, and manufacturing industries will participate.

Each panelist will present:

- (1) a brief description of the expert system application(s) in production:
 - Business problems it solved
 - Technical approach
- (2) What benefits were achieved:
 - Financial
 - Strategic
 - Development/maintenance productivity
 - Quality
- (3) Lessons learned:
 - Management
 - Integration
 - Development methodology
 - Organizational impact
- (4) Plans for expert system technology in the future:
 - Applications types
 - Benefits sought
 - Methodology/technology to be employed

- How will it be different/same
- (5) Assessment of critical success factors:
- How they established criteria
 - Whether the system met the criteria or not
 - Approaches for measuring future system success

PANELISTS

■ **Larry Tieman**, Managing Director of Data Management/Knowledge Engineering Systems, American Airlines

American Airlines has deployed many significant expert system applications on a variety of hardware platforms from mainframes to workstations to personal computers. Two significant expert system applications and their impact on American Airlines' business and organizations will be presented.

■ **Don McKay**, Director, Logistic Systems, American President Companies
Logistics management application. Mainframe expert system responsible for assigning vessel stowage locations to move cargo between Asia and North America.

■ **Roger Jambor**, Director, Business Information Group, Dun & Bradstreet

The Credit Clearing House Expert System is responsible for providing on-line credit analysis and recommendations to manufacturers, wholesalers, and importers on businesses in the apparel industry.

■ **John Woods**, Manager of AI/Expert System Technology Development Group, Ford Motor Company
Ford has achieved several expert system application successes. One in particular, ESCAPE (Expert System for Claims Authorization and Processing), is a mainframe expert system that is used in the validation process for incoming warranty claims and replaces a major portion of an existing COBOL program. It is an excellent example of expert system technology solving a major business problem.

■ **Jim Euchner**, Supervisor of Expert System, Nynex Science & Technology
Nynex has deployed an expert system in over 40 offices throughout New England and its other service areas to handle customer telephone repair problems. It is having a dramatic impact on reducing operational costs as well as improving customer service.

■ **Rich Levine**, President, RSL Business Solutions (Independent Consultant), Sun America Financial

Sun America Financial has deployed an Appointment Expert System to provide expert advice for the corporate and individual agent appointment process in compliance with state and federal insurance licensing regulations. This expert system is a critical component in a new processing automation system that integrates image processing, PC networks, workflow management, and instantaneous MIS tracking to redefine a business operation.

Why and How Corporate America Is Integrating AI into Data Processing

Wednesday, August 1, Room 210, Hynes Convention Center, 9:00 AM – 11:00 AM

Session organized by Jack Rahaim, Manager of AI Marketing, Digital Equipment Corporation

■ **Moderator:** Don Mick, Director of Business Opportunities, Aetna Life & Casualty

This session will focus on the following three areas:

- Applications
- Architecture
- Organizational Processes

PANELISTS

■ **Ted Smith**, US West

Ted Smith will discuss the topic of applications and emphasize their organization's use of the technology. He will also discuss what applications

choices were made, why they were made, and how they were made.

■ *Rosemary Baer*, Vice President, Chemical Bank New York, Chemical Bank

Rosemary V. Baer will discuss Chemical Bank's "retail architecture" and the enabling characteristics which permit the continued integration of existing and emerging expert and conventional technologies. The discussion will include the business goals and objectives which fostered the design of this highly distributed, service-oriented environment.

■ *Paul Deschamps*, Project Manager, Aetna Life and Casualty

Paul Deschamps will emphasize organizational processes. He will talk about their organization's approach to learning, transferring and nurturing expert systems throughout semi-autonomous divisions. Mr. Deschamps will also discuss the lessons learned in applying the technology and the current status *vis a vis* original goals of this effort.

■ *Nancy Faucheux*, Information Systems Analyst, Texaco Inc.

Nancy Faucheux from Texaco Inc. will describe on-line applications of real-time advisory systems in petroleum and petrochemical operations.

What Users Are Buying Today in AI — and Why: Reports from Management

Wednesday, August 1, Room 210, Hynes Convention Center, 1:00 PM – 3:00 PM

Session organized by Keith Scovell, Manager, and Tim Holcomb, Senior Consultant, Andersen Consulting

■ *Moderator*: Roger Schelm, Vice President, Applied Research, CIGNA

Mr. Schelm is Vice President, Applied Research/Expert Systems, of

AI On-Line Schedule

Tuesday, July 31

Six Companies Reveal Results of Expert Systems Successes

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Moderator: Frank Angrisani, President, Sun America Financial

Panelists: Larry Tieman, American Airlines; Don McKay, American President Companies; Roger Jambor, Dun & Bradstreet; John Woods, Ford Motor; Jim Euchner, Nynex; Rich Levine, Sun America

Wednesday, August 1

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1:00 PM – 3:00 PM, Room 210, Hynes Convention Center

Organized by Keith Scovell and Tim Holcomb, Andersen Consulting

Moderator: Roger Schelm, Vice President Applied Research, CIGNA

Panelists: Mary Dunn, Mutual of New York; Bill Corbin, Owens Corning; Dave Wise, Frito-Lay; Mike Rogalski, Sears Merchandise Group; Troy A. Heindel, NASA-Johnson Space Center; Al Brown, Lockheed Missiles & Space Company

Developing Real-Time On-Line Applications

3:15 PM – 5:15 PM, Room 210, Hynes Convention Center.

Organized by Didi Murnane, Gensym Corporation

Moderator: Karlene A. Kosanovich, Senior Consulting Engineer, E.I. DuPont de Nemours and Company.

Panelists: Dorothy Yu, Coopers & Lybrand; Karl-Erik Arzen, Lund Institute of Technology; Gregory M. O'Connor, Massachusetts Institute of Technology; Paul D. Schoen, Rockwell International; Jean-Pierre Aubert, Alcatel ISR France

Thursday, August 2

Differentiating Expert Systems Products

9:00 AM – 11:00 AM Room 210, Hynes Convention Center

Organized by Larry Harris, AICorp and E. Robert Keller, Renaissance International

Moderator: E. Robert Keller, President, Renaissance International

Panelists: Larry Harris, AICorp; Harry C. Reinstein, Aion Corporation; Randy Raynor, Inference Corporation; Alain Rappaport, Neuron Data; Robert Moore, Gensym

AI Versus Conventional Data Processing

2:00 PM – 4:00 PM, Room 210, Hynes Convention Center

Organized by Keith Scovell and Tim Holcomb, Andersen Consulting

Moderator: Bruce B. Johnson, Director of Research and Technology Services, Andersen Consulting

Panelists: Bradley C. Billetdeaux, Exxon Company USA; Stanley Wozniak, MCI; Dave Dean, Eastman Kodak; Glen Galen, Burlington Northern Railroad Information Systems; Ed Mahler, E. I. DuPont de Nemours and Company

the Systems Division of CIGNA Corporation. He was instrumental in the launching of *Expert Systems: Planning/Implementation/Integration*, a quarterly journal published by Auerbach, a Division of Warren, Gorham & Lamont, and continues as its founding Consulting Editor. Mr. Schelm has directed the technology transfer of expert systems into CIGNA Corporation since 1983. CIGNA Corporation is one of the leading users of expert systems in the insurance industry.

This panel discussion surrounds how and why businesses are applying AI technology to specific areas within their organization, their basis for selecting and applying AI to each domain, the process of identifying opportunity areas and building a business case, the effectiveness of technology transfer within the organization, and the benefits realized as a result. Each issue will be supported by examples of how and why knowledge-based systems (KBS) applications and decision-support systems are being applied within the corporate community. In order to facilitate this discussion, the topic will begin by defining and describing AI from a commercial view, rather than an academic (or theoretical) perspective, and conclude with a review of certain key benefits realized from the development and delivery of KBSs.

Each panelist will present:

(1) a brief description of major KBS applications in production:

- Business problem(s) solved (the need)
- Development considerations / approach

(2) The key benefits realized:

- Improved workforce productivity
- Improved product/service quality
- Reduced corporate expenditures
- Reduced system development / maintenance costs

(3) Brief description of business case(s) developed:

- Success criteria/critical factors
- Key project approach
- Measuring KBS success

(4) Lessons learned:

- Development approach
- Organizational change issues
- Knowledge automated

PANELISTS

■ *Mary Dunn*, Corporate Knowledge Engineer, Mutual of New York

Mutual of New York (MONY) took advantage of KBS technology relatively early, implementing an underwriting system shell in 1987 in what might be called "first generation" expert-system shell software. This first project was a major undertaking, not cautious experimentation, and a major success. Where do you go from there, particularly in a climate of downsizing and cost cutting? Three objectives serve our goal of seeing KBS technology become a power tool on the business systems workbench. These objectives are:

- Integrate the technology into the mainstream of systems development and operations
- Integrate knowledge engineering into business systems support areas
- Integrate understanding of the technology's applicability into business areas (management and analysts)

Ms. Dunn will describe the steps taken in this "second generation" KBS phase and the lessons learned along the way.

■ *Bill Corbin*, Systems Engineer, Owens Corning

Owens Corning is the leading manufacturer in the U.S. for a wide variety of fiberglass and flaked glass products ranging from the batting used to insulate homes to fiberglass-reinforced plastic parts for refrigerators. The company uses a decision-support system that monitors a large conveyor belt that produces continuous mats of fiberglass that must meet cer-

tain quality standards, such as tensile strength and uniform size and thickness. Operating around the clock, the belt is subject to numerous mechanical failures that could affect these quality standards. Belt speed, oven temperatures, and settings for the melters must be constantly monitored and fine-tuned in order for the process to run smoothly.

The decision-support system comes into play when there is a problem. For instance, if a problem were to arise regarding the strength of the mat, the expert system would take the operator through an interview process to help determine what is causing the problem. The application runs on the Macintosh with a hypertext front-end, and shows the operator graphically exactly where to look in the machinery to find the possible source of the problem.

■ *Dave Wise*, Senior Systems Analyst, Frito-Lay

Frito-Lay is developing a knowledge-based system which can be used to make decisions by trolling through data gathered from over 10,000 hand-held computers, purchased scanner data and other internal data sources. Discussion will be centered around the development of the business case, criteria used to justify projects and problems encountered to date. Future directions include the use of analytical workbenches.

■ *Mike Rogalski*, Software Specialist, Sears Merchandise Group

Mr. Rogalski directs efforts to investigate and deploy AI technologies and knowledge-based systems for Sears Merchandise Group. His talk will outline some of the areas in which knowledge-based systems are being developed within the company, with attention paid to benefits — expected and unexpected — for the business and for the software development organization.

■ *Troy A. Heindel*, Project Manager, Real-Time Data System, NASA-Johnson Space Center

NASA is taking full advantage of AI technology, developing real-time expert systems in the Johnson Space Center Mission Control Center to assist space-shuttle flight controllers. NASA is using KBSs to address three basic goals: (1) capture of corporate knowledge of veteran flight controllers, (2) enhancement of flight controller tools, and (3) reduction in the time required to train new personnel. Mr. Heindel has experience in the design and implementation of KBSs, which support various problem domains including flight simulation, reaction control, and fault diagnosis.

■ *Al Brown*, Project Manager, Lockheed Missiles & Space Co.

Mr. Brown will use his experience with the Advanced Solid Rocket Motor project to demonstrate some positive steps to be taken in obtaining management commitment for an AI project. At Lockheed, this included putting something that was not proven and had not been done in a proposal to NASA. Mr. Brown will also discuss some of the things that should not be done when trying to sell management on AI. On the ASRM project, Lockheed had to convince all contractors involved to move AI into the mainstream of the project.

Developing Real-Time On-Line Applications

Wednesday, August 1, Room 210, Hynes Convention Center, 3:15 PM—5:15 PM

■ *Session organized by* Didi Murnane, Gensym Corporation

■ *Moderator:* Karlene A. Kosanovich, Senior Consulting Engineer, E.I. DuPont de Nemours and Company
Karlene A. Kosanovich is a senior

consulting engineer in the Artificial Intelligence in Process Control Group at DuPont. Ms. Kosanovich is actively involved in the development and implementation of real-time expert systems aimed at improving all aspects of process control.

The aim of this panel is to provide a forum in which the special needs of real-time on-line applications will be shared. Each panelist will describe their project from conceptual design to implementation. Key issues to be discussed will be lessons learned, project development and implementation barriers, and real business benefits of the technology. Each panelist will present:

- (1) A definition of their application domain
- (2) Application issues addressed
- (3) Application implementation
- (4) Key issues:
 - Problems solved by application
 - By-product benefits of application
 - In retrospect, issues that would be dealt with differently

PANELISTS

■ *Dorothy Yu*, Manager Advanced Technology Group, Coopers & Lybrand

The Coopers & Lybrand Advanced Technology Group has been using knowledge-based process modeling and simulation to improve back-office operations in the financial services industry. The C & L Process Simulator developed using the G2 Real-Time Expert System shell, is used to model, analyze, and redesign value-added activities and resource utilization as a means to facilitate and improve on-line processing.

■ *Karl-Erik Arzen*, Department of Automatic Control, Lund Institute of Technology, Sweden

The Department of Automatic Control at the Lund Institute of Technology has been working in conjunction with Asea Brown Boveri AB, and SattControl AB on the research pro-

ject, knowledge-based real-time control systems. Karl-Erik Arzen is the principal person in the Automatic Control Department on this project. Mr. Arzen's background and experience is in expert control where a real-time, blackboard-based expert-system shell has been developed and implemented. The system currently on-line is used as a part of a feedback loop containing general control knowledge and heuristics on control loop tuning, monitoring, and adaptation.

■ *Gregory M. O'Connor*, Postdoctoral Fellow, Biotechnology Process Engineering Center (BPEC), Massachusetts Institute of Technology
Mr. O'Connor's work at MIT's BPEC focuses on the use of automation technologies to improve the consistency and quality of bioprocess operations and to speed process development. He has built on-line expert systems to ensure product quality and supervise process operations. The MIT BPEC is an Engineering Center of Excellence sponsored by the National Science Foundation, to foster closer university-industry relations. The BPEC has an industrial consortium with more than 60 member companies, many of which are interested in advanced computer control of bioprocesses.

■ *Paul D. Schoen*, Project Manager Aerospace Simulation and Systems Test Center, Rockwell International
The Aerospace Simulation and Systems Test Center in Downey, California builds automatic test equipment and simulation systems like NASP (National Aerospace Plane). They have produced shuttle flight-simulation systems and are the back-up data-acquisition center for Houston's Johnson Space Center to receive in-flight shuttle data. The center is Rockwell's Center of Excellence for all simulation activities. Paul Schoen is the project manager in charge of developing ground support equipment that is utilized for data acquisition and reduction including the use of expert systems.

■ *Jean-Pierre Aubert*, Division Manager of C³I Systems, Alcatel ISR France
Jean-Pierre Aubert is Division Manager in charge of C³I systems at Alcatel ISR, Paris, France. He will present SICOCS, a communications command and control system for fighting forest fires. The systems locate teams of fire fighters, allocates resources appropriately, and maintains historical documentation of each mission. The entire system is written in SPOKE object-oriented programming language and interfaces to DOG NAPPING and Oracle.

Differentiating Expert System Products

Thursday, August 2, Room 210, Hynes Convention Center, 9:00 am – 11:00 am

■ *Session organized by* Larry Harris, Founder, AICorp and E. Robert Keller, President, Renaissance International Corporation

■ *Moderator:* E. Robert Keller, President, Renaissance International Corp. In February 1983, Mr. Keller formed Renaissance International. Its purpose is to provide support and training services, education, and products in the AI field.

Immediately prior to forming Renaissance, Mr. Keller served for three years in an executive capacity as Director of Customer Support and Relations at Artificial Intelligence Corporation. In that position, he was responsible for directing work in the areas of product planning and evaluation as well as personnel, public, and customer relations. In addition, he has spent several years as a self-employed systems consultant and teacher of both AI and structured system development.

Segment 1: Five minute introduction by the moderator outlining the issues, goals, and methods of the panel.

Segment 2: Ten minute presentations by each of the five panelists in which

they differentiate their products from the rest of the market, specifically addressing the following three areas:

- (1) Major design goals of the product
- (2) Unique functional and architectural features that differentiate the product from others
- (3) Two production applications that best illustrate the product's capabilities. Only applications that are in production use by customers are acceptable. Include the following:
 - Nature of the application
 - Specific benefits to the customer
 - Typical number of users per day, and maximum concurrent users
 - Size and nature of databases involved

Segment 3: 30 – 60 minutes of Q&A. Questions are from the audience, as well as from the moderator.

PANELISTS

■ *Larry R. Harris*, Founder, AICorp

Mr. Larry R. Harris is the founder of AICorp. He is the author of the INTELLECT natural language information system, and the chief architect of KEMS, AICorp's Knowledge Base Management System for production applications in the IBM mainframe environment. Mr. Harris is an internationally recognized authority on all aspects of AI technology, especially with regard to natural language and expert systems. During his tenure as Professor of Computer Science at Dartmouth College, he wrote the INTELLECT system. While at Dartmouth, he was also a visiting professor at the Massachusetts Institute of Technology's AI Laboratory. Mr. Harris is the author of the Bantam Book, *Artificial Intelligence Enters the Marketplace*.

■ *Harry C. Reinstein*, Aion Corporation

Harry C. Reinstein is currently the Chairman and Chief Executive Officer of Aion Corporation. In addition to being one of Aion's founders, he was president from its inception in 1984, through 1988. Prior to Aion, Mr. Reinstein was with the IBM Corpora-

tion for 23 years. Throughout his career he has been directly involved in product development and customer interaction relating to production-centered data processing. Specific projects have included operating systems, database management, application development, and expert systems.

■ *Randy Raynor*, Senior Vice President, Inference Corporation

Mr. Raynor joined Inference Corporation in July 1987. In the position of Senior Vice President, he is responsible for the development and support of all Inference products. Mr. Raynor came to Inference with over twelve years experience in management of major software organizations. Prior to joining Inference, Mr. Raynor was Vice President, Product Development for Computer Associates (formerly UCCEL), where he managed the organization responsible for developing products for the company's business application division. Prior to Computer Associates, he was with Texas Instruments where he held various management positions in development of computer-aided software engineering tools (IEF) as well as business and engineering applications.

■ *Alain Rappaport*, President, Chief Scientist, Neuron Data

Mr. Rappaport is responsible for the design of NEXPERTOBJECT reasoning technology. Prior to cofounding Neuron Data, he was a researcher in AI and machine learning at the Robotics Institute at Carnegie-Mellon University.

■ *Robert Moore*, President, Gensym

Mr. Moore, along with five other members of Gensym, founded the company in September 1986. The company was founded to develop and market a new generation of expert system products—products that would provide capabilities for real-time data for time-critical applications. Mr. Moore has been the author of several articles on real-time expert systems and has presented numerous papers at AAAI and ISA.

AI Versus Conventional Data Processing

Thursday, August 2, Room 210, Hynes
Convention Center, 2:00 PM – 4:00 PM

Session organized by Keith Scovell,
Manager, and Tim Holcomb, Senior
Consultant, Andersen Consulting

■ *Moderator:* Bruce B. Johnson, Direc-
tor of Research and Technology Ser-
vices, Andersen Consulting

Mr. Johnson is Director of the Center
for Strategic Technology and Research.
He founded Andersen Consulting's AI
practice in 1982. Mr. Johnson is ac-
tively involved in the research and de-
velopment of knowledge-based appli-
cations, distributed decision-making
platforms, and integrated human-
computer information systems.

This panel will provide an intelli-
gent comparison between AI and
conventional data-processing tech-
nologies as they relate to providing
solutions to major business prob-
lems. During this session, each pan-
elist will share their experiences and
views on the two approaches and
support their beliefs with example
KBS applications. The session will
cover such topics as assessing busi-
ness opportunities, building a case
for AI/conventional DP, and key ben-
efits expected. Each issue will be sup-
ported by examples of how and why
AI/conventional DP is applied to cor-
porate business problems. Each pan-
elist will present:

(1) Brief description of major KBS sys-
tems in use:

- Business problem(s) solved
- Reason for the selection of an AI
solution

(2) Comparison of AI versus conven-
tional data-processing approaches:

- Automation opportunities
- Development methodologies
- Examples of current conventions /
systems which are solid candidates
for AI applications.

(3) Key benefits achieved:

- Reduction in system maintenance
costs
 - Reduction in development time-
frame
 - Improved operating efficiencies
- (4) Architectures for integration

PANELISTS

■ *Bradley C. Billetdeaux*, Senior Sys-
tems Analyst, Information and Com-
munications Systems Department,
Exxon Company, USA

Mr. Billetdeaux's team provides con-
sulting and development services for
ICBS and operations research applica-
tions. Integration and maintainabili-
ty are issues when considering
knowledge-based systems (KBS) for
applications development. At Exxon
Company, USA, the experience incor-
porating three KBS modules within a
material inventory system provided
valuable insight on how to address
these issues. Procedures for cost esti-
mating, staffing, performance, and
mainframe performance help to
ensure that the potential benefits
from using KBS are captured.

■ *Stanley Wozniak*, Manager, Knowl-
edge Based Systems Department, MCI
Communications Corporation

Mr. Wozniak's organization is respon-
sible for applying advanced tech-
nologies to support MCI's strategic
business objectives. Currently the
KBS Department focuses its efforts on
building intelligent front-ends to
complex database applications in the
sales and marketing, and the order-
entry areas of MCI's business. Other
projects include integrated network
alarm management, strategic busi-
ness modeling, and intelligent and
integrated application environments.

Mr. Wozniak will discuss how his
department is designing and integrat-
ing an AI-based software develop-
ment life-cycle into a traditional one,
MCI's corporate systems develop-
ment methodology (CSDM).

■ *Dave Dean*, Systems Engineer, AI
Lab Coordinator, Eastman Kodak
The Eastman Kodak Company is utiliz-

ing a knowledge-based system
approach to solving problems in
many areas. Virtually hundreds of
decision-tree based expert systems are
in place, used by technicians to diag-
nose manufacturing machine related
problems. Expert systems have been
installed where conventional
approaches were unsuccessful, such as
in a warehouse picking operation, or
installed in addition to a convention-
al approach, such as a product selec-
tion advisor that takes advantage of
an existing mainframe database sys-
tem. Kodak has experience in expert
systems on a wide range of hardware /
software platforms, as well as experi-
ence in other advanced computing
technologies such as neural networks,
object-oriented systems, and intelli-
gent human/machine interfaces.

■ *Glen Galen*, Manager—AI Systems,
Burlington Northern Railroad Infor-
mation Systems

Burlington Northern Railroad has been
involved in the development of artifi-
cial intelligence-based systems since
April 1986, when Mr. Galen joined the
corporation. A number of expert sys-
tems are now in use, running on both
personal computers and engineering
workstations. These fielded applica-
tions are in marketing, operations,
accounting, and human resources.
Burlington Northern also uses the
mainframe-based AI tools, KBMS, and
INTELLECT, and has developed proto-
type applications using that software.

■ *Ed Mahler*, Manager, Decision Sup-
port Systems and Artificial Intelli-
gence, E. I. DuPont De Nemours & Co.
Mr. Mahler's organization is respon-
sible for evaluating and applying deci-
sion-support technologies to support
E. I. DuPont's corporate vision. E. I.
DuPont has successfully fielded a
number of AI/KBSs in a variety of
fields. His discussion will center
around business decision flow mod-
els: the role of transaction systems,
decision-support systems, knowl-
edge-based systems, and models in
the decision-making process.

General Information

Admission

Each conference attendee will receive a name badge upon registration. This badge is required for admittance to the technical, tutorial, exhibit, and workshop programs. Admittance to the tutorials is by TICKET ONLY.

SMOKING, DRINKING, AND EATING ARE NOT ALLOWED IN ANY OF THE TECHNICAL, TUTORIAL, OR EXHIBIT SESSIONS.

Baggage Claim

There will be a baggage claim/check area at the Plaza level, Main Lobby in the Hynes Convention Center operated by ARA Leisure Services. Neither the AAAI nor the Hynes Convention Center accept liability for the loss or theft of any suitcase, briefcase, or other personal belongings brought to the site of AAAI-90.

Banking/Currency Exchange

The closest full service bank to the Hynes Convention Center is the Bank of Boston located on Prudential Plaza; the phone number is (617) 267-5261. Deak International provides currency exchange services at their location, 800 Boylston Street in the Prudential Plaza. Their hours are Monday—Friday 8:30 AM – 4:30 PM; Saturday 10:00 AM – 5:00 PM; Sunday 10:00 AM – 2:00 PM.

Child Care

Personal Touch provides child-care services in your hotel room. Cost is \$12.00 per hour for 1-3 children with a minimum of four (4) hours. Arrangements can be made to have the charges added to your hotel bill. Contact (617) 423-2556 for further details.

Coffee Breaks

Coffee breaks for the Technical Sessions will be held in the Hynes Convention Center, Boylston Street Hall, Level 2 and 3.

Conference Program Schedule

The program schedule begins on page A-14.

Copiers

The closest copying centers to the Hynes Convention Center are Sir Speedy at 827 Boylston Street, (617) 267-9711 (Hours: M – F, 8:30 AM – 5:00 PM; Sat., 10:00 AM – 5:00 PM), and Copy Cop at 815 Boylston Street, (617) 267-9267 (Hours: M – F 7:30 AM – 11:00 PM; Sat. 8:30 AM – 6:00 PM; Sun 12:00 PM – 8:00 PM).

Digital Equipment Video

An educational video about innovation in AI aimed at the secondary school level will be demonstrated in Room 312 of the Hynes Convention Center. It will be shown continuously Wednesday and Thursday, August 1-2 from 8:30 AM – 6:00 PM.

Exhibit Entrance

Conference attendees must be wearing their conference registration or exhibitor badge to enter the Exhibition or AI On-Line. Vendor-issued guest passes must be redeemed at the registration desk in Hall B. Further information regarding access to the Exhibition can be obtained from the Exhibitor Information Desk in front of Exhibition Hall C.

Exhibit Program

An important service to conference attendees is the Exhibit Program, to be held Tuesday, July 31 through Thursday, August 2. Hardware and software manufacturers, publishers, universities, and nonprofit organizations involved in artificial intelligence will display and demonstrate their current products, services, or research.

Once again AAAI has given complimentary booths to university and nonprofit research organizations to demonstrate current AI research. The AAAI would like to thank the major computer equipment suppliers for

donating equipment and technical support toward this demonstration program.

LOCATION

Hynes Convention Center, Hall C & D

EXHIBIT HOURS

Tuesday: 12:00 PM – 7:00 PM
Wednesday: 10:00 PM – 6:00 PM
Thursday: 10:00 PM – 5:00 PM

Exhibitors

The *AI Review* has a complete list of exhibitors, booth locations, and outline of products, services or research efforts. In addition, there are short articles submitted by exhibitors discussing technical aspects of their products or services. Extra copies of this review are available at the Exhibitor Information Desk.

Food Outlets

There is a cafeteria in the Hynes Convention Center, on the Plaza level, main corridor. It will be open during the conference.

Handicapped Facilities

The Hynes Convention Center and the Marriott Copley Place Hotel both have handicapped facilities. The Hynes Convention Center has elevators located in the North and South Rotundas connecting all three floors.

Information Desk

An information desk will be staffed during registration hours, Sunday through Friday, July 29 – August 3.

List of Attendees

A list of preregistered attendees of the conference will be available for review at the Registrar's Desk in the Hynes Convention Center, Hall B. Attendee lists will NOT be distributed.

Message Center

A message desk will be manned in the Hynes Convention Center, Hall B, during registration hours, and mes-

sage terminals for sending and retrieving messages are located in Halls B, C, and D. The telephone number for leaving messages only is (617) 954-3333.

THERE IS NO MEANS OF PAGING CONFERENCE ATTENDEES. All phone messages can be retrieved from any message terminal in Hall B during registration hours or at the message terminals in the Exhibit Hall during exhibit hours. There will be no access to message terminals after hours. We suggest that hotel phone numbers be used as primary contact points.

Parking

Paid lots are available under the Prudential Towers adjacent to the Hynes Convention Center for \$14.00 per day and on Dalton Street across from the Sheraton at the Cheri Lot for \$10.00 per day.

Press

All members of the media are requested to register in the Press Room on the Plaza Level of the Hynes Convention Center, Room 108. Press badges will only be issued to individuals with approved credentials. The Press Room will be open for advance registration on Sunday, July 29 at 12:00 PM. During the conference the Press Room will be open during the following hours:

Sunday, July 29: 12:00 PM—5:00 PM
Monday, July 30: 8:00 AM—5:00 PM
Tuesday, July 31: 8:00 AM—5:00 PM
Wednesday, August 1: 8:00 AM—5:00 PM
Thursday, August 2: 8:00 AM—5:00 PM
Friday, August 3: 8:00 AM—11:00 AM

A representative from the AAAI will be on duty during press-room hours to assist the members of the press and media.

Press Conference

A Press Lunch and Conference will be held on Tuesday, July 31, at 12:00 PM in Room 208 of the Hynes Convention Center.

Proceedings

Each registrant for the technical program will receive a ticket with the registration materials for one copy of the conference proceedings. The ticket may be redeemed at The MIT Press Proceedings counter, located in the Hynes Convention Center, Hall B, during registration hours, or at the AAAI Press / The MIT Press booth #306, located in Hall C, during exhibit hours. Proceedings can also be redeemed by mailing the ticket with your name and address to the MIT Press, 55 Hayward, Cambridge, MA 02142.

Extra proceedings may be purchased at the conference site at the above locations. THURSDAY, AUGUST 2, WILL BE THE LAST DAY TO PURCHASE EXTRA COPIES OF THE PROCEEDINGS AT THE CONFERENCE SITE. Proceedings are also available at The MIT Press bookstore in Cambridge, MA.

Public Telephones

Pay telephones are located on all levels of the Hynes Convention Center and the Marriott Copley Place Hotel.

Recording

No audio or video recording is allowed in the TUTORIALS. Tapes of TECHNICAL sessions will be for sale in Hall B, Hynes Convention Center. A representative from First Tape Inc. will be available to take your order during regular registration hours, beginning Tuesday, July 31. Order forms are included with registration materials. Tapes may also be ordered by mail from

First Tape Incorporated
730 North LaSalle Street, Suite 200
Chicago, Illinois 60610.

Registration

Conference registration will take place in the Hynes Convention Center, Hall B, beginning Sunday July 29.

Registration hours are:

Sunday, July 29: 7:30 AM—6:00 PM
Monday, July 30: 7:30 AM—6:00 PM
Tuesday, July 31: 7:30 AM—6:00 PM
Wednesday, August 1: 7:30 AM—6:00 PM
Thursday, August 2: 7:30 AM—6:00 PM
Friday, August 3: 7:30 AM—11:30 AM

Only checks drawn on US banks, VISA, Mastercard, government purchase orders, and travelers' checks for US currency will be accepted. We cannot accept foreign currency or checks drawn on foreign banks.

Speakers Ready Rooms

Speakers Ready Rooms will be located on the second floor, Room 205 of the Hynes Convention Center. This room will have audio-visual equipment to assist speakers with their preparations. It is important that speakers utilize this room to organize their materials. The room will be open during the following hours: 8:00 AM – 5:00 PM Sunday, July 29 through Thursday, August 2, and 8:00 AM – 10:30 AM on Friday.

Invited Speakers are asked to come to Room 111 one day prior to their speech. Room 111 is located on the First Level of the Hynes Convention Center and the audio-visual team will be there from 9:00 AM – 12:00 PM every day.

T-Shirt Sales

T-shirts will be for sale in Hall B, Hynes Convention Center, during registration hours. Supplies are limited.

Transportation

Custom Travel Consultants, the AAAI-90 travel agent, will be staffing the Transportation Desk in the Hynes Convention Center, Hall B, to assist with changes in travel plans.

Air

Northwest Airlines and Trans World Airlines (TWA) have been selected as official co-carriers for AAAI-90. If you wish to change your reservation, you may call Northwest directly at (800) 328-1111, and TWA directly at (800) 325-4933. Please remember to provide the AAAI-90 Conference Code number (NW) 17379, (TWA) B9912829 when you make your arrangements.

Ground Transportation in Boston

The Massachusetts Bay Transportation Authority, commonly called "The T," services most of Boston. Hynes Conference Center can be reached by taking the Green Line to the Prudential or Auditorium stations. Cost at press time was \$0.75 for one direction.

Tutorial Syllabi

AAAI-90 Tutorial syllabi will NOT be available after tutorials.

Volunteer Room

Volunteer Headquarters, located on the Plaza Level of the Hynes Convention Center in Room 107, will be open Saturday, July 28.

Special Meetings

AAAI Annual Business Meeting

The Annual Business Meeting will be held Wednesday, August 1, from 12:45 PM – 1:15 PM in the Hynes Auditorium.

AAAI Conference Committee Meeting

The AAAI Conference Committee breakfast meeting will be held Tuesday, July 31, at 7:30 AM in Room 300 (the Board Room), Level Three of the Hynes Convention Center.

AAAI Executive Council Meeting

The Executive Council Meeting will be held Monday, July 30, from 8:30 PM – 5:00 PM, in Room 300 (the Board Room), Level Three of the Hynes Convention Center.

AAAI Press Editorial Board Meeting

The AAAI Press Editorial Board will meet Wednesday, August 1, at 1:20 PM in Room 300 (the Board Room), Level Three of the Hynes Convention Center.

AAAI Publication Committee Meeting

The AAAI Publication Committee breakfast meeting will be held Thursday, August 2, at 7:30 AM in Room 300 (the Board Room), Level Three of the Hynes Convention Center.

AI in Business Subgroup Meeting

The AI in Business Subgroup Meeting will be held Tuesday, July 31, from 12:45 PM – 1:30 PM in Room 302 of the Hynes Convention Center.

AI in Law Subgroup Meeting

The AI in Law Subgroup Meeting will be held Thursday, August 2, from 12:45 PM – 1:30 PM in Room 302 of the Hynes Convention Center.

AI in Manufacturing Subgroup Meeting

The AI in Manufacturing Subgroup Meeting will be held Thursday, August 2, at 12:45 PM – 1:30 PM in Room 304/6 of the Hynes Convention Center.

AI in Medicine Subgroup Meeting

The AIM Subgroup Meeting will be held Tuesday, July 31, from 12:45 PM – 1:30 PM in Ballroom C of the Hynes Convention Center.

AI Journal Editorial Board Meeting

The *Artificial Intelligence Journal* Editorial Board breakfast meeting will be held Wednesday, August 1, at 7:00 AM in the Vineyard Room, Level Four, Marriott Copley Place.

IJCAI Trustee's Meeting

The IJCAI Trustee's Meeting will be held Friday, August 2, from 8:00 AM – 6:00 PM in the Vineyard Room, Level Four, Marriott Copley Place.

Planning Meeting

The *Knowledge Discovery in Databases* Planning Meeting will be held Thursday, August 2, in Hynes Convention Center, Room 208, from 10:00 AM – 12:30 PM. (Gregory Pietetsky-Shapiro.)

Press Lunch and Conference

A Press Lunch and Conference will be held Tuesday, July 31, at 12:00 PM in Room 208 of the Hynes Convention Center.

SIGART Meeting

The SIGART Meeting will be held Tuesday, July 31, from 12:45 PM – 1:30 PM in Room 304/6 of the Hynes Convention Center.

Alternative Activities

Tuesday—Open Suite

Initiative for Managing Knowledge Assets, Tuesday, July 31, 2:00 PM – 4:00 PM, Sheraton Boston Hotel, Suite 507/508. Jennifer Oshin, Carnegie Group

Wednesday—Open Suite

Initiative for Managing Knowledge Assets, Wednesday, August 1, 2:00 PM – 4:00 PM, Sheraton Boston Hotel, Suite 507/508. Jennifer Oshin, Carnegie Group

Wednesday—Franz Forum

Birds of a Feather Session—User group meeting/open discussion for the Franz product line including Allegro Common LISP and future products. Technical developers will be on hand. Wednesday, August 1, 3:00 PM – 4:00 PM, Hynes Convention Center, Room 208

Thursday—Open Suite

Initiative for Managing Knowledge Assets, Thursday, August 2, 2:00 PM – 4:00 PM, Sheraton Boston Hotel, Suite 507/508. Jennifer Oshin, Carnegie Group

Fourth Floor Map, Boston Marriot Copley-Place

Program

Sunday, July 29

Conference Registration

7:30 AM – 6:00 PM, Hall B, Hynes

◆Tutorial Program

2:00 PM – 6:00 PM

Tutorial SP1: Basic Theory of Neural Networks

Geoffrey Hinton and Michael Jordan
2:00 PM—6:00 PM, Ballroom B, Hynes

Tutorial SP2: Designing Natural Language Interfaces

Edwin Addison and Paul Nelson
2:00 PM—6:00 PM, Room 304/6, Hynes

Tutorial SP3: Model-Based Diagnosis

Walter Hamscher and Peter Strauss
2:00 PM—6:00 PM, Room 302, Hynes

Tutorial SP4: Constraint Reasoning: Theory and Applications

Sanjay Mittal and Bernard Nadel
2:00 PM—6:00 PM, Ballroom A, Hynes

Tutorial SP5: Distributed Artificial Intelligence

Les Gasser and Jeffrey Rosenschein
2:00 PM—6:00 PM, Ballroom C, Hynes

Monday, July 30

Conference Registration

7:30 AM – 6:00 PM, Hall B, Hynes

AAAI Executive Council Meeting

8:30 AM – 5:00 PM, Room 300, Hynes

◆Tutorial Program

9:00 AM – 6:00 PM

Tutorial MA1: Applying Neural Network Technologies

David Touretzky and Yann Le Cun
9:00 AM – 1:00 PM, Ballroom A, Hynes

Tutorial MA2: Real-Time Knowledge-Based Systems

Thomas Laffey, Cynthia Pickering, and N. S. Sridharan
9:00 AM – 1:00 PM, Ballroom C, Hynes

Tutorial MA3: Current Approaches to Natural Language Semantics

Graeme Hirst and Chrysanne DiMarco
9:00 AM – 1:00 PM, Room 302, Hynes

Tutorial MA4: Developing and Managing Expert Systems in Business and Industry

David Prerau and Earl Sacerdoti
9:00 AM – 1:00 PM, Ballroom B, Hynes

Tutorial MA5: Truth Maintenance Systems

Ken Forbus and Johan de Kleer
9:00 AM – 1:00 PM, Room 304/6, Hynes

Tutorial MP1: Principles and Practice of Knowledge Acquisition

Thomas Gruber and Mark Musen
2:00 PM – 6:00 PM, Ballroom C, Hynes

Tutorial MP2: Introduction to Hypertext and Hypermedia

Jakob Nielsen and Gerhard Fischer
2:00 PM – 6:00 PM, Ballroom B, Hynes

Tutorial MP3: Evaluating Knowledge Engineering Tools

Tod Loofbourrow and Randy Davis
2:00 PM – 6:00 PM, Room 304/6, Hynes

Tutorial MP4: Building Blackboard Applications

Daniel Corkill and Rajendra Dodhiawala
2:00 PM – 6:00 PM, Ballroom A, Hynes

Tutorial MP5: Case-Based Reasoning

Janet Kolodner and Chris Riesbeck
2:00 PM – 6:00 PM, Room 302, Hynes

Tuesday, July 31

Conference Registration

7:30 AM – 6:00 PM, Hall B, Hynes

AAAI Conference Committee Meeting

7:30 AM, Room 300, Hynes

▲Plenary Addresses

8:30 AM – 10:30 AM, Hynes Auditorium

Introduction

Raj Reddy, Past President, AAI

AAAI Presidential Address: "Dimensions of Interaction"

Daniel G. Bobrow, Xerox Palo Alto Research Center

Why Is It So Hard Moving AI to Reality?

Invited Speaker: Samuel Fuller, Vice President, Research, Digital Equipment Corporation

Break

10:30 AM – 11:00 AM

◆Invited Talk

11:00 AM – 12:40 PM, Hynes Auditorium

The Future of Knowledge Representation

Speaker: Ronald J. Brachman, AT&T Bell Laboratories

Knowledge Representation (KR) has traditionally been thought of as the heart of AI. Anyone who has ever built an expert system, a natural language system—almost any AI system at all—has had to tackle the problem of representing its knowledge of the world. Despite its ubiquity, for most of AI's history KR has been a backstage activity. But in the 1980s it emerged as a field unto itself, with its own burgeoning literature and its own conference. Along with this growth, the last decade has seen major changes in KR methodology, many important technical contributions, and some dramatic challenges to the basic assumptions of the field. We will survey some of these developments, and then speculate about some of the equally interesting changes that appear on the horizon. We will also

look at some of the critical problems facing KR research in the near future, both technical and sociological.

■ Technical Sessions

11:00 AM – 12:40 PM

Automated Reasoning: Distributed and Parallel Systems

Session Chair: Tom Dean

11:00 AM – 12:40 PM, Ballroom A, Hynes

A Hierarchical Protocol for Coordinating Multiagent Behaviors

Edmund H. Durfee and Thomas A.

Montgomery, University of Michigan

11:00 AM – 11:25 AM, Ballroom A, Hynes

An Organizational Approach to Adaptive Production Systems

Toru Ishida and Makoto Yokoo, NTT

Communications and Information Processing Laboratories; Les Gasser,

University of Southern California

11:25 AM – 11:50 AM, Ballroom A, Hynes

A Parallel Asynchronous Distributed Production System

James G. Schmolze and Suraj Goel,

Tufts University

11:50 AM – 12:15 PM, Ballroom A, Hynes

The Design of a Marker Passing Architecture for Knowledge Processing

Wing Lee and Dan Moldovan,

University of Southern California

12:15 PM – 12:40 PM, Ballroom A, Hynes

Machine Learning: Knowledge-Based Inductive Learning I

Session Chair: Devika Subramanian

11:00 AM – 12:40 PM, Ballroom B, Hynes

On Analytical and Similarity-Based Classification

Marc Vilain, Phyllis Koton, and Melissa

P. Chase, The MITRE Corporation

11:00 AM – 11:25 AM, Ballroom B, Hynes

Learning from Textbook Knowledge: A Case Study

William W. Cohen, Rutgers University

11:25 AM – 11:50 AM, Ballroom B, Hynes

Changing the Rules: A Comprehensive Approach to Theory Refinement

Dirk Ourston and Raymond J. Mooney,

University of Texas

11:50 AM – 12:15 PM, Ballroom B, Hynes

Theory Reduction, Theory Revision, and Retranslation

Allen Ginsberg, AT&T Bell Laboratories

12:15 PM – 12:40 PM, Ballroom B, Hynes

Qualitative Reasoning: Reasoning with Multiple Models

Session Chair: Brian Falkenhainer

11:00 AM – 12:40 PM, Ballroom C, Hynes

Qualitative Reasoning with Microscopic Theories

Shankar A. Rajamoney and Sang Hoe

Koo, University of Southern California

11:00 AM – 11:25 AM, Ballroom C, Hynes

Shifting Ontological Perspectives in Reasoning about Physical Systems

Zheng-Yang Liu and Arthur M. Farley,

University of Oregon

11:25 AM – 11:50 AM, Ballroom C, Hynes

Approximation Reformulations

Daniel Weld, University of Washington

11:50 AM – 12:15 PM, Ballroom C, Hynes

Finding the Average Rates of Change in Repetitive Behavior

Alexander Yeh,

Massachusetts Institute of Technology

12:15 PM – 12:40 PM, Ballroom C, Hynes

Cognitive Modeling: Case-Based Reasoning

Session Chair: Kevin Ashley

11:00 AM – 12:40 PM, Room 304/6, Hynes

Distributed Cases for Case-Based Reasoning: Facilitating Use of Multiple Cases

Michael Redmond, Georgia Institute of

Technology

11:00 AM – 11:25 AM, Room 304/6, Hynes

Integrating Planning and Acting in a Case-Based Framework

Kristian J. Hammond and Timothy

Converse, University of Chicago

11:25 AM – 11:50 AM, Room 304/6, Hynes

A Method of Calculating the Measure of Salience in Understanding Metaphors

Makoto Iwayama, Takenobu Tokunaga,

and Hozumi Tanaka,

Tokyo Institute of Technology

11:50 AM – 12:15 PM, Room 304/6, Hynes

Validated Retrieval in Case-Based Reasoning

Evangelos Simoudis and James Miller,

Brandeis University and Digital

Equipment Corporation

12:15 PM – 12:40 PM, Room 304/6, Hynes

■ Exhibits

12:00 PM – 7:00 PM, Hall C & D, Hynes

Press Lunch and Conference

12:00 PM, Room 208, Hynes

Lunch

12:40 PM – 2:00 PM

Subgroup Meetings

12:45 PM – 1:30 PM

AI in Business Subgroup Meeting

12:45 PM – 1:30 PM, Room 302, Hynes

AI in Medicine Subgroup Meeting

12:45 PM – 1:30 PM, Ballroom C, Hynes

SIGART Meeting

12:45 PM – 1:30 PM, Room 304/6, Hynes

■ AI-On-Line

2:00 PM – 4:00 PM, Room 210, Hynes

Six Companies Reveal Results of Expert Systems Successes

Organized by Chuck Williams, Infer-

ence Corporation and Frank Angrisani,

Sun America Financial. *Moderator:*

Frank Angrisani, President, Sun Ameri-

ca Financial. *Panelists:* Larry Tieman,

American Airlines; Don McKay, Ameri-

can President Companies, Roger Jam-

bor, Dun & Bradstreet; John Woods,

Ford Motor; Jim Euchner, Nynex; Rich

Levine, Sun America

◆Invited Panel

2:10 PM – 3:50 PM, Hynes Auditorium

AI & Software Engineering— Will the Twain Ever Meet?

Moderator: Robert Balzer, University of Southern California-ISI. *Panelists:* Richard Fikes, Price Waterhouse; Mark Fox, Carnegie Mellon University; John McDermott, Digital Equipment Corporation; Elliot Soloway, University of Michigan

■ Technical Sessions

2:10 PM – 3:50 PM

Natural Language: Discourse

Session Chair: Cecile Paris

2:10 PM – 3:50 PM, Ballroom A, Hynes

PRAGMA—A Flexible Bidirectional Dialogue System

John M. Levine, Univ. of Cambridge
2:10 PM – 2:35 PM, Ballroom A, Hynes

Accent and Discourse Context: Assigning Pitch Accent in Synthetic Speech

Julia Hirschberg, AT&T Bell Laboratories
2:35 PM – 3:00 PM, Ballroom A, Hynes

Structure of Perspectivity: A Case of Japanese Reflexive Pronoun “zibun”

Yasuhiro Katagiri, NTT Basic
Research Laboratories
3:00 PM – 3:25 PM, Ballroom A, Hynes

Logical Task Modeling for Man-Machine Dialogue

M. D. Sadek, Centre National d'Etudes
des Télécommunications
3:25 PM – 3:50 PM, Ballroom A, Hynes

Machine Learning: Connectionist Methods

Session Chair: Doug Fisher

2:10 PM – 3:50 PM, Ballroom B, Hynes

Refinement of Approximate Domain Theories by Knowledge- Based Artificial Neural Networks

Geoffrey G. Towell, Jude W. Shavlik,
and Michiel O. Noordewier, University
of Wisconsin

2:10 PM – 2:35 PM, Ballroom B, Hynes

Empirical Studies on the Speed of Convergence of Neural Network Training Using Genetic Algorithms

Hiroaki Kitano, Carnegie Mellon Univ.
2:35 PM – 3:00 PM, Ballroom B, Hynes

A Hybrid Connectionist, Symbolic Learning System

Lawrence O. Hall and Steve G.
Romaniuk, University of South Florida
3:00 PM – 3:25 PM, Ballroom B, Hynes

Explaining Temporal-Differences to Create Useful Concepts for Evaluating States

Richard C. Yee, Sharad Saxena, Paul E.
Utgoff, and Andrew G. Barto,
University of Massachusetts
3:25 PM – 3:50 PM, Ballroom B, Hynes

Knowledge Representation: Causality and Introspection

Session Chair: Peter Ladkin

2:10 PM – 3:50 PM, Ballroom C, Hynes

Causal Theories for Nonmonotonic Reasoning

Hector Geffner, IBM T. J. Watson
Research Center
2:10 PM – 2:35 PM, Ballroom C, Hynes

A Circumscriptive Theory for Causal and Evidential Support

Eunok Paek, Stanford University
2:35 PM – 3:00 PM, Ballroom C, Hynes

A Formal Theory of Multiple Agent Nonmonotonic Reasoning

Leora Morgenstern, IBM T. J. Watson
Research Center
3:00 PM – 3:25 PM, Ballroom C, Hynes

Decidable Reasoning in First- Order Knowledge Bases with Perfect Introspection

Gerhard Lakemeyer, Univ. of Toronto
3:25 PM – 3:50 PM, Ballroom C, Hynes

Automated Reasoning: Truth Maintenance Systems

Session Chair: Jon Doyle

2:10 PM – 3:50 PM, Room 304/6, Hynes

Exploiting Locality in a TMS

Johan de Kleer, Xerox Palo Alto
Research Center
2:10 PM – 2:35 PM, Room 304/6, Hynes

Computing Stable Models by Using the ATMS

Kave Eshghi, Hewlett-Packard
Laboratories

2:35 PM – 3:00 PM, Room 304/6, Hynes

Computing the Extensions of Autoepistemic and Default Logics with a Truth Maintenance System

Ulrich Junker, GMD; Kurt Konolige,
SRI International

3:00 PM – 3:25 PM, Room 304/6, Hynes

Maintaining Consistency in a Stra- tified Production System Program

Louisa Raschid, University of Maryland
3:25 PM – 3:50 PM, Room 304/6, Hynes

Break

3:50 PM – 4:40 PM

◆Invited Talk

4:40 PM – 6:20 PM, Hynes Auditorium

Probably Approximately Correct Learning

Speaker: David Haussler, University of
California at Santa Cruz

This talk surveys recent theoretical results on the efficiency of machine learning algorithms. The main tool described is the notion of Probably Approximately Correct (PAC) learning, introduced by Valiant in 1984. In the first part of the talk, PAC learning is defined and some examples and simple theorems are given. In the second part, recent extensions and modifications of this model are outlined. These include distribution specific results, learning with queries, noise models, learning multi-valued functions (including real and vector-valued functions), and incremental learning.

■ Technical Sessions

4:40 PM – 6:20 PM

Automated Reasoning: Dis- tributed Artificial Intelligence

Session Chair: Bruce D'Ambrosio

4:40 PM – 6:20 PM, Ballroom A, Hynes

On Acting Together

Hector J. Levesque and José H. T.
Nunes, University of Toronto; Philip R.
Cohen, SRI International

4:40 PM – 5:05 PM, Ballroom A, Hynes

Distributed Truth Maintenance
David Murray Bridgeland and Michael N. Huhns, Microelectronics and Computer Technology Corporation
5:05 PM – 5:30 PM, Ballroom A, Hynes

DARES: A Distributed Automated REasoning System
S. E. Conry, D. J. MacIntosh and R. A. Meyer, Clarkson University
5:30 PM – 5:55 PM, Ballroom A, Hynes

Negotiation and Conflict Resolution in Non-Cooperative Domains
Gilad Zlotkin and Jeffrey S. Rosenschein, Hebrew University
5:55 PM – 6:20 PM, Ballroom A, Hynes

Knowledge Acquisition and Expert Systems Design Methodologies
Session Chair: Ramesh Patil
4:40 PM – 6:20 PM, Ballroom B, Hynes

Establishing the Coherence of an Explanation to Improve Refinement of an Incomplete Knowledge Base
Young-Tack Park and David C. Wilkins, University of Illinois
4:40 PM – 5:05 PM, Ballroom B, Hynes

An Experiment in Direct Knowledge Acquisition
Peter W. Mullarkey, Schlumberger Laboratory for Computer Science
5:05 PM – 5:30 PM, Ballroom B, Hynes

A Design Based Approach to Constructing Computational Solutions to Diagnostic Problems
D. Volovik, I. A. Zaulkernan, P. E. Johnson, University of Minnesota; C. E. Matthews, IBM Corporation
5:30 PM – 5:55 PM, Ballroom B, Hynes

Parametric Engineering Design Using Constraint-Based Reasoning
Niall Murtagh and Masamichi Shimura, Tokyo Institute of Technology
5:55 PM – 6:20 PM, Ballroom B, Hynes

Knowledge Representation: Temporal and Spatial Reasoning

Session Chair: Reid Simmons
4:40 PM – 6:20 PM, Ballroom C, Hynes

Reasoning about Qualitative Temporal Information
Peter van Beek, University of Waterloo
4:40 PM – 5:05 PM, Ballroom C, Hynes

Weak Representations of Interval Algebras
Gérard Ligozat, Université Paris XI
5:05 PM – 5:30 PM, Ballroom C, Hynes

A Qualitative Model for Space
Amitabha Mukerjee and Gene Joe, Texas A&M University
5:30 PM – 5:55 PM, Ballroom C, Hynes

Solving Geometric Constraint Systems
Glenn A. Kramer, University of Sussex and Schlumberger Laboratory for Computer Science
5:55 PM – 6:20 PM, Ballroom C, Hynes

Automated Reasoning: Search
Session Chair: Richard Korf
4:40 PM – 6:20 PM, Room 304/6, Hynes

Path-Focused Duplication: A Search Procedure for General Matings
Sunil Issar, Carnegie Mellon University
4:40 PM – 5:05 PM, Room 304/6, Hynes

Consistent Linear Speedups to a First Solution in Parallel State-Space Search
Vikram A. Saletore and L. V. Kalé, Univ. of Illinois at Urbana-Champaign
5:05 PM – 5:30 PM, Room 304/6, Hynes

Iterative Broadening
Matthew L. Ginsberg and William D. Harvey, Stanford University
5:30 PM – 5:55 PM, Room 304/6, Hynes

Search Lessons Learned from Crossword Puzzles
Matthew L. Ginsberg, Michael Frank, Michael P. Halpin, and Mark C. Torrance, Stanford University
5:55 PM – 6:20 PM, Room 304/6, Hynes

Reception
7:00 PM – 9:00 PM, Marriott Grand Ballroom

Wednesday, August 1

Conference Registration
7:30 AM – 6:00 PM, Hall B, Hynes

The Artificial Intelligence Journal Editorial Board
7:00 AM, Vineyard Room, Marriott Copley Place

◆ **Invited Talk**
8:30 AM – 10:10 AM, Hynes Auditorium

Rationality and Its Roles in Reasoning
Speaker: Jon Doyle, Massachusetts Institute of Technology

The economic theory of rationality promises to equal mathematical logic in its importance for the mechanization of reasoning. We survey the growing literature on how the basic notions of probability, utility, and rational choice, coupled with practical limitations on information and resources, influence the design and analysis of reasoning and representation systems.

■ **Technical Sessions**
8:30 AM – 10:10 AM

Intelligent Multimedia Interfaces
Session Chair: Bob Neches
8:30 AM – 10:10 AM, Ballroom A, Hynes

Understanding Natural Language with Diagrams
Gordon S. Novak Jr., University of Texas at Austin and William C. Bulko, IBM Corporation
8:30 AM – 8:55 AM, Ballroom A, Hynes

Avoiding Unwanted Conversational Implicatures in Text and Graphics
Joseph Marks and Ehud Reiter, Harvard University
8:55 AM – 9:20 AM, Ballroom A, Hynes

Pointing: A Way Toward Explanation Dialogue
Johanna D. Moore, University of Pittsburgh; William R. Swartout, USC–Information Science Institute
9:20 AM – 9:45 AM, Ballroom A, Hynes

Coordinating Text and Graphics in Explanation Generation

Steven K. Feiner and Kathleen R. McKeown, Columbia University
9:45 AM – 10:10 AM, Ballroom A, Hynes

Machine Learning: Learning and Problem Solving

Session Chair: Prasad Tadepalli
8:30 AM – 10:10 AM, Ballroom B, Hynes

Learning Abstraction Hierarchies for Problem Solving

Craig A. Knoblock, Carnegie Mellon University
8:30 AM – 8:55 AM, Ballroom B, Hynes

Learning Search Control for Constraint-Based Scheduling

Megan Eskey and Monte Zweben, NASA Ames Research Center
8:55 AM – 9:20 AM, Ballroom B, Hynes

Adaptive Search by Explanation-Based Learning of Heuristics Censors

Neeraj Bhatnagar, Siemens Corporate Research; Jack Mostow, Rutgers Univ.
9:20 AM – 9:45 AM, Ballroom B, Hynes

Empirical Comparisons of Some Design Replay Algorithms

Brad Blumenthal, University of Texas at Austin
9:45 AM – 10:10 AM, Ballroom B, Hynes

Automated Reasoning: Constraint Satisfaction Problems I

Session Chair: Alan Mackworth
8:30 AM – 10:10 AM, Ballroom C, Hynes

Tree Decomposition with Applications to Constraint Processing

Itay Meiri and Judea Pearl, University of California at Los Angeles; Rina Dechter, Technion-Israel Institute of Technology
8:30 AM – 8:55 AM, Ballroom C, Hynes

Complexity of K-Tree Structured Constraint Satisfaction Problems

Eugene C. Freuder, University of New Hampshire
8:55 AM – 9:20 AM, Ballroom C, Hynes

Some Applications of Graph Bandwidth to Constraint Satisfaction Problems

Ramin Zabih, Stanford University
9:20 AM – 9:45 AM, Ballroom C, Hynes

The Complexity of Constraint Satisfaction in Prolog

Bernard A. Nadel, Wayne State Univ.
9:45 AM – 10:10 AM, Ballroom C, Hynes

Perception and Signal Understanding: Vision

Session Chair: Rod Brooks
8:30 AM – 9:45 AM, Room 304/6, Hynes

Computing Exact Aspect Graphs of Curved Objects: Parametric Surfaces

Jean Ponce, University of Illinois; David J. Kriegman, Yale University
8:30 AM – 8:55 AM, Room 304/6, Hynes

Generalized Shape Autocorrelation

Andrea Califano and Rakesh Mohan, IBM T. J. Watson Research Center
8:55 AM – 9:20 AM, Room 304/6, Hynes

Constraints for the Early Detection of Discontinuity from Motion

Michael J. Black and P. Anandan, Yale University
9:20 AM – 9:45 AM, Room 304/6, Hynes

Automated Reasoning: Theorem Proving and Program Synthesis I

Session Chair: Richard Waters
8:30 AM – 9:45 AM, Room 302, Hynes

Mechanizing Inductive Reasoning

Emmanuel Kounalis and Michaël Rusinowitch, CRIN
8:30 AM – 8:55 AM, Room 302, Hynes

Inductive Synthesis of Equational Programs

Nachum Dershowitz, Univ. of Illinois; Eli Pinchover, Bar-Ilan University
8:55 AM – 9:20 AM, Room 302, Hynes

Automatically Generating Universal Attachments Through Compilation

Karen L. Myers, Stanford University
9:20 AM – 9:45 AM, Room 302, Hynes

■ **AI-On-Line**

9:00 AM – 11:00 AM, Room 210, Hynes

Why and How Corporate America Is Integrating AI into Data Processing

Organized by Jack Rahaim, Digital Equipment Corporation. Moderator: Don Mick, Aetna Life & Causalty. Panelists: Ted Smith, US West; Rosemary Baer, Chemical Bank; Paul Deschamps, Aetna Life and Causalty; Nancy Faucheux, Texaco Inc.

Exhibits

10:00 AM – 6:00 PM, Halls C & D, Hynes

Break

10:10 AM – 11:00 AM

◆ **Invited Panel**

11:00 AM – 12:40 PM, Hynes Auditorium

User Modeling and User Interfaces

Moderator: Kathleen McKeown, Columbia University. Panelists: Susan T. Dumais and James D. Hollan, Bellcore; Karen Sparck Jones, University of Cambridge; Candace Sidner, Digital Equipment Corporation

■ **Technical Sessions**

11:00 AM – 12:40 PM

Automated Reasoning: Evidential Reasoning

Session Chair: Mike Wellman
11:00 AM – 12:40 PM, Ballroom A, Hynes

Two Views of Belief: Belief as Generalized Probability and Belief as Evidence

Joseph Y. Halpern and Ronald Fagin, IBM Almaden Research Center
11:00 AM – 11:25 AM, Ballroom A, Hynes

The Belief Calculus and Uncertain Reasoning

Yen-Teh Hsia, Université Libre de Bruxelles
11:25 AM – 11:50 AM, Ballroom A, Hynes

Symbolic Probabilistic Inference in Belief Networks

Ross D. Shachter and Brendan A. Del Favero, Stanford University; Bruce D'Ambrosio, Oregon State University
11:50 AM – 12:15 PM, Ballroom A, Hynes

Probabilistic Semantics for Cost-Based Abduction

Eugene Charniak and Solomon E. Shimony, Brown University
12:15 PM – 12:40 PM, Ballroom A, Hynes

Machine Learning: Inductive Learning II—Relational and Probabilistic Models

Session Chair: Wray Buntine
11:00 AM – 12:40 PM, Ballroom B, Hynes

Effective Generalization of Relational Descriptions

Larry Watanabe and Larry Rendell, Univ. of Illinois at Urbana-Champaign
11:00 AM – 11:25 AM, Ballroom B, Hynes

Inductive Learning in Probabilistic Domain

Yoichiro Nakakuki, Yoshiyuki Koseki and Midori Tanaka, NEC Corporation
11:25 AM – 11:50 AM, Ballroom B, Hynes

Learning Causal Trees from Dependence Information

Dan Geiger, Northrop Research and Technology Corporation; Azaria Paz, Israel Institute of Technology; Judea Pearl, Univ. of California at Los Angeles
11:50 AM – 12:15 PM, Ballroom B, Hynes

Constructor: A System for the Induction of Probabilistic Models

Robert M. Fung and Stuart L. Crawford, Advanced Decision Systems
12:15 PM – 12:40 PM, Ballroom B, Hynes

Automated Reasoning: Planning I

Session Chair: Mark Drummond
11:00 AM – 12:40 PM, Ballroom C, Hynes

Incremental, Approximate Planning

Charles Elkan, University of Toronto
11:00 AM – 11:25 AM, Ballroom C, Hynes

Synthesis of Reactive Plans for Multi-Path Environments

Froduald Kabanza, Université de Liège
11:25 AM – 11:50 AM, Ballroom C, Hynes

A Theory of Plan Modification

Subbarao Kambhampati, Stanford Univ.
11:50 AM – 12:15 PM, Ballroom C, Hynes

Introducing the Tileworld: Experimentally Evaluating Agent Architectures

Martha E. Pollack, SRI International; Marc Ringuette, Carnegie Mellon Univ.
12:15 PM – 12:40 PM, Ballroom C, Hynes

Knowledge Representation: Inheritance

Session Chair: Phil Klahr
11:00 AM – 12:40 PM, Room 304/6, Hynes

Terminological Cycles in KL-ONE-based Knowledge Representation Languages

Franz Baader, German Research Center for Artificial Intelligence
11:00 AM – 11:25 AM, Room 304/6, Hynes

A Temporal Terminological Logic

Albrecht Schmiedel, Technische Universität Berlin
11:25 AM – 11:50 AM, Room 304/6, Hynes

Boolean Extensions of Inheritance Networks

John F. Horty, University of Maryland; Richmond H. Thomason, University of Pittsburgh
11:50 AM – 12:15 PM, Room 304/6, Hynes

On the Complexity of Monotonic Inheritance with Roles

Ramiro A. de T. Guerreiro and Andrea S. Hemerly, IBM Brazil; Yoav Shoham, Stanford University
12:15 PM – 12:40 PM, Room 304/6, Hynes

Theorem Proving II: Term Rewriting

Session Chair: David Poole
11:00 AM – 11:50 AM, Room 302, Hynes

Skolem Functions and Equality in Automated Deduction

William McCune, Argonne National Laboratory
11:00 AM – 11:25 AM, Room 302, Hynes

Solving Term Inequalities

Gerald E. Peterson, McDonnell Douglas Corporation
11:25 AM – 11:50 AM, Room 302, Hynes

Lunch

12:40 PM – 2:00 PM

AAAI Annual Business Meeting

12:45 PM – 1:15 PM, Hynes Auditorium

AAAI Press Editorial Meeting

1:20 PM, Room 300, Hynes

■ **AI-On-Line**

1:00 PM – 3:00 PM, Room 210, Hynes

What Users are Buying Today in AI and Why: Reports from Management

Organized by Keith Scovell and Tim Holcomb, Andersen Consulting. *Moderator:* Roger Shelm, CIGNA. *Panelists:* Mary Dunn, Mutual of New York; Bill Corbin, Owens Corning; Dave Wise, Frito-Lay; Mike Rogalski, Sears Merchandise Group; Troy A. Heindel, NASA Johnson Space Center; Al Brown, Lockheed Missiles & Space Co.

◆ **Tutorial Program**

2:00 PM – 6:00 PM

Tutorial WP1: Explanation-Based Learning: Problems and Methods

Smadar Kedar and Steven Minton
2:00 PM – 6:00 PM, Salon G, Marriott Copley Place

Tutorial WP2: AI and Engineering Design

Duvvuru Sriram and Chris Tong
2:00 PM – 6:00 PM, Salon A, Marriott Copley Place

Tutorial WP3: Designing Complex Systems Using CLOS

Richard Gabriel and John L. White
2:00 PM – 6:00 PM, Salon F, Marriott Copley Place

Tutorial WP4: Qualitative Reasoning About Physical Systems

Benjamin Kuipers and Elisha Sacks
2:00 PM – 6:00 PM, Salon K, Marriott Copley Place

Tutorial WP5: Genetic Algorithms and Classifier Systems

David E. Goldberg and John R. Koza
2:00 PM – 6:00 PM, Salon E, Marriott Copley Place

■ AI-On-Line

3:15 PM – 5:15 PM, Room 210, Hynes

Developing Real-Time On-Line Applications

Organized by Didi Murnane, Gensym Corporation. *Moderator:* Karlene A. Kosanovich, E. I. DuPont de Nemours and Company. *Panelists:* Dorothy Yu, Coopers & Lybrand; Karl-Erik Arzen, Lund Institute of Technology, Sweden; Gregory M. O'Connor, Massachusetts Institute of Technology; Paul D. Schoen, Rockwell International; Jean-Pierre Aubert, Alcatel ISR France.

Thursday, August 2

Conference Registration

7:30 AM – 6:00 PM, Hall B, Hynes

AAAI Publication Committee Meeting

7:30 AM, Room 300, Hynes

◆ Invited Talk

8:30 AM – 10:10 AM, Hynes Auditorium

Truth Maintenance

Speaker: David A. McAllester, Massachusetts Institute of Technology

A survey of the state of the art in truth maintenance with an emphasis on current theoretical research issues.

■ Technical Sessions

8:30 AM – 10:10 AM

Natural Language: Interpretation

Session Chair: Julia Hirschberg
8:30 AM – 10:10 AM, Ballroom A, Hynes

Towards Incremental Disambiguation with a Generalized Discrimination Network

Manabu Okumura and Hozumi Tanaka, Tokyo Institute of Technology
8:30 AM – 8:55 AM, Ballroom A, Hynes

Parsing a Natural Language Using Mutual Information Statistics

David M. Magerman and Mitchell P. Marcus, University of Pennsylvania
8:55 AM – 9:20 AM, Ballroom A, Hynes

Integrating Natural Language Processing and Knowledge Based Processing

Rebecca Passonneau, Carl Weir, and Tim Finin, Unisys Corporation; Martha Palmer, Center for Advanced Information Technology
9:20 AM – 9:45 AM, Ballroom A, Hynes

Truly Parallel Understanding of Text

Yeong-Ho Yu and Robert F. Simmons, University of Texas at Austin
9:45 AM – 10:10 AM, Ballroom A, Hynes

Machine Learning: Inductive Learning III

Session Chair: Philip Laird
8:30 AM – 10:10 AM, Ballroom B, Hynes

Adding Domain Knowledge to SBL through Feature Construction

Christopher John Matheus, GTE Laboratories Incorporated
8:30 AM – 8:55 AM, Ballroom B, Hynes

What Should Be Minimized in a Decision Tree?

Usama M. Fayyad and Keki B. Irani, University of Michigan
8:55 AM – 9:20 AM, Ballroom B, Hynes

Myths and Legends in Learning Classification Rules

Wray Buntine, Turing Institute
9:20 AM – 9:45 AM, Ballroom B, Hynes

Inductive Learning in a Mixed Paradigm Setting

David B. Skalak and Edwina L. Rissland, University of Massachusetts
9:45 AM – 10:10 AM, Ballroom B, Hynes

Robotics: Robot Planning

Session Chair: Pattie Maes
8:30 AM – 10:10 AM, Ballroom C, Hynes

Symmetry Constraint Inference in Assembly Planning: Automatic Assembly Configuration Specification

Yanxi Liu and Robin J. Popplestone, University of Massachusetts at Amherst
8:30 AM – 8:55 AM, Ballroom C, Hynes

Indexical Knowledge in Robot Plans

Yves Lespérance and Hector J. Levesque, University of Toronto
8:55 AM – 9:20 AM, Ballroom C, Hynes

A Hierarchical Planner that Generates its Own Hierarchies

Jens Christensen, Stanford University
9:20 AM – 9:45 AM, Ballroom C, Hynes

Learning General Completable Reactive Plans

Melinda T. Gervasio, University of Illinois at Urbana-Champaign
9:45 AM – 10:10 AM, Ballroom C, Hynes

Knowledge Representation: Representation and Uncertainty

Session Chair: Kurt Konolige
8:30 AM – 10:10 AM, Room 304/6, Hynes

A Maximum Entropy Approach to Nonmonotonic Reasoning

Moisés Goldszmidt and Judea Pearl, University of California at Los Angeles; Paul Morris, IntelliCorp
8:30 AM – 8:55 AM, Room 304/6, Hynes

A Probabilistic Interpretation for Lazy Nonmonotonic Reasoning

Ken Satoh, Institute for New Generation Computer Technology
8:55 AM – 9:20 AM, Room 304/6, Hynes

A Hybrid Framework for Representing Uncertain Knowledge

Alessandro Saffiotti, Université Libre de Bruxelles
9:20 AM – 9:45 AM, Room 304/6, Hynes

Probabilities that Imply Certainties

Haim Shvaytser, David Sarnoff Research Center
9:45 AM – 10:10 AM, Room 304/6, Hynes

■ AI-On-Line

9:00 AM – 11:00 AM, Room 210, Hynes

Differentiating Expert Systems Products

Organized by Larry Harris, AICorp and Robert Keller, Renaissance International. *Moderator:* E. Robert Keller, President, Renaissance International. *Panelists:* Larry Harris, AICorp; Harry C. Reinstein, Aion Corp.; Alain Rappaport, Neuron Data; Robert Moore, Gensym.

■ Exhibits

10:00 AM – 5:00 PM, Hall C & D, Hynes

Break

10:10 AM – 11:00 AM

▼ Highlights from the Innovative Applications of Artificial Intelligence Conference, May 1990—Part I

Moderator: Howard Shrobe, Standing Conference Committee Chair
11:00 AM – 12:15 PM, Hynes Auditorium

Inspector: An Expert System For Monitoring Worldwide Trading Activities in Foreign Exchange

Elizabeth Byrnes, Thomas Campfield, Neil Henry, and Steven Waldman, Manufacturers Hanover Trust
11:00 AM – 11:25 AM, Hynes Auditorium

CONSTRUE/TIS: A System for Content-Based Indexing of a Database of News Stories

Philip J. Hayes, Carnegie Group Incorporated; Steven P. Weinstein, Reuters Ltd
11:25 AM – 11:50 AM, Hynes Auditorium

A Real-Time Alarm Analysis Advisor

Steven Silverman, James Dixon, Tim Fink, and Paul Kotas, Consolidated Edison Company of New York, Incorporated; Alvin Shoop, Bhashyam Ramesh, and Philip Klahr, Inference Corporation
11:50 AM – 12:15 PM, Hynes Auditorium

■ Technical Sessions

11:00 AM – 12:40 PM

Intelligent Interfaces and Plan Recognition

Session Chair: Tom Malone
11:00 AM – 12:40 PM, Ballroom A, Hynes

Models of Plans to Support Communication: An Initial Report

Karen E. Lochbaum and Barbara J. Grosz, Harvard University; Candace L. Sidner, Digital Equipment Corporation
11:00 AM – 11:25 AM, Ballroom A, Hynes

Incorporating Default Inferences Into Plan Recognition

Sandra Carberry, University of Delaware
11:25 AM – 11:50 AM, Ballroom A, Hynes

A Cooperative Problem Solving System for User Interface Design

Andreas C. Lemke and Gerhard Fischer, University of Colorado
11:50 AM – 12:15 PM, Ballroom A, Hynes

A Collaborative Interface for Editing Large Knowledge Bases

Loren G. Terveen and David A. Wroblewski, MCC Human Interface Laboratory
12:15 PM – 12:40 PM, Ballroom A, Hynes

Commonsense Reasoning: Model-Based Diagnosis and Design I

Session Chair: Benjamin Kuipers
11:00 AM – 12:15 PM, Ballroom B, Hynes

Interaction-Based Invention: Designing Novel Devices from First Principles

Brian Williams, Xerox Palo Alto Research Center
11:00 AM – 11:25 AM, Ballroom B, Hynes

Characterizing Diagnoses

Johan de Kleer, Xerox Palo Alto Research Center; Alan K. Mackworth, University of British Columbia; Raymond Reiter, University of Toronto
11:25 AM – 11:50 AM, Ballroom B, Hynes

Abductive and Default Reasoning: A Computational Core

Bart Selman and Hector J. Levesque, University of Toronto
11:50 AM – 12:15 PM, Ballroom B, Hynes

Automated Reasoning: Planning II

Session Chair: Daniel Corkill
11:00 AM – 12:40 PM, Ballroom C, Hynes

ABTWEAK: Abstracting a Nonlinear, Least Commitment Planner

Qiang Yang, University of Waterloo; Josh D. Tenenbergs, Univ. of Rochester
11:00 AM – 11:25 AM, Ballroom C, Hynes

The STRIPS Assumption for Planning Under Uncertainty

Michael P. Wellman, Wright-Patterson AFB
11:25 AM – 11:50 AM, Ballroom C, Hynes

Getting Serious About Parsing Plans: A Grammatical Analysis of Plan Recognition

Marc Vilain, The MITRE Corporation
11:50 AM – 12:15 PM, Ballroom C, Hynes

Mapping and Retrieval During Plan Reuse: A Validation Structure Based Approach

Subbarao Kambhampati, Stanford Univ.
12:15 PM – 12:40 PM, Ballroom C, Hynes

Knowledge Representation: Complexity and Expressiveness

Session Chair: Henry Kautz
11:00 AM – 12:40 PM, Room 304/6, Hynes

An Optimally Efficient Limited Inference System

Lokendra Shastri and Venkat Ajjanagadde, University of Pennsylvania
11:00 AM – 11:25 AM, Room 304/6, Hynes

On the Expressiveness of Networks with Hidden Variables

Rina Dechter, Technion-Israel Institute of Technology
11:25 AM – 11:50 AM, Room 304/6, Hynes

The Complexity of Closed World Reasoning and Circumscription

Marco Cadoli and Maurizio Lenzerini, Università di Roma "La Sapienza"
11:50 AM – 12:15 PM, Room 304/6, Hynes

It's Not My Default: The Complexity of Membership Problems in Restricted Propositional Default Logics

Jonathan Stillman, General Electric Research and Development Center
12:15 PM – 12:40 PM, Room 304/6, Hynes

Lunch

12:40 PM – 2:00 PM

Subgroup Meetings

12:45 PM – 1:30 PM

AI and the Law Subgroup Meeting

12:45 PM – 1:30 PM, Room 302, Hynes

AI in Manufacturing Subgroup Meeting

12:45 PM – 1:30 PM, Room 304/6, Hynes

■ AI-on-Line

2:00 PM – 4:00 PM, Room 210, Hynes

AI Versus Conventional Data Processing

Organized by Keith Scovell and Tim Holcomb, Andersen Consulting. *Moderator:* Bruce B. Johnson, Anderson Consulting. *Panelists:* Bradley Billetdeaux, Exxon Company USA; Stanley Wozniak, MCI; Dave Dean, Eastman Kodak; Glen Galen, Burlington Northern Railroad Information Systems, Ed Mahler, E. I. DuPont de Nemours and Company

▼ Highlights from the Innovative Applications of Artificial Intelligence Conference, May 1990—Part II

Moderator: Howard Shrobe, Standing Conference Committee Chair
2:10 AM – 3:25 PM, Hynes Auditorium

Prism: A Case-Based Telex Classifier

Marc Goodman,
Cognitive Systems Incorporated
2:10 PM – 2:35 PM, Hynes Auditorium

National Dispatcher Router: A Multi-Paradigm Based Scheduling Advisor or From Prototype to Production System

Janet Rothstein,
Digital Equipment Corporation
2:35 PM – 3:00 PM, Hynes Auditorium

Development of Expert Systems Supported Construction Planning for Shield Tunneling Method

Minoru Harada and Zenichi Igarashi, Okumura Corporation; Satoshi Okuide, Hitachi Ltd; Yasuhiro Kitagawa, Hitachi Seibu Software Company Ltd
3:00 PM – 3:25 PM, Hynes Auditorium

■ Technical Sessions

2:10 PM – 3:50 PM

Commonsense Reasoning: Qualitative Modeling of Physical Systems

Session Chair: Leo Joskowicz
2:10 PM – 3:50 PM, Ballroom A, Hynes

QPC: A Compiler from Physical Models into Qualitative Differential Equations

J. Crawford, A. Farquhar and B. Kuipers, University of Texas at Austin
2:10 PM – 2:35 PM, Ballroom A, Hynes

Self-Explanatory Simulations: An Integration of Qualitative and Quantitative Knowledge

Kenneth D. Forbus, University of Illinois; Brian Falkenhainer, Xerox Palo Alto Research Center
2:35 PM – 3:00 PM, Ballroom A, Hynes

Dynamic Across-Time Measurement Interpretation

Dennis DeCoste, University of Illinois
3:00 PM – 3:25 PM, Ballroom A, Hynes

Obtaining Quantitative Predictions from Monotone Relationships

Joseph Hellerstein, IBM T. J. Watson Research Center
3:25 PM – 3:50 PM, Ballroom A, Hynes

Machine Learning: Discovery and Learning Robots

Session Chair: Tom Mitchell
2:10 PM – 3:50 PM, Ballroom C, Hynes

Learning to Coordinate Behaviors

Pattie Maes and Rodney A. Brooks, Massachusetts Institute of Technology
2:10 PM – 2:35 PM, Ballroom C, Hynes

Two Case Studies in Cost-Sensitive Concept Acquisition

Ming Tan and Jeffrey C. Schlimmer, Carnegie Mellon University
2:35 PM – 3:00 PM, Ballroom C, Hynes

A Proven Domain-Independent Scientific Function-Finding Algorithm

Cullen Schaffer, Rutgers University
3:00 PM – 3:25 PM, Ballroom C, Hynes

Automated Discovery in a Chemistry Laboratory

Jan M. Zytkow, Jieming Zhu and Abul Hussam, George Mason University
3:25 PM – 3:50 PM, Ballroom C, Hynes

Automated Reasoning: Constraint Satisfaction Problems II

Session Chair: David McAllester
2:10 PM – 3:25 PM, Room 302, Hynes

Dynamic Constraint Satisfaction Problems

Sanjay Mittal and Brian Falkenhainer, Xerox Palo Alto Research Center
2:10 PM – 2:35 PM, Room 302, Hynes

An Algebraic Approach to Conflict Resolution in Planning

Qiang Yang, University of Waterloo
2:35 PM – 3:00 PM, Room 302, Hynes

Solving Large-Scale Constraint-Satisfaction and Scheduling Problems Using a Heuristic Repair Method

Steven Minton, Andrew B. Philips and Philip Laird, NASA Ames Research Center; Mark D. Johnston, Space Telescope Science Institute
3:00 PM – 3:25 PM, Room 302, Hynes

Knowledge Representation: Default Representations

Session Chair: Bill Mark
2:10 PM – 3:50 PM, Room 304/6, Hynes

The Representation of Defaults in Cyc

Ramanathan V. Guha, MCC
2:10 PM – 2:35 PM, Room 304/6, Hynes

Conditional Logics of Normality as Modal Systems

Craig Boutilier, University of Toronto
2:35 PM – 3:00 PM, Room 304/6, Hynes

The Generalized Theory of Model Preference

Piotr Rychlik, Polish Acad. of Sciences
3:00 PM – 3:25 PM, Room 304/6, Hynes

Nonmonotonicity and the Scope of Reasoning: Preliminary Report

David W. Etherington, AT&T Bell Laboratories; Sarit Kraus and Donald Perlis, University of Maryland
3:25 PM – 3:50 PM, Room 304/6, Hynes

Break

3:50 PM – 4:40 PM

◆ Invited Talk

4:40 PM – 6:20 PM, Hynes Auditorium

Reasoning and Acting in Real Time

Speaker: Stanley J. Rosenschein, Teleos Research

Some reasoning problems can be approached as if time didn't matter: facts are presented to the system, conclusions are derived, and the usefulness of the conclusions is relatively independent of the time it takes to derive them. In many real-world reasoning problems, however, time is an essential consideration: the world is changing, new information is being acquired, and reasoning processes must produce actions that can be performed while they are still timely. Unfortunately, many of the symbolic reasoning techniques developed by the artificial intelligence research community over the years are more appropriate to "timeless" reasoning than to "timely" reasoning. Recently, however, a new body of AI research has sprung up that directly addresses the issue of reasoning and acting under time pressure. This talk will survey this new research area and suggest directions for future work.

■ Technical Sessions

4:40 PM – 5:55 PM

AI and Education

Session Chair: Beverly Woolf

4:40 PM – 5:55 PM, Ballroom A, Hynes

Backward Model Tracing: An Explanation-Based Approach for Reconstructing Student Reasoning

Danilo Fum, Università di Trieste; Paolo Giangrandi, and Carlo Tasso, Università di Udine

4:40 PM – 5:05 PM, Ballroom A, Hynes

A Blackboard-Based Dynamic Instructional Planner

William R. Murray, FMC Corporate Technology Center

5:05 PM – 5:30 PM, Ballroom A, Hynes

Towards a System Architecture Supporting Contextualized Learning

Gerhard Fischer, Andreas C. Lemke, and Raymond McCall, Univ. of Colorado

5:30 PM – 5:55 PM, Ballroom A, Hynes

Machine Learning: Speed Up Learning

Session Chair: Tom Ellman

4:40 PM – 6:20 PM, Ballroom B, Hynes

Extending EBG to Term-Rewriting Systems

Philip Laird and Evan Gamble, NASA Ames Research Center

4:40 PM – 5:05 PM, Ballroom B, Hynes

Why Prodigy/EBL Works

Oren Etzioni, Carnegie Mellon Univ.

5:05 PM – 5:30 PM, Ballroom B, Hynes

Operationality Criteria for Recursive Predicates

Stanley Letovsky, Carnegie Mellon Univ.

5:30 PM – 5:55 PM, Ballroom B, Hynes

The Utility of EBL in Recursive Domain Theories

Devika Subramanian and Ronen Feldman, Cornell University

5:55 PM – 6:20 PM, Ballroom B, Hynes

Automated Reasoning: Planning III

Session Chair: David Wilkins

4:40 PM – 6:20 PM, Ballroom C, Hynes

An Approach to Reasoning About Continuous Change for Applications in Planning

Thomas Dean and Greg Siegle, Brown University

4:40 PM – 5:05 PM, Ballroom C, Hynes

Anytime Synthetic Projection: Maximizing the Probability of Goal Satisfaction

Mark Drummond and John Bresina, NASA Ames Research Center

5:05 PM – 5:30 PM, Ballroom C, Hynes

Admissible Criteria for Loop Control in Planning

Roy Feldman and Paul Morris, IntelliCorp

5:30 PM – 5:55 PM, Ballroom C, Hynes

Practical Temporal Projection

Steven Hanks, Univ. of Washington

5:55 PM – 6:20 PM, Ballroom C, Hynes

Knowledge Representation: Databases and Connectionism

Session Chair: James Schmolze

4:40 PM – 5:55 PM, Room 304/6, Hynes

The Intelligent Database Interface: Integrating AI and Database Systems

Don McKay, Tim Finin, and Anthony O'Hare, Unisys Center for Advanced Information Technology

4:40 PM – 5:05 PM, Room 304/6, Hynes

A Structured Connectionist Unification Algorithm

Steffen Hölldobler, International Computer Science Institute

5:05 PM – 5:30 PM, Room 304/6, Hynes

Connectionism, Rule Following, and Symbolic Manipulation

Robert F. Hadley, Simon Fraser Univ.

5:30 PM – 5:55 PM, Room 304/6, Hynes

Tour of MIT AI Lab

5:00 PM – 7:30 PM

Friday, August 3

Conference Registration

7:30 AM – 11:30 AM, Hall B, Hynes

IJCAI Trustee's Meeting

8:00 AM – 6:00 PM, Vineyard Room, Marriott Copley Place

◆ Invited Talk

8:30 AM – 10:10 AM, Hynes Auditorium

Massively Parallel AI

Speaker: David L. Waltz, Thinking Machines Corporation and Brandeis University

It is argued that massively parallel machines (e. g. the Connection Machine) offer a better match for cognitive as well as for applied AI than serial computers. However, existing AI paradigms need to be modified or replaced to realize the benefits, and

some traditional AI problems (e. g. expert systems with small numbers of rules) may not be large enough to justify a massively parallel solution. A brief history, a description of some new paradigms and practical examples, and a discussion of future prospects for massively parallel AI will be included.

■ Technical Sessions

8:30 AM – 10:10 AM

Commonsense Reasoning: Model-Based Diagnosis II

Session Chair: Walter Hamscher
8:30 AM – 10:10 AM, Ballroom A, Hynes

On the Role of Coherence in Abductive Explanation

Hwee Tou Ng and Raymond J. Mooney,
University of Texas at Austin
8:30 AM – 8:55 AM, Ballroom A, Hynes

Model-Based Diagnosis of Planning Failures

Lawrence Birnbaum, Gregg Collins,
Michael Freed, and Bruce Krulwich,
Northwestern University
8:55 AM – 9:20 AM, Ballroom A, Hynes

Efficient Diagnosis of Multiple Disorders Based on a Symptom Clustering Approach

Thomas D. Wu,
Massachusetts Institute of Technology
9:20 AM – 9:45 AM, Ballroom A, Hynes

Physical Impossibility Instead of Fault Models

Gerhard Friedrich, Georg Gottlob,
Wolfgang Nejdl, Technical
University of Vienna
9:45 AM – 10:10 AM, Ballroom A, Hynes

Machine Learning: Generalization and Specialization

Session Chair: Paul Utgoff
8:30 AM – 10:10 AM, Ballroom B, Hynes

Generalization with Taxonomic Information

Alan M. Frisch and C. David Page,
University of Illinois
8:30 AM – 8:55 AM, Ballroom B, Hynes

Complementary Discrimination Learning: A Duality Between Generalization and Discrimination

Wei-Min Shen, MCC
8:55 AM – 9:20 AM, Ballroom B, Hynes

Incremental Non-Backtracking Focusing: A Polynomially Bounded Generalization

Algorithm for Version Spaces
Benjamin D. Smith and Paul S. Rosenbloom,
Univ. of Southern California
9:20 AM – 9:45 AM, Ballroom B, Hynes

Knowledge Level and Inductive Uses of Chunking (EBL)

Paul S. Rosenbloom, University of
Southern California - ISI; Jans Aasman,
Rijksuniversiteit Groningen
9:45 AM – 10:10 AM, Ballroom B, Hynes

Robotics:

Intelligent Mobile Robots

Session Chair: Stan Rosenschein
8:30 AM – 10:10 AM, Ballroom C, Hynes

Integrating Execution, Planning, and Learning in Soar for External Environments

John E. Laird, University of Michigan;
Paul S. Rosenbloom, University of
Southern California-ISI
8:30 AM – 8:55 AM, Ballroom C, Hynes

Becoming Increasingly Reactive

Tom M. Mitchell, Carnegie Mellon Univ.
8:55 AM – 9:20 AM, Ballroom C, Hynes

Coping with Uncertainty in a Control System for Navigation and Exploration

Thomas Dean, Kenneth Basye, Robert
Chekaluk, Seungseok Hyun, Moises
Lejter and Margaret Randazza, Brown
University
9:20 AM – 9:45 AM, Ballroom C, Hynes

LOGnets: A Hybrid Graph Spatial Representation for Robot Navigation

Peter K. Malkin and Sanjaya Addanki,
IBM T. J. Watson Research Center
9:45 AM – 10:10 AM, Ballroom C, Hynes

Knowledge Representation: Architectures

Session Chair: Bob MacGregor
8:30 AM – 10:10 AM, Room 304/6, Hynes

On the Performance of Lazy Matching in Production Systems

Daniel P. Miranker, David Brant, Bernie
Lofaso and David Gadbois,
University of Texas at Austin
8:30 AM – 8:55 AM, Room 304/6, Hynes

A Framework for Investigating Production System Formulations with Polynomially Bounded Match

Milind Tambe, Carnegie Mellon Uni-
versity; Paul S. Rosenbloom, University
of Southern California - ISI
8:55 AM – 9:20 AM, Room 304/6, Hynes

Very Fast Decision Table Execution of

Propositional Expert Systems

Robert M. Colomb and Charles Y. C.
Chung, CSIRO Division of Information
Technology
9:20 AM – 9:45 AM, Room 304/6, Hynes

A Principled Approach to Reasoning About the Specificity of Rules

John Yen, Texas A&M University
9:45 AM – 10:10 AM, Room 304/6, Hynes

Break

10:10 AM – 11:00 AM

▲ Plenary Addresses

11:00 AM – 12:40 PM, Hynes Auditorium

Introduction

Daniel G. Bobrow, President AAAI

AI and the National Technological Infrastructure

Craig Fields, Department of Defense

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