Seventeenth International Joint Conference on Artificial Intelligence

Washington State Convention & Trade Center
Seattle, Washington • USA
August 4 - 10, 2001

I J C A I ✦ 0 1

Sponsored by

The International Joint Conferences
on Artificial Intelligence, Inc. (IJCAII)
and American Association for
Artificial Intelligence (AAAI)

Registration Brochure

W W W . I J C A I . O R G

Introduction

IJCAI-01, the Seventeenth International Joint Conference on Artificial Intelligence, is sponsored by the International Joint Conferences on Artificial Intelligence, Inc. (IJCAII) and the American Association for Artificial Intelligence (AAAI).

IJCAII sponsors biennial conferences on artificial intelligence, which are the main forums for presenting AI research results to the international AI community. Previous conference sites were Washington D.C., USA (1969), London, England (1971), Stanford, California, USA (1973), Tbilisi, Georgia, USSR (1975), Cambridge, Massachusetts, USA (1977), Tokyo, Japan (1979), Vancouver, British Columbia, Canada (1981), Karlsruhe, Germany (1983), Los Angeles, California, USA (1985), Milan, Italy (1987), Detroit, Michigan, USA (1989), Sydney, Australia (1991), Chambery, Savoie, France (1993), Montreal, Canada (1995), Nagoya, Japan (1997), and Stockholm, Sweden (1999). IJCAI will be held in Acapulco, Mexico in 2003.

Corporate Sponsorship

IJCAI-01 gratefully acknowledges the generous contributions of the following corporations and organizations:

AT&T Labs – Research • The Boeing Company Interprice Technologies • Microsoft Corporation • NEC Research

IJCAI-01 Conference Committee

CONFERENCE CHAIR:

Hector J. Levesque, University of Toronto (Canada)

PROGRAM CHAIR:

Bernhard Nebel, Albert-Ludwigs-Universität, Freiburg (Germany)

LOCAL ARRANGEMENTS CHAIR:

James Hoard, Boeing, Seattle (USA)

SECRETARY-TREASURER:

Ronald J. Brachman, AT&T Labs – Research (USA)

Advisory Committee:

Bruce Buchanan, University of Pittsburgh (USA)
Silvia Coradeschi, Örebro University (Sweden)
Olivier Faugeras, INRIA (France)
Cheng Hu, Chinese Academy of Sciences (China)
Nicholas Jennings, University of London (England)

Henry Kautz, University of Washington (USA)
Robert Mercer, University of Western Ontario (Canada)
Silvia Miksch, Vienna University of Technology (Austria)
Devika Subramanian, Rice University (USA)
L. Enrique Sucar, Monterrey Institute of Technology (Mexico)
Ramasamy Uthurusamy, General Motors Research (USA)
Mary-Anne Williams, University of Newcastle (Australia)

Program Committee:

Elisabeth André, DFKI GmbH (Germany)
Minoru Asada, Osaka University (Japan)
Franz Baader, RWTH Aachen (Germany)
Craig Boutilier, University of Toronto (Canada)
Didier Dubois, IRIT-CNRS (France)
Maria Fox, University of Durham (United Kingdom)
Hector Geffner, Universidad Simón Bolívar (Venezuela)
Georg Gottlob, Vienna University of Technology (Austria)
Haym Hirsh, Rutgers University (USA)
Eduard Hovy, Information Sciences Institute (USA)
Joxan Jaffar, National University of Singapore (Singapore)
Daphne Koller, Stanford University (USA)

Fangzhen Lin, Hong Kong University of Science and Technology (Hong Kong)

Heikki Mannila, Nokia Research Center (Finland)

Robert Milne, Intelligent Applications (United Kingdom)

Daniele Nardi, Università di Roma "La Sapienza" (Italy)

Dana Nau, University of Maryland (USA)

Patrick Prosser, University of Glasgow (UK)

Francesca Rossi, Università di Padova (Italy)

Christoph Schlieder, Universität Bremen (Germany)

Yoav Shoham, Stanford University (USA)

Piero Torasso, Università di Torino (Italy)

Carme Torras, Institut de Robotica i Informatica Industrial (Spain)

Jan Treur, Vrije Universiteit Amsterdam (The Netherlands)

John Tsotsos, York University (Canada)

Manuela Veloso, Carnegie Mellon University (USA)

Ian Watson, University of Auckland (New Zealand)

Brian Williams, Massachusetts Institute of Technology (USA)

Mary-Anne Williams, The University of Newcastle (Australia)

Makoto Yokoo, NTT Communication Science Lab (Japan)

TUTORIAL CHAIR:

Michael Wellman, University of Michigan (USA)

WORKSHOP CHAIR:

Peter van Beek, University of Waterloo (Canada)

LOCAL ARRANGEMENTS COMMITTEE:

James Hoard (Chair), Boeing (USA)

Gary Coen, Boeing (USA)

Rob Jasper, Fizzy Lab (USA)

Oscar Kipersztok, Boeing (USA)

Chris McConnell, Microsoft (USA)

Rick Wojcik, Boeing (USA)

IJCAII Organization

TRUSTEES:

Luigia Carlucci Aiello (President), Università di Roma "La Sapienza" (Italy)

Anthony G. Cohn, University of Leeds (England)

Thomas L. Dean, Brown University (USA)

Michael P. Georgeff, Australian AI Institute (Australia)

Georg Gottlob, Vienna University of Technology (Austria)

Hector Levesque, University of Toronto (Canada)

Bernhard Nebel, Albert-Ludwigs-Universität, Freiburg (Germany)

C. Raymond Perrault, SRI International (USA)

SECRETARIAT:

Ronald J. Brachman, Secretary-Treasurer, AT&T Labs – Research (USA)

Priscilla Rasmussen, Academic & Research Conference Services (USA)

FORMER CONFERENCE CHAIR TRUSTEES:

Wolfgang Wahlster, DFKI GmbH (Germany)

Barbara J. Grosz, Harvard University (USA)

Wolfgang Bibel, Technische Universität Darmstadt (Germany)

Alan Bundy, University of Edinburgh (Scotland)

Alan Mackworth, University of British Columbia (Canada)

Saul Amarel, Rutgers University (USA)

Patrick J. Hayes, University of West Florida (USA)

Raj Reddy, Carnegie Mellon University (USA)

Erik Sandewall, Linköping University (Sweden)

Alistair D.C. Holden (deceased), formerly University of Washington (USA)

Max B. Clowes (deceased), formerly University of Sussex (England)

Donald E. Walker (deceased), formerly Bellcore (USA)

Woodrow W. Bledsoe (deceased), formerly University of Texas at Austin (USA)

FORMER PROGRAM CHAIR TRUSTEES:

Martha Pollack, University of Michigan (USA)

Chris Mellish, University of Edinburgh (UK)

Ruzena Bajcsy, National Science Foundation/University of Pennsylvania (USA)

Ray Reiter, University of Toronto (Canada)

John Mylopoulos, University of Toronto (Canada)

N. S. Sridharan, FMC Corporation (USA)

John McDermott, ellora.com (USA)

Aravind K. Joshi, University of Pennsylvania (USA)

Alan Bundy, University of Edinburgh (UK)

Roger Schank, Northwestern University (USA)

Bruce Buchanan, University of Pittsburgh (USA)

Saburo Tsuji, Osaka University (Japan)

Raj Reddy, Carnegie Mellon University (USA)

Patrick Winston, Massachusetts Institute of Technology (USA)

Carl Hewitt, Massachusetts Institute of Technology (USA)

Nils Nilsson, Stanford University (USA)

David C. Cooper, University College of Swansea (UK)

Donald E. Walker (deceased), formerly Bellcore (USA)

AAAI Organization

OFFICERS

Bruce G. Buchanan, President, University of Pittsburgh

Tom M. Mitchell, President-Elect, Carnegie Mellon University

David L. Waltz, Past President, NEC Research Institute, Inc.

Norman R. Nielsen, Secretary-Treasurer, SRI International

COUNCILORS (THROUGH 2001)

Henry Kautz, University of Washington

David McAllester, AT&T Labs – Research

Johanna Moore, University of Pittsburgh

Michael P. Wellman, University of Michigan

COUNCILORS (THROUGH 2002)

Deborah McGuinness, Stanford University

Bart Selman, Cornell University

Reid Simmons, Carnegie Mellon University

Manuela Veloso, Carnegie Mellon University

COUNCILORS (THROUGH 2003)

Craig Boutilier, University of Toronto

Rina Dechter, University of California, Irvine

Richard Doyle, Jet Propulsion Laboratory, California Institute of Technology

David Poole, University of British Columbia

STANDING COMMITTEES

Conference: Paul Rosenbloom, Chair, USC/Information Sciences Institute

Fellows and Nominating: David L. Waltz, Chair, NEC Research

Finance: Norman R. Nielsen, Chair, SRI International

Grants: Manuela Veloso, Chair, Carnegie Mellon University

Membership: Reid Simmons, Chair, Carnegie Mellon University

Publications: Kenneth Ford, Chair, UWF/Institute for Human and Machine Cognition

Symposium: Ian Horswill, Chair, Northwestern University

AAAI STAFF

Carol McKenna Hamilton, Executive Director

Colleen Boyce, Accountant and Office Manager

Keri Vasser Harvey, Senior Conference Coordinator

Mary Christine Armstrong, Conference Coordinator

Joanne Langeraar, Conference Assistant

Richard A. Skalsky, Information Technology Manager

Jhossy Quezada, Membership Coordinator

Eva Coronel, Administrative Assistant

AAAI PUBLICATIONS

Kenneth Ford, Editor-in-Chief, AAAI Press, UWF/Institute for Human and Machine Cognition

David Leake, Editor-in-Chief, AI Magazine, University of Indiana

David Mike Hamilton, Director, Live Oak Press

IJCAI-01 Award for Research Excellence

The IJCAI Award for Research Excellence is given at the IJCAI conference to a scientist who has carried out a program of research of consistently high quality, yielding several substantial results. Past recipients of this award are John McCarthy (1985), Allen Newell (1989), Marvin Minsky (1991), Raymond Reiter (1993), Herbert Simon (1995), Aravind Joshi (1997), and Judea Pearl (1999).

The winner of the 2001 IJCAI Award for Research Excellence is Donald Michie, Professor Emeritus of Machine Intelligence at the University of Edinburgh, Edinburgh, Scotland. Professor Michie is recognized for his contributions to Machine Learning, Robotics, and Knowledge-Based Systems. The Research Excellence Lecture will be held Thursday, August 9.

IJCAI Computers and Thought Award

The Computers and Thought Award is presented at IJCAI conferences to outstanding young scientists in artificial intelligence. The award was established with royalties received from the book *Computers and Thought*, edited by Edward Feigenbaum and Julian Feldman; it is currently supported by income from IJCAII funds.

Past recipients of this honor have been Terry Winograd (1971), Patrick Winston (1973), Chuck Rieger (1975), Douglas Lenat (1977), David Marr (1979), Gerald Sussman (1981), Tom Mitchell (1983), Hector Levesque (1985), Johan de Kleer (1987), Henry Kautz (1989), Rodney Brooks (1991), Martha Pollack (1991), Hiroaki Kitano (1993), Sarit Kraus (1995), Stuart Russell (1995), Leslie Kaelbling (1997), and Nicholas Jennings (1999).

The winner of the 2001 IJCAI Computers and Thought Award is Daphne Koller, Assistant Professor at the Department of Computer Science of Stanford University, Stanford, USA. Professor Koller is recognized for her contributions to the theory and practice of probabilistic reasoning, machine learning, and computational game theory. The Computers and Thought Lecture, to be held Tuesday, August 7, is open to the public.

The Donald E. Walker Distinguished Service Award

The IJCAI Distinguished Service Award was established in 1979 by the IJCAII Trustees to honor senior scientists in AI for contributions and service to the field during their careers. Previous recipients have been Bernard Meltzer (1979), Arthur Samuel (1983), Donald Walker (1989), Woodrow Bledsoe (1991), Daniel G. Bobrow (1993) and Wolfgang Bibel (1999).

In 1993, the IJCAI Distinguished Service Award was renamed the Donald E. Walker Distinguished Service Award in memory of the late Donald E. Walker, who shaped the IJCAII organization as its Secretary-Treasurer.

At IJCAI-01, the Donald E. Walker Distinguished Service Award will be given to Barbara Grosz, Gordon McKay Professor for Computer Science at Harvard University, Cambridge, USA. As a pioneering researcher in discourse and collaboration in natural language, Professor Grosz is recognized for her outstanding service to the international AI community as President of AAAI (1993-95) and Chair of IJCAI (1989-1991), and for her contribution to enhancing the role of women in science.

For more information about the winners please refer to the following web pages:

Professor Barbara Grosz
http://www.eecs.harvard.edu/grosz/

Professor Daphne Koller
http://robotics.stanford.edu/~koller/index.html

Professor Donald Michie
http://www.aiai.ed.ac.uk/~dm/dm.html

The IJCAI Awards

The IJCAI Award for Research Excellence and the Computers and Thought Award are made by the IJCAII Board of Trustees, upon recommendation by the IJCAI Awards Selection Committee, which consists this year of

Michael Georgeff (San Francisco, USA)
Henry Kautz (Seattle, USA)
C. Raymond Perrault (Menlo Park, USA, Chair)
J. Ross Quinlan (Sydney, Australia)
Erik Sandewall (Linköping, Sweden)

The IJCAI Awards Selection Committee receives advice from members of the IJCAI Awards Review Committee, who comment on the accuracy of the nomination material and provide additional information about the nominees. The IJCAI Awards Review Committee is the union of the former Trustees of IJCAII, the IJCAI-01 Advisory Committee, the Program Chairs of the last three IJCAI conferences, and the past recipients of the IJCAI Award for Research Excellence and the IJCAI Distinguished Service Award, with nominees excluded.

IJCAII and AAAI Scholarship Programs

AAAI and IJCAII are pleased to announce the continuation of their Scholarship and Volunteer Programs for students interested in attending IJCAI-01. The U.S. Scholarship Program provides partial travel support and a complimentary technical program registration for students who are full-time undergraduate or graduate students at U.S. colleges and universities; are members of AAAI; submit papers to the technical program or letters of recommendation from their faculty advisor; and submit scholarship applications to AAAI by April 15, 2001. In addition, repeat scholarship applicants must have fulfilled the volunteer and reporting requirements for previous awards.

In the event that scholarship applications exceed available funds, preference will be given to students who have an accepted technical paper, and then to students who are actively participating in the conference in some way. However, all eligible students are encouraged to apply.

After the conference, an expense report will be required to account for the funds awarded. For further information about the U. S. Scholarship Program, or to obtain an application, please contact AAAI at scholarships@aaai.org, or 445 Burgess Drive, Menlo Park, California, 94025, USA; 650-328-3123 phone; 650-321-4457 fax.

Separate travel award programs are available for international students through IJCAII and other national societies. In addition, IJCAII will continue its travel support program for junior scientists from developing countries who have problems with currency conversion. For information regarding any of these international programs, please write to Priscilla Rasmussen at rasmusse@cs.rutgers.edu, or IJCAII, 75 Paterson Street, Suite 9, New Brunswick, NJ 08901, USA, +1-732-342-9100 phone, +1-732-342-9339 fax.

International students and junior scientists should first contact their local societies to see if support is available. If no other support is available, they may apply to IJCAII for support by submitting three copies of a letter of application which includes: 1) applicant name/address/email, 2) status of applicant (undergraduate, graduate student, junior faculty, etc.), 3) type of planned participation at IJCAI-01 (technical or workshop paper presentation, etc.), 4) an estimate of attendance costs, 5) whether other societies have been approached for support and result; any other sources of possible support, 6) a letter of support from the advisor (student applicants only). A post-conference report and receipts totaling at least the award amount will be

required to obtain the award after the close of the conference. The deadline for submission of applications is April 15, 2001 to Priscilla Rasmussen at the address above. Should applications exceed available funding, priority will be given to: 1) students presenting technical session papers, 2) junior scientists from developing countries or with unstable currencies presenting technical papers, 3) students presenting workshop papers, and 4) junior scientists or with unstable currencies from developing countries participating in the conference in other ways.

IJCAII and AAAI Volunteer Programs

All student scholarship recipients will be required to participate in the Student Volunteer Program to support IJCAI organizers in Seattle. The Volunteer Program is an essential part of the conference and student participation is a valuable contribution.

Students not requiring travel assistance should only apply for the Volunteer Program, which provides complimentary registration to full time students, including conference proceedings, in exchange for assisting IJCAI-01 organizers in Seattle. This program does not provide any scholarship funds, and is designed for local students or students who have other sources for travel funds. For further information regarding the Student Volunteer Program, please contact AAAI at volunteer@aaai.org. The deadline for volunteer applications is May 31, 2001.

AAAI/SIGART Doctoral Consortium

The sixth AAAI/SIGART Doctoral Consortium will be held Sunday and Monday, August 5-6, from 8:30 AM – 6:00 PM. The Doctoral Consortium provides an opportunity for a group of PhD students to discuss and explore their research interests and career objectives in an interdisciplinary workshop together with a panel of established researchers.

For more information about the AAAI/SIGART DC-2001, please visit:
http://sigart.ijcai-01.org/

Conference Program Description

The IJCAI-01 Conference is composed of various complementary Programs:

♦ the Technical Program, including technical paper presentations by top scientists in the field and invited speakers.

♦ the Tutorial Program (20 tutorials)

♦ the Workshop Program (29 workshops)

♦ the Exhibition, including the AAAI Robot Competition and Exhibition and National 2001 Botball Tournament (3 days)

COLLOCATED EVENTS

♦ the Thirteenth Conference on Innovative Applications of Artificial Intelligence, IAAI-01, August 7-9

♦ IJCAI-01 AAAI/SIGART Doctoral Consortium, August 5-6

♦ The RoboCup-2001 Competition will be held in the exhibit hall next to the IJCAI-01 Exhibition, August 2-10

♦ RoboCup-2001 Symposium, August 7 (additional registration fee)

♦ the Seventeenth Conference on Uncertainty in Artificial Intelligence (UAI 2001), August 2-5 (additional registration fee)

Wednesday, August 8

The IJCAII Business Meeting is held at each IJCAI Conference to allow all conference registrants to share in the ongoing operation of IJCAI, Inc. Please join us for an update on the state of IJCAII and to express your views about the organization, as well as the future of IJCAI Conferences.

IJCAI-01 Official Opening Ceremony and Reception

The Opening Ceremony will be held at the Washington State Convention & Trade Center on Monday, August 6, at 5:00 pm. The reception will be at the Museum of Flight, from 6:30 pm – 9:00 pm. The Opening Ceremony will be chaired by Hector Levesque, the Conference Chair of IJCAI-01. The reception will be hosted by The Boeing Company and Microsoft Corporation.

Museum of Flight

The Museum of Flight captures the story of flight from the dawn of aviation to the Space Age and houses 54 of the world's most historic airplanes — authentic and in mint condition. Dozens of full-size aircraft are suspended from the ceiling of the steel and glass Great Gallery and appear to fly overhead in formation. At ground level visitors can examine up close such intriguing airplanes as the Blackbird spy plane and America's first presidential jet — the original Air Force One. The magnificently restored "Red Barn," the birthplace of The Boeing Company, is an 80 year-old step back in history. Yet, from the hands-on air traffic control tower exhibit, which overlooks Boeing Field, today's prop planes and jumbo jets can be viewed coming and going.

IJCAI-01 Conference Banquet

Wednesday, August 8, 6:15-10:30 pm
Tillicum Village
Cost: $75 per person

The journey to Tillicum Village begins at Piers 55/56 on Seattle's Grand Central Waterfront, where attendees will board a charter vessel to Blake Island at 6:15 pm. The cruise on Puget Sound out to the island arrives at about 7:15 pm. Visitors will be greeted by a Native American drummer, and then enter the great cedar longhouse for an award-winning salmon feast. Tillicum Village salmon is cooked over an open fire on cedar stakes in the ancient Northwest Coast Native American fashion.

Following dinner, banquet attendees will enjoy "Dance on the Wind," a magnificent stage presentation that highlights some of the traditional dances, myths, and legends of the Northwest Coast in a magical and unforgettable setting. After "Dance on the Wind", the natural riches of Blake Island State Park can be enjoyed on its beautiful beaches and trails.

The Tillicum Village facility, which is a traditionally styled Northwest Coast Native American cedar longhouse, has many artifacts on display. The Gift Gallery in the longhouse has items that represent several different tribes, as well as many unique items crafted by Tillicum Village staff members.

At 9:30 pm attendees will board the chartered vessel at Blake Island marina for the return trip to Seattle and Piers 55/56, arriving back in Seattle at about 10:30 pm. The return trip offers magnificent views of the Seattle skyline from the beautiful waters of Elliott Bay.

Keynote Address

Bill Gates,
Microsoft Corporation

AI in the Computing Experience: Challenges and Opportunities

Tuesday, August 7 • 11:40 a.m. – 12:40 p.m.

Bill Gates is chairman and chief software architect of Microsoft Corporation, the worldwide leader in software, services and Internet technologies for personal and business computing. The company is committed to a long-term view, reflected in its investment of more than $3 billion on research and development in the current fiscal year. Under Gates' leadership, Microsoft's mission has been to continually advance and improve software technology and to make it easier, more cost-effective and more enjoyable for people to use computers.

Conference-at-a-Glance

CONFERENCE DAY	MORNING	AFTERNOON	EVENING
Thursday, August 2	UAI 2001		
Friday, August 3	UAI 2001		
		Registration *(opens at 1:00 pm)*	
Saturday, August 4	Registration		
	Workshops *(see page 16)*		
	RoboCup		
	UAI 2001		
Sunday, August 5	Registration		
	Workshops		
	Tutorials *(see page 10)*		
	AAAI/SIGART Doctoral Consortium		
	RoboCup		
	UAI 2001		
Monday, August 6	Registration		
	Workshops		
	Tutorials		
	AAAI/SIGART Doctoral Consortium		
	RoboCup		
			Opening Ceremony, Reception
Tuesday, August 7	Registration		
	Technical Program *(starts at 8:30 am)*		
	Keynote Speaker		
	IAAI-01		
	Exhibition/Robot Competition		
	RoboCup Symposium & RoboCup Junior		Computers and Thought Lecture
Wednesday, August 8	Registration		
	Technical Program		
	Special Events *(see IJCAI-01 web site)*		
	IAAI-01		
	Exhibition/Robot Competition		
	RoboCup Symposium & RoboCup Junior		Conference Banquet
Thursday, August 9	Registration		
	Technical Program		
	IAAI-01		
	Exhibition/Robot Competition/Botball		
	RoboCup		
	IJCAII Business Meeting		
			Research Excellence Lecture
Friday, August 10	Registration		
	Technical Program — Special Events — Technical Program		
	RoboCup		

Invited Speakers

Philip R. Cohen, Center for Human-Computer Communication, Oregon Graduate Institute

Multimodal Interaction: Principles, Practice, Impact, and Challenges

A new generation of multimodal systems is emerging in which the user is able to employ natural communication modalities, including spoken language and pen-based gesture, in addition to the usual graphical user interface technologies. To build such systems, we adopt the principle of using the strengths of one modality to overcome weaknesses in another. We discuss how to design multimodal systems according to this principle, and how to build robust multimodal architectures that employ it at runtime in a unification-based framework. These design and architectural principles will be illustrated through QuickSet — a handheld, collaborative, multimodal system that allows continuous speech and pen-based gesturing as input. QuickSet uses a fault-tolerant distributed agent architecture, runs on PC's, and is scalable from wearable to wall-sized systems. To assess the impact of multimodal interaction, we will describe a study comparing the use of a map-based graphical user interface and multimodal interaction. After discussing reasons why graphical user interfaces fail to satisfy users in high stress environments, we present a new version of the QuickSet technology that attempts to support them through a tangible multimodal user interface. Finally, we will discuss the challenges that await researchers when we try to support multimodal interaction among people.

Philip R. Cohen received his B.A. degree in mathematics from Cornell University, and his M.Sc. and Ph.D. degrees in computer science from the University of Toronto. Dr. Cohen has been a researcher or faculty member at Bolt Beranek and Newman, Inc., the Oregon State University, the University of Illinois, Fairchild Laboratory for Artificial Intelligence Research, and SRI International. He is currently Professor and Co-Director of the Center for Human-Computer Communication in the Dept. of Computer Science and Engineering at the Oregon Graduate Institute. His research interests include multimodal interaction, multiagent systems, dialogue, natural language processing, and theories of collaboration and communication. Cohen is currently Past President of the Association for Computational Linguistics, and is a Fellow of the American Association for Artificial Intelligence.

Joseph Y. Halpern, Cornell University

Plausibility Measures: A General Approach for Representing Uncertainty

Halpern discusses a new formalism for reasoning about uncertainty called plausibility. Plausibility is a generalization of probability: the plausibility of a set is just an element of some arbitrary partial order (instead of being an element of [0,1], as in the case of probability). Halpern shows that plausibility can be used to give insight into belief and belief change, default reasoning, decision rules, and (if time permits) when the technology of Bayesian networks can be applied to a representation of uncertainty. Some of this is joint work is with Nir Friedman.

Joseph Y. Halpern received a Bs.C. in mathematics from the University of Toronto in 1975 and a Ph.D. in mathematics from Harvard in 1981. In between, he spent two years as the head of the Mathematics Department at Bawku Secondary School, in Ghana. After a year as a visiting scientist at MIT, he joined the IBM Almaden Research Center in 1982, where he remained until 1996; he was also a consulting professor at Stanford during that time. He then moved to Cornell University, where he is a professor in Computer Science and co-director of the Cognitive Studies program.

His major research interests are in reasoning about knowledge and uncertainty, qualitative reasoning, belief revision, (fault-tolerant) distributed computation, game theory, decision theory, and security. Together with his former student, Yoram Moses, he pioneered the approach of applying reasoning about knowledge to analyzing distributed protocols and multi-agent systems. He has coauthored 5 patents, a book ("Reasoning about Knowledge"), and well over 100 technical publications.

Halpern was program chairman and organizer of the first conference on Theoretical Aspects of Reasoning about Knowledge, and program chairman of the fifth ACM Symposium on Principles of Distributed Computing, the 23rd ACM Symposium on Theory of Computing, and the 16th IEEE Symposium on Logic in Computer Science. He received the Publishers' Prize for Best Paper at the International Joint Conference on Artificial Intelligence in 1985 (joint with Ronald Fagin) and in 1989, the 1997 Godel Prize (joint with Yoram Moses), and two IBM Outstanding Innovation Awards. He is a Fellow of the American Association for Artificial Intelligence. He is editor-in-chief of Journal of the ACM, and also serves on the editorial board of Information and Computation, Journal of Logic and Computation, Chicago Journal of Theoretical Computer Science, and Artificial Intelligence.

Manuela Veloso, Carnegie Mellon University

The Challenges and Advances in Teams of Autonomous Agents in Adversarial Environments

The research and development of teams of intelligent software agents and robots have fascinated RoboCup researchers for the last five years. We have actively researched on the integration of reasoning, perception, and action in teams of agents that need to face adversarial environments. Robotic soccer offered a pioneering concrete task for this research, both for software agents and robots. RoboCup today involves several new directions, including simulation and robot rescue tasks and humanoid robots. In this talk, Veloso will go in detail over the research challenges underlying teams of distributed software agents, small robots with off-board vision and computer control allowed, and fully autonomous robots and Sony legged robots. We have witnessed RoboCup significantly advancing the scientific state of the art of multiagent and multirobot systems. Veloso will introduce the main contributions, including robot design, multiagent learning, behavior architectures, perception, communication, localization, and opponent behavior modeling and recognition.

Manuela M. Veloso is Associate Professor of Computer Science at Carnegie Mellon University. She received her Ph.D. in Computer Science from Carnegie Mellon University in 1992, and a degree in Electrical Engineering in 1980, and an M.Sc. in Electrical and Computer Engineering in 1984 from the Instituto Superior Tecnico in Lisbon. Her long-term research goal aims at the investigation and effective development of teams of intelligent agents, in which cognition, perception, and action are combined to address planning, execution, and learning tasks, in particular in uncertain, dynamic, and adversarial environments. With her students, Prof. Veloso has developed teams of robotic soccer agents in three different RoboCup leagues, researching on fully autonomous simulation and robot agents, and in visual-servoed computer-controlled robots. She received the NSF Career Award in 1995 and the Allen Newell Medal for Excellence in Research in 1997. Professor Veloso is Vice-President of the International RoboCup Federation.

Invited Speakers

Wolfgang Wahlster,
German Research Center for
Artificial Intelligence (DFKI),
Germany

Robust Translation of Spontaneous Speech: A Multi-Engine Approach

Verbmobil is a speaker-independent and bidirectional speech-to-speech translation system for spontaneous dialogs that can be accessed via GSM mobile phones. It handles dialogs in three business-oriented domains, with context-sensitive translation between four languages (English, German, Japanese, and Chinese). We show that in Verbmobil's multi-blackboard and multi-engine architecture the results of concurrent processing threads can be combined in an incremental fashion. We argue that all results of concurrent processing modules must come with a confidence value, so that statistically trained selection modules can choose the most promising result. Packed representations together with formalisms for underspecification capture the uncertainties in each processing phase, so that the uncertainties can be reduced by linguistic, discourse and domain constraints as soon as they become applicable. One of the main lessons learned from the Verbmobil project is that the problem of speech-to-speech translation can only be cracked by the combined muscle of deep and shallow processing approaches.

Professor Wolfgang Wahlster is the Director of the German Research Center for Artificial Intelligence (DFKI). He has published more than 150 technical papers and five books on intelligent user interfaces. His current research includes multimodal interfaces, user modeling, speech translation, and life-like presentation agents. He has been the Scientific Director of the VERBMOBIL consortium on spontaneous speech translation (1993-2000), the largest AI project in Europe with more than 100 researchers. He has served as the Chair of IJCAII from 1991-1993, of ECCAI from 1996-2000, and as the President of ACL in 2000. Professor Wahlster is a Fellow of AAAI and ECCAI, a recipient of the Fritz Winter Award, and the European Information Technology Award. In 1998, he has been awarded the degree of Doctor Honoris Causa by Linköping University, Sweden. In 2000, he was the first AI researcher to receive the Beckurts Award, Germany's most prestigious award for scientific innovations.

Distinguished Paper Track

In order to give IJCAI attendees a better picture of what is going on in the various subareas of AI, and to counter the fragmentation of the field, some of the most distinguished recent papers from international conferences in robotics, vision, knowledge representation, machine learning, planning and other areas have been selected to be presented again at IJCAI. To make these research results accessible to a general AI audience, a significantly extended presentation of each of them will be given.

Tutorial Program & Descriptions

The IJCAI tutorial program for 2001 features 20 four-hour tutorials, each covering a concentrated technical topic of current or emerging interest. Tutorials will be presented by experienced researchers and practitioners expert in the corresponding subject area. A separate registration fee applies to each tutorial. Tutorials designated

(**SA**) will be held Sunday, August 5, from 9:00 am – 1:00 pm.

(**SP**) tutorials will be held Sunday, August 5, from 2:00 – 6:00 pm.

(**MA**) tutorials will be held Monday, August 6, from 9:00 am – 1:00 pm.

(**MP**) tutorials will be held Monday, August 6, from 2:00 – 6:00 pm.

TUTORIAL OVERVIEW

Sunday • August 5		Monday • August 6	
SA 9 a.m. – 1 p.m.	**SP** 2 p.m. – 6 p.m.	**MA** 9 a.m. – 1 p.m.	**MP** 2 p.m. – 6 p.m.
(SA1) AI Techniques for Knowledge Management Stefan Decker and Steffen Staab	**(SP1)** Agent Communication in Knowledge Based Electronic Markets Benjamin Grosof and Yannis Labrou	**(MA1)** Search Algorithms for Quantum Computers Tad Hogg	**(MP1)** Ant Algorithms and Swarm Intelligence Marco Dorigo
(SA2) Economically Founded Multiagent Systems Tuomas Sandholm	**(SP2)** Computer Games Michael van Lent and John E. Laird	**(MA2)** Distributed Knowledge-Based Search Jörg Denzinger	**(MP2)** Integration of Operations Research and AI Constraint-Based Techniques for Combinatorial Optimization Michela Milano
(SA3) Neural Networks for Pattern Recognition: The Impact of Architecture Miroslav Kubat	**(SP3)** Philosophical Foundations: Some Key Questions Aaron Sloman and Matthias Scheutz	**(MA3)** Empirical Methods in CS and AI Paul Cohen, Ian Gent, and Toby Walsh	**(MP3)** Knowledge Markup and Resource Semantics Harold Boley, Stefan Decker, and Michael Sintek
(SA4) Phase Transitions and Structure in Combinatorial Problems Carla P. Gomes, Tad Hogg, Toby Walsh, and Weixiong Zhang	**(SP4)** Stochastic Search Algorithms Holger H. Hoos and Thomas Stützle	**(MA4)** Integrating Lisp with the World Vladimir A. Kulyukin	**(MP4)** Practical Machine Learning for Software Tim Menzies
(SA5) Question Answering Dan Moldovan and Sanda Harabagiu	**(SP5)** Systems that Adapt to their Users Anthony Jameson	**(MA5)** Machine Learning for Categorization of Text Documents and Web Pages Fabrizio Sebastiani & Alessandro Sperduti	**(MP5)** Tractability in Qualitative Spatial and Temporal Reasoning Frank Anger, Hans Guesgen, and Gerard Ligozat

Tutorial Descriptions

Speaker biographies can be found at www.ijcai-01.org.

SA 1

AI Techniques for Knowledge Management

Stefan Decker and Steffen Staab

Knowledge management (KM) is a discipline with the purpose of managing the knowledge assets of organizations. Though KM is deeply rooted in business management, IT support may add an enormous leverage for the effortless creation, conservation, sharing, and exploitation of organizational knowledge. AI has a long tradition in creating, interacting with and managing of knowledge and has developed many techniques that may propel this knowledge management cycle inside an organization. In the tutorial, we will give an introduction in intelligent IT support for Knowledge Management that individual and communities of users in knowledge-intensive organizations may benefit from.

Prerequisites: Participants should have some general IT knowledge and basic knowledge about AI.

SA 2

Economically Founded Multiagent Systems

Tuomas Sandholm

In multiagent systems for agent-mediated electronic commerce, computational agents find contracts on behalf of the real-world parties that they represent. This saves human negotiation time, and computational agents are often better at finding beneficial deals in combinatorially and strategically complex settings. Applications include supply chain coordination, electricity markets, bandwidth allocation, vehicle routing among dispatch centers, and resource allocation in distributed operating systems, to name just a few.

Tutorial Program & Descriptions

A key goal is to design open distributed systems in a principled way that leads to globally desirable outcomes even though every participating agent only considers its own good and may act insincerely. The tutorial covers relevant AI and game theory topics in voting, auctions (also multi-unit, multi-item, and many-to-many exchanges), and automated contracting. Emphasis is given to fundamental results and algorithms. Effects of computational limitations (agents' bounded rationality) are discussed as a key feature that has not received adequate attention. Implementation experiences will be shared, and real world applications presented.

No background is required in economics, game theory or multiagent systems.

SA3

Neural Networks for Pattern Recognition: The Impact of Architecture

Miroslav Kubat

Artificial neural networks rank among the most popular tools in pattern recognition. Their widespread use was boosted by algorithms for learning from examples. A challenging research issue is how to establish, for a given task, appropriate neural architecture: small networks are prone to get trapped in local minima, whereas large networks tend to overfit the training examples.

Historically, researchers relied on trial-and-error procedures, experimenting with several topologies, and then selecting the one that best satisfied predefined criteria. In the 1990s, more systematic techniques emerged. They can roughly be divided into three categories. Search-based strategies that exploit AI-search techniques, including the genetic algorithm; logic-based strategies that utilize prior knowledge expressed as production rules or decision trees; and piecemeal strategies that focus on one neuron at a time.

The tutorial begins with a systematic introduction into networks consisting of mutually interconnected layers of neurons. Then, the techniques for their architectural design will be investigated. Due attention is devoted to experience from major projects. No special prerequisite knowledge is required.

SA4

Phase Transitions and Structure in Combinatorial Problems

Carla P. Gomes, Tad Hogg, Toby Walsh, and Weixiong Zhang

This tutorial will present an exciting area combining concepts from theoretical physics and artificial intelligence. We will show how the study of phase transition, structure, and related phenomena is changing the way we characterize the computational complexity of combinatorial problems, beyond the notion of worst-case complexity. Furthermore, we will discuss how we can use tools from statistical physics to provide a much more detailed description of a problem's complexity and how we can leverage such insights into the design of search algorithms.

We will describe phase transition behavior observed in a number of different decision problems such as SAT, graph coloring, and number partitioning, as well as optimization problems such as TSP and maximum SAT, and in other complexity classes like P and PSpace. The second part of the tutorial will cover recent work connecting structural features of problems with phase transition phenomena and computational complexity. Topics covered will include constrainedness, backbone structure, and small world topology. We will also discuss how to exploit structure and randomness in problems using restart strategies and, more generally, portfolios of algorithms.

The tutorial is aimed at the general AI audience. Familiarity with some basic concepts of combinatorial optimization, probability theory, and computational complexity is desirable but not essential. Please visit http://www.cs.wustl.edu/~zhang/links/ijcai-phase-transitions.html

SA5

Question Answering

Dan Moldovan and Sanda Harabagiu

Question Answering (QA) is a fast growing area of research with tremendous commercial potential. The problem of QA is to find answers to open-domain questions by searching a large collection of documents. Unlike Internet search engines, QA systems provide short, relevant answers to questions.

The recent explosion of information available on the World Wide Web makes question answering a compelling framework for finding information that closely matches user needs. Due to the fact that both questions and answers are expressed in natural language, QA methodologies deal with language ambiguities and incorporate NLP techniques.

The tutorial presents a survey of the most performant open-domain QA systems architectures and the basic techniques employed to build them. Topics include: answer taxonomies, answer processing, document retrieval, answer extraction and ranking, accuracy performance and speed performance.

SP1

Agent Communication in Knowledge Based Electronic Markets

Benjamin Grosof and Yannis Labrou

Background: Electronic markets (e-markets) for the buying and selling of goods and services over the Web are a fast-growing, multi-billion-dollar segment of the world economy. Relevant knowledge-based techniques draw on several areas of AI: knowledge representation and reasoning, learning, and communication. As more knowledge-based pieces of e-commerce have developed, issues are arising of how to put them together into overall functioning markets — largely, via forms of

agent communication. E-markets include infrastructural and intermediary services, e.g., for yellow pages, catalogs, shopping search, advertising, sales assistants, brokers/aggregators, infomediaries, reputation/trust, authentication, and payments. Intelligent software agents in this context are autonomous, cooperating processes that use rich agent communication languages to exchange information and knowledge and to coordinate their activities.

This tutorial will discuss existing techniques and their theory, currently identified challenges, standardization efforts and near-future opportunities for practical applications of agent communication in knowledge-based e-markets. Here, knowledge-based techniques for agent communication, ontologies, business rules, and information integration are of rising interest, in part due to the rise of XML, and have started having practical impact on real e-markets. The tutorial includes a brief review of several agent-based projects that are using these emerging standards.

For more detailed and updated information on the content of the tutorial, and more detailed speaker bios, see the link at http://www.mit.edu/~bgrosof/ .

Prerequisites:

Basic general AI knowledge, in particular especially the basics of rule-based knowledge representation, is assumed.

SP2

Computer Games

John E. Laird and Michael van Lent

Computer games are becoming a major application area of AI. Although games have traditionally used very simple AI, the computer game industry is seeing a significant increase in available CPU power as graphics processing has moved into special purpose processors. We can expect a significant increase in the complexity and importance of AI with computer games. This tutorial provides a broad overview of computer and video games for the AI researcher interested in learning more about the business and technology of computer games. The major topics that are covered include:

♦ The history of computer games from early time-sharing up through today's consoles.

♦ The business of computer games including the major market forces and industry trends.

♦ Current computer game technology, including the hardware and software systems used in developing and delivering computer games.

♦ The design and development of computer games and a discussion of good gameplay: what makes a game fun to play.

♦ The fundamentals and theory of computer games including graphics, physics, AI, sound, and networking.

♦ An example of AI research in computer games.

SP3

Philosophical Foundations: Some Key Questions

Aaron Sloman and Matthias Scheutz

This tutorial, presented by tutors with considerable experience in both philosophy and AI, will introduce philosophical problems relevant to the goals and methodology of AI as science and AI as engineering, including the contribution of AI to the study of mind. The mode of presentation will be a mixture of lectures and interactive discussions, addressing the following topics:

♦ What are virtual machines and how are they related to physical machines?

♦ Can the relations between virtual and physical machines as understood by software engineers shed light on philosophical questions about relations between minds and brains?

♦ Can mental events, or events in virtual machines, have causal powers?

♦ What sorts of virtual machines can biological evolution produce?

♦ What sorts of VM architectures can support ontologies including beliefs, desires, pleasures, pains, decisions and other mental events and processes?

♦ Under what conditions might it be reasonable to describe a machine as conscious, or as having emotions, or as using representations?

♦ Can animals or robots, with different information processing architectures be describable using similar mental concepts?

A more detailed overview of the tutorial will be available online at http://www.cs.bham.ac.uk/~axs/ijcai01/

Prerequisite knowledge:

Knowledge of AI and experience of software development will help.

SP4

Stochastic Search Algorithms

Holger H. Hoos and Thomas Stützle

Stochastic search algorithms have been shown to outperform their deterministic counterparts in a number of interesting application domains. They are becoming increasingly important and popular for solving computationally hard combinatorial problems from various domains of AI and Operations Research, such as planning, scheduling, constraint satisfaction, and satisfiability.

In this tutorial we will introduce stochastic search algorithms and characterise them as instances of the more general class of Las Vegas algorithms. We will cover local search algorithms, including stochastic hill-climbing, simulated annealing, tabu search, evolutionary algorithms, and ant colony optimization, as well as randomised systematic search algorithms. For exemplifying these algorithms, we will mainly use the satisfiability problem in propositional logic (SAT) and the Travelling Salesman problem (TSP), which both play a central role in the design, implementation, and analysis of algorithmic ideas. We will also address the empirical analysis of Las Vegas algorithms and present case studies demonstrating the successful application of stochastic search algorithms to various problem domains.

Prerequisite knowledge:

The attendees should have an interest in computationally hard combinatorial problems. Basic knowledge in standard AI search problems as well as a basic knowledge of search methods would be an advantage but is not a necessary prerequisite.

Tutorial Program & Descriptions

SP5

Systems that Adapt to their Users

Anthony Jameson

Interactive systems that adapt to their users have been gaining rapidly in practical importance, for example in the areas of e-commerce and web-based information access. Relevant terms include personalization, personal assistants, adaptive interfaces, user modeling, and student modeling. The AI techniques employed include machine learning techniques, probabilistic and decision-theoretic approaches, and logic-based methods.

Although user-adaptive systems take many different forms, there are a number of questions that must be addressed in the design of any such system:

1. What functions are to be served by the adaptation?

2. What properties of the user should be modeled?

3. What input data about the user should be obtained, and how?

4. What techniques should be employed to make inferences about the user?

5. How should decisions about appropriate adaptive system behavior be made?

6. What empirical studies should be conducted?

For each of these questions, we will systematically examine the main answers that have been worked out so far in research and practice. The discussion will integrate the results of previous experience in many different domains from an AI perspective, and it will refer throughout to concrete system examples.

Prerequisite Knowledge: This tutorial will be accessible to all IJCAI 2001 attendees.

MA1

Search Algorithms for Quantum Computers

Tad Hogg

Quantum computers factor integers in polynomial time, a problem thought to be intractable for conventional machines. More relevant for AI is how rapidly they solve NP-hard combinatorial searches. Although unlikely to efficiently solve all NP problems, heuristic algorithms for quantum computers may offer substantial improvement for many searches that arise in practice by operating on the entire search space at once. Furthermore, heuristics pose less stringent hardware requirements than algorithms ignoring problem structure, thereby reducing the formidable challenge of building these machines.

This tutorial will describe the capabilities of quantum computers, e.g., testing exponentially many search states in about the same time conventional machines test just one. Attendees will learn how to use these capabilities for search through a variety of examples including a heuristic for random 3-SAT near a phase transition in typical search cost. The tutorial will also cover theoretical and empirical techniques for evaluating such algorithms and a variety of open research questions that the AI community is well positioned to address.

The tutorial will assume some knowledge of combinatorial searches, such as SAT, and heuristic methods, such as hill-climbing and GSAT. Familiarity with quantum mechanics is not required.

For further information see

http://www.parc.xerox.com/hogg/ijcai01.html

MA2

Distributed Knowledge-Based Search

Jörg Denzinger

With the increasing availability of multiprocessor computers and networks of computers the wish to use the massive computing power provided by them has become stronger and stronger. With the maturity of the field multi-agent systems, we now have the conceptual and modeling tools to adequately describe and compare different approaches to solve AI problems while employing the additional "dimension" of teams of computers. Knowledge-based search is at the core of many AI systems and even a number of systems that have found their way into "mainstream" computer science, such as scheduling systems and many standard optimization systems.

This tutorial will provide a unified view on different concepts used to distribute knowledge-based search. We will introduce distributed search systems as cooperative multi-agent systems and concentrate on the communication and organization requirements of such systems. The general ideas behind the known distributed search systems will be presented within this multi-agent framework, and the systems will be classified into different categories.

For each category, we will present its basic idea independent from a particular application. We will present one typical homogeneous and one typical heterogeneous distribution concept for each category. Finally, we will discuss and compare the requirements, limitations, advantages and disadvantages of the different categories.

Prerequisite knowledge: The tutorial is suitable for a general AI audience, both academic and industrial. Knowledge of some basic search algorithm schemes would be helpful, but it is not essential.

Tutorial Program & Descriptions

MA3

Empirical Methods in CS and AI
Paul Cohen, Ian Gent, and Toby Walsh

This tutorial will cover the basic principles of empirical studies, and methods for exploratory data analysis, experiment design, hypothesis testing, and modeling. We will cover the entire lifecycle of empirical studies, including the exploratory phase, which is usually not reported, and the phase in which a research question (why you are running the study in the first place) is turned into an experiment design. While this is not a crash course in statistical methods, we will introduce hypothesis testing and computer intensive statistical methods — a new family of tools particularly appropriate for AI research. Finally we will address questions that arise when trying to publish empirical work. Throughout, we will use examples from our own research: positive examples of good practice, and negative examples to demonstrate what not to do! The tutorial will be suitable to a general AI audience, as very little background knowledge is assumed and the empirical methods discussed are generally useful. It builds upon the successful tutorial of the same theme presented at AAAI-2000.

MA4

Integrating Lisp with the World
Vladimir A. Kulyukin

The rapid growth of diverse software technologies has made it hard and oftentimes impossible to develop sophisticated systems in one programming language. Lisp has been the language of choice for AI researchers and practitioners for over two decades. Yet the AI community has paid little to the integration of Lisp with mainstream development tools. As a consequence, these tools have started claiming the Lisp territory.

The purpose of this tutorial is to show that AI researchers and developers can and should use Lisp in conjunction with such mainstream languages as Java and C++. The tutorial will demonstrate how Lisp can utilize specific functionalities available through C++ and Java, and how C++ and Java can utilize software components written in Lisp. A special emphasis will be placed on CORBA, COM, and foreign function interfaces. Examples will include information retrieval, natural language processing, and robot control.

The tutorial will be of interest to researchers and developers who want to integrate Lisp-based solutions into applications written in mainstream languages. The tutorial will also be relevant to researchers and practitioners who want to master distributed computing with COM and CORBA.

Prerequisite Knowledge : Familiarity with Common Lisp. Knowledge of the Allegro Common Lisp IDE is helpful but not essential.

MA5

Machine Learning for Categorization of Text Documents and Web Pages
Fabrizio Sebastiani & Alessandro Sperduti

In this tutorial we look at the main approaches that have been taken towards automatic text categorization within the general machine learning paradigm. A general presentation of the basic issues in document categorization will be followed by the presentation of basic (such as linear separators, decision trees, etc.) and advanced machine learning concepts and techniques (such as boosting, support vector machines, etc.). Then issues pertaining to document indexing, classifier construction, and classifier evaluation, will be discussed in detail, and a review of the current most relevant research in text categorization by machine learning tools will be presented. Finally, the special case of automatic classification of Web pages is considered and the concepts and techniques specifically devised for this case are discussed.

We assume that the attendants will be familiar with basic knowledge of linear algebra, calculus, and probability.

MP1

Ant Algorithms and Swarm Intelligence
Marco Dorigo

Ant colonies, and more generally social insect societies, are distributed systems that in spite of the simplicity of their individuals present a highly structured social organization. As a result of this organization, ant colonies can accomplish astonishingly complex tasks that in some cases far exceed the individual capacities of a single ant. The study of ant colonies behavior and of their self-organizing capacities is interesting for computer scientists because it provides models of distributed organization which are useful to solve difficult optimization and distributed control problems.

This is particularly true in application environments in which rapid and autonomous adaptation to environmental changes, as well as robustness to system failures, are important features. In this tutorial I will present some models derived from the observation of real ants and other insect societies, and I will explain how these models can be used to design multi-agent systems for the solution of problems like distributed and adaptive routing in Internet-like networks, combinatorial optimization, optimal allocation of resources, and distributed task allocation in a fleet of autonomous robots.

MP2

Integration of Operations Research and AI Constraint-Based Techniques for Combinatorial Optimization
Michela Milano

The tutorial provides an overview of recent directions in the integration of Mathematical Programming (MP) techniques, used in Operations Research (OR), and

Tutorial Program & Descriptions

Artificial Intelligence Constraint Satisfaction (CS) techniques for facing Combinatorial Optimization Problems (COPs).

The tutorial starts by reviewing basic concepts in COPs, CS, and Constraint Programming (CP). Participants are assumed to have some familiarity with these preliminaries. OR concepts are described in more detailed since we do not require any prerequisite knowledge on the field. We describe (Mixed) Integer Programming and Linear Programming, their geometrical properties, and solving algorithms; cutting planes generation techniques are presented, branch-and-bound and branch-and-cut frameworks discussed; finally column generation approaches are introduced. The aim of this introduction is not to provide details on how these techniques are implemented, but rather to explain how results can be exploited from a software engineering viewpoint.

In the second part, we compare Constraint Satisfaction and Optimization Problems, underlining differences and similarities from a modeling and solving perspective. In the third part, we describe approaches toward integration that have been investigated to date, again from a modeling and solving viewpoint. Finally, we discuss open problems and research directions. We provide references to recent literature throughout.

MP3
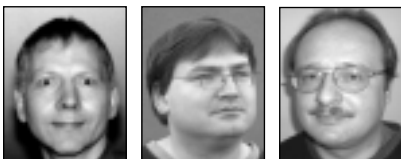
Knowledge Markup and Resource Semantics

Harold Boley, Stefan Decker, and Michael Sintek

Semi-formal and formal knowledge on the Web attracts increasing numbers of content providers, and much of the ongoing formalization can be done with AI knowledge representation techniques and by AI people. This tutorial introduces techniques for _knowledge markup_: how to map formal AI representations (e.g., logics and frames) to XML. It also explains _resource semantics_: how to describe heterogeneous Web resources using AI-inspired semantic RDF metadata. We survey existing XML and RDF

applications for knowledge bases/ontologies, deal with the acquisition and processing of these representations, go into agent architectures built around XML or RDF, and detail selected applications. A special emphasis will

be on current efforts to define a shared markup language for realizing Tim Berners-Lee's "Semantic Web" vision (e.g., DAML and OIL). After the tutorial, participants will have absorbed the theoretical foundations as well as the practical use of knowledge markup and resource semantics; they will also be able to assess proposed XML and RDF applications for AI and to identify further applications of these techniques. Participants should have some previous experience with knowledge representations (logics or frames) and markup languages (e.g., HTML).

MP4

Practical Machine Learning for Software

Tim Menzies

Machine learning (ML) is not hard and should be a standard part of any software engineer's toolkit. Software engineers can use machine learners to simplify systems development. This tutorial explains how to use ML to assist in the construction of systems that support classification, prediction, diagnosis, planning, monitoring, requirements engineering, validation, and maintenance. Case study material will be presented using examples from software fault estimation, software time estimation, software risk reduction, decision support systems for geologists, medical diagnostic systems, electrical diagnosis systems, and reverse engineering.

This tutorial is industrial practitioner-oriented. For example, most of its material is suitable for the AI-novice or the technical manager of software engineering projects. Also, the tutorial explores how to use machine learning in {\em data-starved} domains; lacks the large data sets needed traditional machine learning. Many software engineering companies operate in such data-starved domains, particularly the newer, smaller dot-com software companies. In such data-starved domains, learning must be preceded by a modeling process to generate a model we can use to generate data sets. Machine learning for software engineering is practical when both the modeling and learning stages are simple and inexpensive. This tutorial presents such simple and inexpensive techniques.

MP5

Tractability in Qualitative Spatial and Temporal Reasoning

Frank Anger, Hans Guesgen, & Gerard Ligozat

The field of qualitative temporal reasoning has been around in AI at least since Allen's pioneering work 20 years ago. More recently, similar approaches have been introduced for reasoning about space. Some general threads have emerged, especially as far as complexity problems are concerned; hence an integrated presentation of the basic results becomes feasible in a systematic way.

The potential applications of the field include natural language understanding, planning, GIS, robotics, automatic mail processing, and human-machine communication, among others.

This tutorial will guide practitioners by describing the main methods and results in the field. It will introduce researchers and graduate students to an area with exciting open problems and perspectives.

Prerequisite knowledge:
The tutorial assumes only a basic knowledge of AI and Knowledge Representation techniques. The logical notions will be introduced when required.

Workshop Program (By Invitation Only)

The workshops will take place Saturday, August 4 – Monday, August 6. They are arranged in nine tracks or themes. Participation is limited to those invited by the workshop organizers prior to the conference. Detailed descriptions & submission guidelines can be found on the IJCAI-01 web site.

Track	Saturday • August 4	Sunday • August 5	Monday • August 6
Track "Agent" Agent-Based Systems		**AGENT-1:** Spatial and Temporal Reasoning with "Agents" Focus	**AGENT-2:** Autonomy, Delegation, and Control: Interacting with Autonomous Agents
			AGENT-3: Economic Agents, Models, and Mechanisms
Track "CON" Constraints	**CONS-2:** Distributed Constraint Reasoning	**CONS-1:** Modeling and Solving Problems with Constraints	
Track "KRR" Knowledge Representation and Reasoning	**KRR-2:** Abductive Reasoning	**KRR-3:** Nonmonotonic Reasoning, Action and Change	
			KRR-1: Knowledge Management and Organizational Memories
			KRR-4: Inconsistency in Data and Knowledge
Track "ML" Machine Learning and Data Mining	**ML-5:** Wrappers for Performance Enhancement in KDD	**ML-1:** Adaptive Text Extraction and Mining	**ML-2:** Learning from Temporal and Spatial Data
			ML-3: Text Learning: Beyond Supervision
			ML-4: Knowledge Discovery from Distributed, Dynamic, Heterogeneous, Autonomous Data & Knowledge Sources
Track "ONTOL" Ontologies	**ONTOL-1:** Ontology Learning		
	ONTOL-2: Ontologies and Information Sharing		**ONTOL-3:** IEEE Standard Upper Ontology
Track "PRO" Planning and Robotics	**PRO-1:** Reasoning with Uncertainty in Robotics		**PRO-2:** Planning under Uncertainty and Incomplete Information
	PRO-3: Planning with Resources		
Track "TASK" Task-centered	**TASK-1:** AI in Mobile Systems	**TASK-3:** AI and Manufacturing	**TASK-2:** Configuration
		TASK-4: Knowledge and Reasoning in Practical Dialogue Systems	
Track "WEB" Web	**WEB-2:** Intelligent Techniques for Web Personalization	**WEB-1:** E-business and the Intelligent Web	
Other Topics	**OTTO-2:** Empirical Methods in AI	**OTTO-3:** Effective Interactive AI Resources	**OTTO-1:** Stochastic Search Algorithms

Exhibit Program: The Mobile Robot Competition & Exhibition / National Botball 2001 Tournament

In conjunction with the conference there will be an exhibition illustrating AI techniques as obvious elements of most technologies today. The exhibition will create a stimulating and supporting supplement to the conference and make an informal meeting place for the participants.

Selected companies and research projects will participate as exhibitors together with some of the most important multinational industrial companies and publishers. Corporate sponsors will also have the opportunity to demonstrate their products in a special demo session. Please contact ijcai@aaai.org for more information about exhibiting.

The Robot Competition and Exhibition

This year's IJCAI will include several events showing off the communities' work in intelligent robotics. Events will cover both research and applied robot systems.

The Ninth Annual AAAI Mobile Robot Competition and Exhibition brings together teams from universities and other research laboratories to compete, and also to demonstrate state-of-the-art research in robotics and AI. The goals of the Competition and Exhibition are to:

♦ Foster the sharing of research ideas and technology

♦ Allow research groups to showcase their achievements

♦ Encourage students to enter the fields of robotics and AI

♦ Increase awareness of the field

This year, two of the AAAI events will be held jointly with RoboCup. The Competition and Exhibition comprises three separate events:

Contest

The contest allows teams to show off their best attempts at solving common tasks in a competitive environment. Teams compete for place awards as well as for technical innovation awards, which reward particularly interesting solutions to problems. There will be two contest events this year: Hors d'oeuvres and Search and Rescue. The Search and Rescue event is joint with RoboCup.

Exhibition

The exhibition gives researchers an opportunity to demonstrate state-of-the-art research in a less structured environment. Exhibits are scheduled through several days of the conference, and in addition to live exhibits, a video proceedings is produced.

Workshop

The robot events culminate with a workshop where participants describe the research behind their entries. For more information:

http://www.cs.cmu.edu/~aaai00

Organizing Chairs:

General Cochairs: Tucker Balch, Carnegie Mellon University and

AAAI/RoboCup Rescue co-Chair: Holly Yanco, Boston College

Hors d'oeuvres Co-Chairs: Francois Michaud, University of Sherbrooke and Dave Gustafson, Kansas State University

AAAI/RoboCup Exhibit Co-Chair: Vandi Verma, Carnegie Mellon University

National Botball 2001 Tournament

No, the graduate students haven't gotten younger! IJCAI-01 and AAAI are pleased to host the National Botball Tournament, featuring top robots built by middle and high school students from across the country. Botball is a game in which robots attempt to achieve a specified goal, in an exciting head to head, double elimination tournament.

The goal of Botball is to get middle and high school students involved in the creative side of technology - to get our upcoming workforce excited about technology, robotics, and AI. Botball involves embodied agent computer programming (in C), mechanical design, science, math, and teamwork.

In this year's tournament, teams either play the black ball or white ball side. The challenge is to score points by moving your colored ping pong balls from inside tubes onto the top of pylons.

We will start out with a seeding round, at which time robots run unopposed - a prime opportunity to show off their best moves. During the regular one-on-one matches, teams are notified three minutes before the round as to which side they will play. Robots are required to start by themselves and shut down after 90 seconds.

Last year's tournament featured a final match between the undefeated homeschool team from Norman, Oklahoma and the seeding round winner from Paxon School for Advanced Studies in Jacksonville, Florida. The stunning finals match had the crowds cheering, and we expect even more excitement this year.

These robots were completely designed, built, and programmed by students from a kit of over 2000 parts. For more information about the Botball program, please see: www.botball.org

Collocated Conferences & Events

IAAI-2001 Conference
August 7 – 9, 2001

IAAI-2001 attendance is free to all IJCAI-01 registrants.

The Thirteenth Annual Conference on Innovative Applications of Artificial Intelligence (IAAI-2001) is the premier venue for learning about AI's successes through deployed real world applications and emerging AI technologies and applications. Featured presentations will include case studies of deployed applications with measurable benefits arising from the use of AI technology, providing clear evidence of the impact and value that AI technology has in today's world. In addition, IAAI-2001 augments these case studies with papers and invited talks that address emerging areas of AI technology and applications.

AI applications developers will learn about tools and techniques enabling the creation of the next generation of AI applications. AI researchers will learn about challenges of real-world domains, the utility of specific AI techniques for applications domains, and the difficulties and successes in deploying AI applications in such domains. IAAI-2001 will address the full range of AI techniques, including knowledge-based and case-based systems, language and speech understanding, planning and scheduling, data mining and machine learning, neural networks, genetic algorithms, information retrieval, and other well-established as well as more recently developed areas within AI. This year, we are pleased to be collocated with the Seventeenth International Joint Conference on Artificial Intelligence, the premier conference devoted to the broad community of people worldwide involved in artificial intelligence. IAAI is organized as an independent program, with coordinated schedules and single registration to allow attendees to move freely between IAAI and IJCAI sessions.

We invite you to contribute to the dialog between basic and applied AI. We look forward to seeing you in Seattle!

See:
www.aaai.org/conferences/IAAI/2001/iaai01.html
for more information.

Haym Hirsh, Rutgers University,
 IAAI-01 Program Chair
Steve Chien, Jet Propulsion Laboratory,
IAAI-01 Cochair

UAI 2001 Conference
August 2 – 5, 2001

A discounted registration fee to UAI 2001 will be offered to all IJCAI-01 registrants.

Uncertainty management is a key enabling technology for the development of intelligent systems. Since 1985, the Conference on Uncertainty in Artificial Intelligence (UAI) has been the primary international forum for exchanging results on the use of principled uncertain-reasoning methods in intelligent systems. The conference has catalyzed advances in fundamental theory, efficient algorithms, and practical applications. Theory and technology first presented at UAI have been proven by their wide application in the scientific, commercial, and industrial communities. The scope of UAI is wide, covering a broad spectrum of approaches to automated reasoning, learning and decision-making, and knowledge acquisition under uncertainty. Contributions range from those that advance theoretical principles to those that provide insights through the empirical study of applications, from quantitative to qualitative approaches, from traditional to non-classical paradigms for uncertain reasoning, and from autonomous systems to those designed to support human decision-making. A primary focus of the conference over the past few years has been Bayesian networks and probabilistic graphical models in general. UAI is the main venue for work on probabilistic models for artificial intelligence. The conference proceedings have become a fundamental reference for researchers and practitioners who want to know about both theoretical advances and the latest applied developments in the field. More information can be found at
http://robotics.Stanford.edu/~uai01/

CONFERENCE ORGANIZATION

Moisés Goldszmidt, General Chair,
Peakstone Corporation

Jack Breese, Program Cochair,
Microsoft Research

Daphne Koller, Program Cochair,
Stanford University

RoboCup-2001

A discounted registration fee to the Robocup-2001 Symposium will be offered to all IJCAI-01 registrants. However, attendance at the Robocup-2001 Competition is free to all IJCAI-01 registrants.

RoboCup is a yearly event featuring an International Symposium, Competitions, and Exhibits that has gathered many researchers interested in multiagent and multirobot systems. In 2001, RoboCup will be held for the first time in the United States, being collocated with IJCAI-01.
See http://www.cs.cmu.edu/~robocup2001

RoboCup-2001 will include:

- An International Research Symposium for the wide research community interested in the concrete challenges of multirobot and multiagent systems and their applications. A discounted registration fee to RoboCup-2001 Symposium will be offered to all IJCAI-01 registrants.

- Several competitions that offer different leagues in two tasks: (i) soccer, as traditionally pursued in RoboCup since 1996, and (ii) search and rescue. This year will include the first RoboCup rescue simulation competition, and, jointly with AAAI, the RoboCup/AAAI rescue robot competition. Attendance at the RoboCup-2001 competition will be free to all IJCAI-01 registrants.

- RoboCup Junior that aims at middle and high school students with competitions of two on two soccer robots, robot dancing, and robot rescue.

- Exhibits, jointly with AAAI, of new robots and tasks, including demonstrations of humanoid robots.

The RoboCup-2001 competitions provide several technical platforms, including soccer and rescue simulations for teams of fully distributed software agents; small robots with offboard vision and computer control allowed; and fully autonomous middle-size robots and Sony legged robots. In addition to advances in perception, reasoning, and multiagent approaches, participants in the robot leagues also contribute new mechanical designs of robots. RoboCup-2001 welcomes attendance and participation by IJCAI-01 research colleagues.

Registration Information

Onsite registration will be located in the Exhibition Hall Lobby on the fourth level of the Washington State Convention & Trade Center, 800 Convention Place, Seattle, Washington. Registration hours will be Friday, August 3 from 1:00 pm – 6:00 pm, Saturday, August 4 – Monday, August 6 from 7:30 am – 6:00 pm, and Tuesday August 7 through Thursday, August 9 from 8:00 am – 6:00 pm, and Friday, August 10, 8:00 am - 12:00 pm. Registration hours are subject to modification. Please refer to the IJCAI-01 web site for further information. All attendees must pick up their registration packets for admittance to programs.

For preregistration, please fill out the form enclosed with this brochure, or register online at www.ijcai-01.org.

IJCAI-01 Technical Program

Your IJCAI-01 program registration includes admission to all technical paper sessions, invited talks and panels, the IJCAI-01 Exhibition, including the RoboCup-2001 Competition, the IJCAI-01 opening ceremony and reception, IAAI-01, the IJCAI-01 conference proceedings, and the IAAI-01 conference proceedings.

In addition, early IJCAI-01 registrants are entitled to a discount at the UAI conference and all IJCAI-01 registrants are entitled to a discount at the RoboCup Symposium. For more information about how to register for UAI, please visit the UAI 2001 web site at http://robotics.stanford.edu/~uai01/. For more information about how to register for RoboCup-2001, please visit http://www.cs.cmu/edu~robocup2001.

Technical Program Fees

Early Regular	$495
Early Student	$125
Late Regular	$610
Late Student	$175
Onsite Regular	$725
Onsite Student	$225

Early registration must be postmarked by June 1, 2001

Late registration must be postmarked by July 2, 2001

Tutorial Program

August 5 – 6

Registrants for the IJCAI-01 technical program are encouraged to participate in the tutorial program at the fees listed below. Prices quoted are per tutorial. Your tutorial program registration includes admittance to one tutorial, the IJCAI-01 Exhibition, and one tutorial syllabus. Prices quoted are per tutorial. A maximum of four may be taken due to parallel schedules.

Normal Tutorial Fees

Early Regular	$90
Early Student	$20
Late Regular	$170
Late Student	$60
Onsite Regular	$220
Onsite Student	$100

It is also possible to attend tutorials without registering for the IJCAI technical program at the following fees:

Tutorial Only Fees

Tutorial Only Regular	$475
Tutorial Only Student	$200

Workshop Program

August 4 – 6

Workshop registration is limited to those active participants determined by the organizer prior to the conference. All IJCAI-01 workshop participants must be registered for the IJCAI-01 technical program. An additional workshop fee is required for each workshop attended.

Your workshop registration includes admittance to one workshop and the working notes for that workshop (if available).

Workshop Fee	$70

IJCAI-01 Banquet

August 8

The fee for the banquet at Tillicum Village is $75. For more information, see page 6.

Accompanying Persons

Accompanying persons are entitled to attend the Official Opening Ceremony, the Opening Reception and visit the IJCAI-01 Exhibition.

Accompanying person Fee	$75

Payment and Registration Information

Prepayment of registration fees is required. Checks, international money orders, bank transfers and traveler's checks must be in US dollars. American Express, VISA, MasterCard, and government purchase orders are also accepted. Registrations postmarked after the July 2 deadline will be subject to onsite registration fees. The deadline for refund requests is July 9, 2001. All refund requests must be in writing. A $75.00 processing fee will be assessed for all refunds granted. All refunds will be made at the conclusion of the conference. Note: In case of conference cancellation for reasons beyond the control of IJCAI-01 organizers, the liability of the IJCAI-01 organization is limited to the fees already paid by the registrants and it especially will not be responsible for any personal inconveniences which may arise.

Student registrations must be accompanied by proof of full-time student status. Registration forms and inquiries should be directed to:

IJCAI-01 REGISTRATION
AAAI
445 Burgess Drive
Menlo Park, CA 94025 USA
Tel: 650-328-3123
Fax: 650-321-4457
Email: ijcai@aaai.org

The registration form and brochure is also available online:
Email: ijcai@aaai.org
Web: http://www.ijcai-01.org

Accommodations

Hotels

IJCAI-01 has reserved a block of rooms in Seattle properties at reduced conference rates. Conference attendees must contact the hotel of their choice directly and identify themselves as IJCAI-01 registrants to qualify for the reduced rates. Please note the cut-off date for reservations and the reservation method and information under each hotel. Rooms will be assigned on a first-come first-served basis. All rooms are subject to state, local, and occupancy taxes (15.6 % at press time).

Headquarters Hotel:

Sheraton Seattle Hotel & Towers
1400 6th Avenue
Seattle, Washington 98101
Reservations: (206) 447-5555
Fax: (206) 447-5525
Single/Double: $173.00
Suites From: $250.00
Additional Person: $20.00
Club Level
Single: $195.00
Double: $220.00
Suites From: $275.00
Additional Person: $25.00
Check-in time: 3:00 pm
Check-out time: 12:00 pm
Cut-off date for reservations: July 6, 2001
Distance to Center: Across the street

All reservation requests must be guaranteed with a credit card. Individuals guaranteeing reservations may cancel up until 6:00 pm on the day of arrival without penalty. In the event an individual cancels their reservation after 6:00 pm, one room night and tax will be charged to the credit card guaranteeing the reservation.

Hilton Seattle

Post Office Box 1927
Sixth and University
Seattle, Washington 98111
Reservations: (206) 624-0500
Fax: (206) 682-9029
Single: $155.00
Double: $175.00
Suite: $355.00 and up
Additional Person: $20.00
Check-in time: 3:00 pm
Check-out time: 1:00 pm
Cut-off date for reservations: July 16, 2001
Distance to Center: 2 blocks

Individuals guaranteeing reservations may cancel 72 hours prior to their arrival date without penalty. In the event an individual cancels their reservation within 72 hours of arrival, one room night and tax will be charged to the credit card guaranteeing the reservation or deducted from the cash deposit guaranteeing the reservation. In the event an individual who has reserved a room checks out prior to the reserved checkout date, the hotel will add an early checkout fee of $75.00 to that guest's individual account. Individuals wishing to avoid an early checkout fee should advise the hotel at or before check-in of any change in planned length of stay. The hotel will inform individuals of this potential charge upon check-in.

The Paramount Hotel

774 Pine Street
Seattle, Washington, 98101
Reservations: (206) 292-9500
Fax: (206) 292-8610
Single: $146.00
Double: $157.00
Triple: $167.00
Quad: $177.00
Check-in time: 3:00 pm
Check-out time: 12:00 pm
Distance to Center: 2 blocks
Cut-off date for reservations: July 2, 2001

Individuals must guarantee rooms by advance deposit or credit card. Should individual cancel room less than 72 hours prior to arrival date, the first night's room and tax will be charged to the individual.

WestCoast Vance Hotel

620 Steward Street
Seattle, Washington 98101
Reservations: (206) 441-4200 or (800) 426-0670
Fax: (206) 441-8612
Single/Double: $115.00
Triple: $125.00
Quad: $135.00
Check-in time: 2:00 pm
Check-out time: 12:00 pm
Distance to Center: 3 blocks

Cut-off date for reservations: July 4, 2001

Individual must guarantee room by credit card. Should individual cancel room less than 24 hours prior to arrival date, the first night's room and tax will be charged to the individual.

Student Housing

IJCAI-01 has reserved a block of dormitory rooms at the University of Washington for student housing during the conference. Accommodations include furnished twin beds, a local-access telephone with voice mail (long-distance calls may be placed using a credit card or prepaid calling cards), and a small fan. Bed linen, towels, soap and drinking cups are provided. Rooms share community bath facilities. Laundry facilities are available in each building. Buses (Nos. 70, 71, 72, 73, 74 and 83) run from University Avenue to the downtown area every five minutes.

Package Rates per person:
Single: $263.23
Double: $193.23
Extra Nights (August 3, 4 and August 10, 2001, no meals included):
Single: $40.00
Double: $26.00

The package rate includes five nights of housing (August 5-9), breakfast and applicable sales tax. Student housing reservations must be received no later than July 13, 2001. A reservation form is enclosed in this brochure. Prepayment of housing fees is required. Advance payment may be made by US dollars by check, purchase order, Visa, MasterCard or American Express. Checks should be made payable to the University of Washington and on a US bank account. Student housing is restricted to full-time graduate or undergraduate students enrolled in an accredited college or university program. Proof of full-time status must accompany the student housing form. Housing forms and inquiries should be directed to:

Conference Housing Reservations
University of Washington
Box 355615
Fax: (206) 543-4094
Phone: (206) 543-7634
Email: confhous@u.washington.edu

Overnight parking is available near the residence halls. The current daily rate is $7.00, Monday through Friday, and $3.00, Saturday, 7:00 am to 12:00 pm. There is no charge to park on campus from 12:00 pm on Saturday to 12:00 am on Sunday or holidays. These rates are subject to change without notice. Availability is limited and not guaranteed.

More information about student housing can be found on the back of the reservation form.

Location & Travel

Airport

Seattle-Tacoma International Airport (SeaTac) is located seventeen miles from downtown Seattle. It takes approximately 25 minutes to get from Seattle-Tacoma Airport to the city center. There are shuttles and taxis from the airport.

Air Transportation and Car Rental

Seattle – Get there for less!

IJCAI has selected Stellar Access, Inc. (SAI) as the official event travel service. Call 1-800-929-4242 and ask for Group #428 to receive the following discounts or the lowest available fares on any other carrier:

American Airlines and United Airlines – save 5% to 10% on lowest applicable fares with an additional 5% off with a 60-day advance purchase. All rules and restrictions apply. Travel between July 29 – August 15, 2001.

Southwest Airlines – save 10% on everyday lowest applicable fares. All rules and restrictions apply. Travel between July 29 – August 15, 2001.

Hertz Rent A Car – rates start as low as $36/day for economy models and $159/week with unlimited free mileage.

Book Online! Pay NO Transaction Fee!

Visit the SAI Website: www.stellaraccess.com – book your reservations from the convenience of your home or office anytime, and be eligible for discounted travel rates. The system is quick and easy. Note: First time users must register and refer to Group #428.

Call SAI at: 800-929-4242 / Outside US and Canada: 619-232-4298 / fax 619-232-6497. A $10 transaction fee will be applied to all tickets purchased via phone service. Reservation hours: M-F 6:30 AM – 5:00 PM Pacific Time.

When calling airlines or Hertz directly, please use the following codes:

American Airlines File # 6871UB	1-800-433-1790
Southwest Airlines File # C8522	1-800-433-5368
United Airlines ID # 549SM	1-800-521-4041
Hertz Rent A Car CV# 02EZ0004	1-800-654-2240

Ground Transportation

The following information provided is the best available at press time. Please confirm fares when making reservations.

Airport Connections

Several companies provide service from Seattle-Tacoma Airport to downtown Seattle. A sampling of companies and their one-way rates are shown below. Contact the company directly for reservations when applicable. The Washington State Convention & Trade Center is located on Interstate 5 and exit 165.

Taxi

Taxis are available at Seattle-Tacoma International Airport. The fare from the airport to downtown Seattle is approximately $30.00.

Shuttle

Gray Line of Seattle
206-624-5077
Seattle-Tacoma Airport to downtown Seattle
Fare: $8.00; $13.00 round trip

Rail

The Amtrack Station is located at Third and Jackson Streets next to the Kingdome, approximately twelve blocks from the Convention & Trade Center. For Amtrak reservations or information, call 1-800-USA RAIL or 510-238-4369

Metro Transit

Metro operates bus service throughout Seattle and King County. Schedules and routes are listed at each bus stop and can also be found at the Visitor Center in the Washington State Convention & Trade Center. Metro Transit is free within the downtown Seattle area. For information call (206) 553-3000

Parking

Parking is available at the Washington State Convention & Trade Center. The rates at press time are $4.00 for the first hour and $1.50 for each additional hour. The cost for 8 hours is $10.00 and 8-12 hours is $11.00.
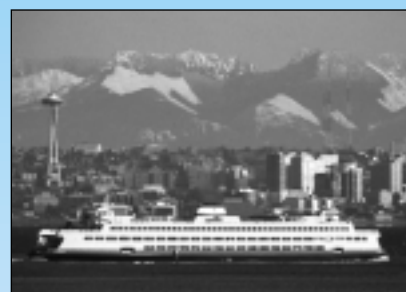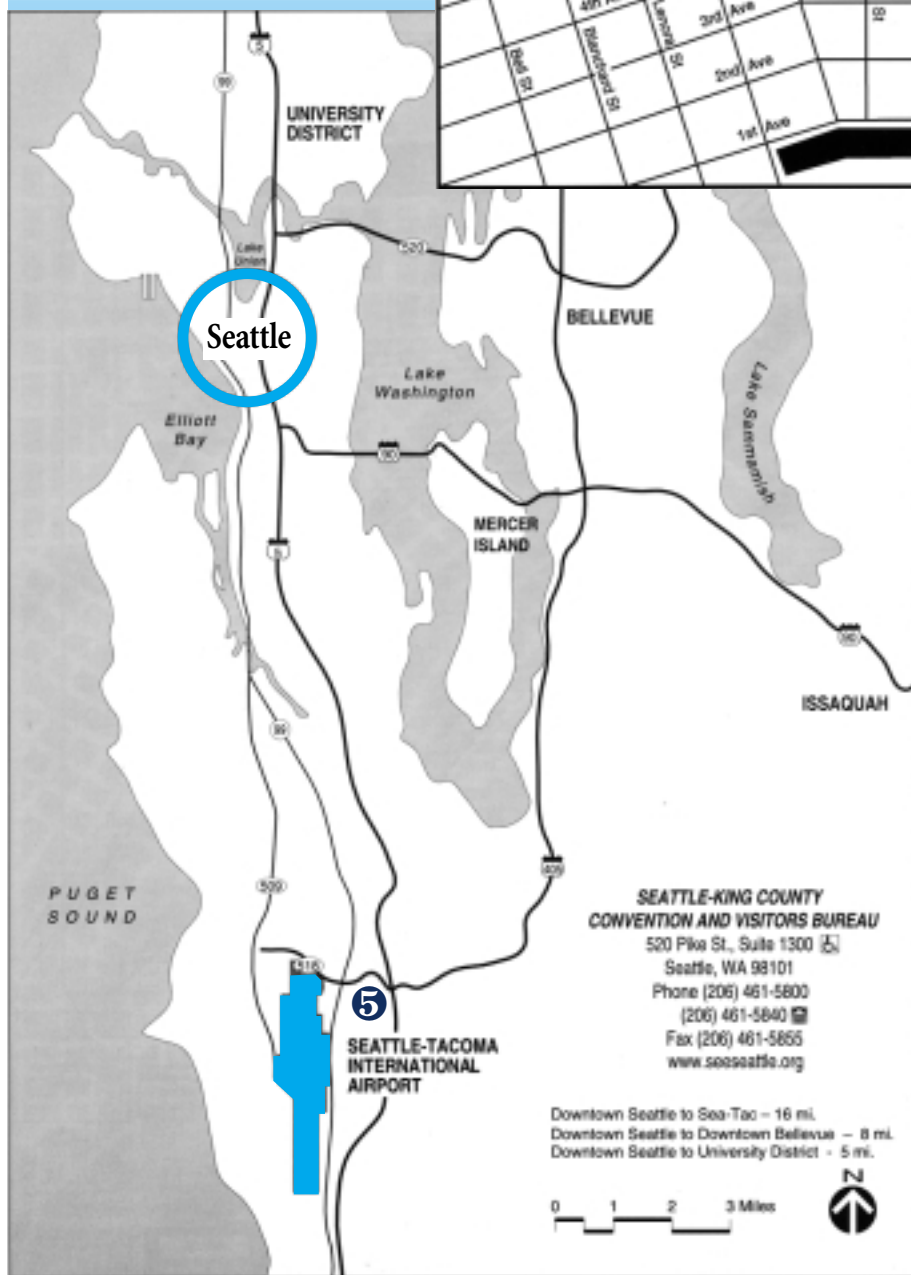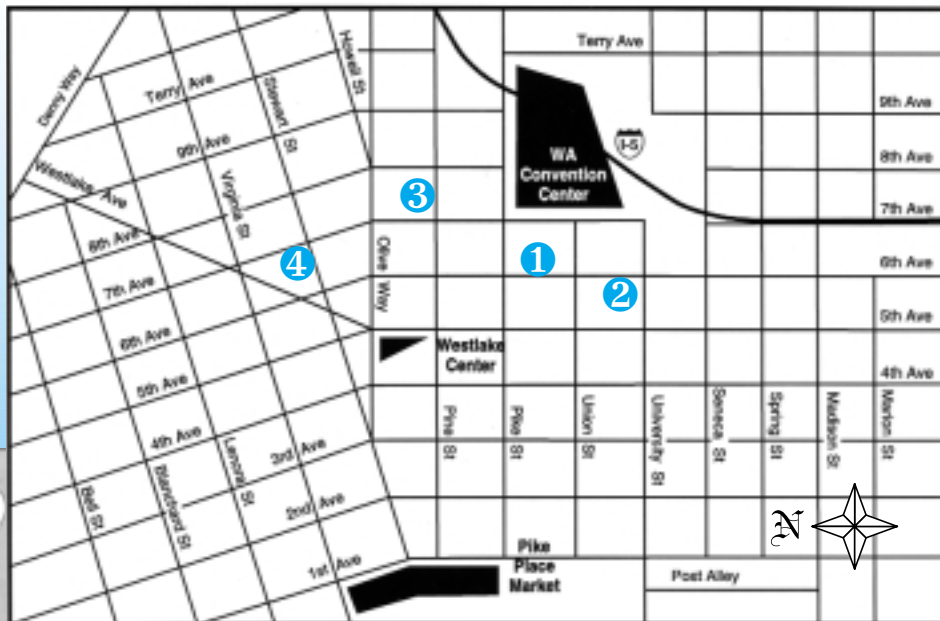
Child Care

Babysitting and childcare services are available from Best Sitters Incorporated. Rates (at press time) are $54.00 for the first four hours (four-hour minimum), and $10 for each additional hour. Parking is $6.00 and any meals must be paid by the individual. Best Sitters Inc. can be reached directly at (425) 455-5533 or through the Sheraton Seattle Concierge at (206) 621-9000. This information is for your convenience, and does not represent an endorsement of Best Sitters Incorporated by IJCAI-01 sponsors.

Seattle Area Maps

Hotels

1 **Sheraton Seattle**
1400 6th Avenue
(On 6th Ave. between Pike and Union)

2 **Hilton Seattle**
Sixth and University
(On 6th Ave. between University and Union)

3 **The Paramount Hotel**
1400 6th Avenue
(On Pine St. between 7th and 8th)

4 **WestCoast Vance Hotel**
1400 6th Avenue
(On Stewart St. between 6th and 7th)

Airport

5 Seattle-Tacoma International Airport (SeaTac) is located seventeen miles from downtown Seattle. It takes approximately 25 minutes to get from Seattle-Tacoma Airport to the city center. There are shuttles and taxis from the airport.

SEATTLE-KING COUNTY
CONVENTION AND VISITORS BUREAU
520 Pike St., Suite 1300
Seattle, WA 98101
Phone (206) 461-5800
(206) 461-5840
Fax (206) 461-5855
www.seeseattle.org

Downtown Seattle to Sea-Tac – 16 mi.
Downtown Seattle to Downtown Bellevue – 8 mi.
Downtown Seattle to University District – 5 mi.

0   1   2   3 Miles

Seattle: The Emerald City

Built on seven hills, with unmatched mountain and water views, the wealth of natural beauty in and around Seattle astonishes first-time visitors. Bounded on the west by Puget Sound, an inland arm of the Pacific Ocean, and on the east by Lake Washington, the city occupies a north-south corridor, slender at the waist, with hundreds of miles of salt and freshwater shoreline literally touch the city's boundaries. The Cascade mountain range is east of the city, and the Olympic Mountains are to the west. Thousands of square miles of evergreen forest extend out from the city, and, on a clear day, the views of mountains and water are spectacular.

Seattle is a major port, transportation hub, and manufacturing center and the principal city of Washington State and of the Pacific Northwest. Some of Seattle's best-known attractions are the Space Needle, Pike Place Market, Pioneer Square, Woodland Park Zoo, Waterfront, Ballard Locks, and the new Experience Music Project. These urban landmarks are clustered in pedestrian-scale sections, best savored on foot. Central business district buses are free, and the Monorail speeds quickly between downtown and the Seattle Center (site of both the Space Needle and the Experience Music Project).

Climate

Seattle has a mild climate all year round. The Olympic Mountains protect the Puget Sound area from heavy rainfall and high winds from the west. On the east, the Cascade Mountains shield the area from winter cold.

Winter days are short, but summer days are long, with 16 hours of daylight in midsummer. The average summer temperature is 73 degrees (22.8 C), and maximum afternoon temperatures of 90 degrees (32.2 C) or more are uncommon. Average yearly rainfall in Seattle is 36.2 inches (92 cm).

Sights and Scenes

Here are some "best bets" for a Seattle Sunday (or any day for that matter). Some are designed for rain, some for shine. Some will take a few minutes, some a whole day. Pike Place Market, Pioneer Square, and the Waterfront are in walking distance from the Washington State Convention and Trade Center and the conference hotels.

Pike Place Market

The in-city farmers' market so captures the essence of Seattle it is on almost everyone's must-visit list. The Market occupies a nine-acre historic district and offers a profusion of vegetables, flowers, fish, baked goods and crafts from more than 100 farmers and 150 craftsmen. There are dozens of cafes. Hours are 10 a.m. – 6 p.m. Monday through Saturday and 11 a.m. – 5 p.m. on Sunday. Many of the restaurants stay open until late in the evening. Pike Place Market is a great place to buy handicrafts, to eat, to people-watch, and to view the harbor.

Pioneer Square

Pioneer Square was settled soon after Seattle was founded in 1851. This is the site of the Skid Road (along Yesler Way) to skid logs downhill to the sawmill and the waterfront. Pioneer Square's handsome brick buildings were built after the Great Fire of 1889. Pioneer Square has scores of interesting shops, antique galleries, and ethnic restaurants and more art galleries per square foot than any other city in the US. The underground tour of the old storefronts beneath the current-day Pioneer Square provides a glimpse of Seattle, circa 1889.

The Waterfront

Seattle's waterfront, once known as "the Gold Rush Strip" stretches from Pier 51 on the south to Pier 70 on the north. It's a popular area for strolling, shopping, dining, and exploring. Pier 70 houses a complex of shops and restaurants in a restored wharf. Waterfront Park is at Pier 57, with its public fishing pier, fish and chip bars, and import houses with merchandise from around the world. Ye Olde Curiosity Shop at Pier 54 specializes in souvenirs and curiosities, including two mummies (Sylvester and Sylvia). You can also take a ferry ride or visit Maritime Park. While visiting the waterfront, ride on the vintage trolley system and get a feeling of some of Seattle's historic past.

The Ballard Locks

One of Seattle's most popular attractions, the Ballard Locks have served since 1917 as a watery elevator to lift vessels from the saltwater of Puget Sound to freshwater lakes, and vice-versa. First-timers are often mesmerized by the sight of a lock full of vessels being raised or lowered from 6 to 26 feet (depending on the tide). The locks, the fish ladder, and the Carl English Gardens are open daily from 7:00 a.m. to 9:00 p.m. The visitor center is open from 9:00 a.m. to 6:00 p.m.

Seattle Center

Seventy-four acres of arts, entertainment, recreation, shopping, dining, and educational and cultural adventures awaits you at the Seattle Center. Home of the 1962 World's Fair, Seattle Center hosts the Space Needle, the Pacific Science Center, the Experience Music Project, Fun Forest Amusement Park, Seattle Children's Museum, and the historic Seattle Center Monorail, which now connects to the Westlake Center.

The Space Needle

Seattle's landmark, which opened in 1962, provides visitors with a matchless view of the city and Puget Sound. On a clear day, visitors also spot Mount Rainier, Mount Baker, and the Cascade and Olympic ranges from the top-level observation deck. Hours for the observation deck are Sunday – Thursday: 9:00 a.m. - 11:00 p.m., Friday and Saturday: 9:00 a.m. - 12:00 midnight. The SkyCity restaurant is one level below the observation deck. As you dine, the outer seating area revolves ever so slowly, making a complete revolution each hour.

General Information

Experience Music Project

The Experience Music Project is the new interactive music museum located at the Seattle Center. Designed by Frank Gehry, The Experience Music Project is Seattle's most unusual building—both in shape (a "blob"?) and in color (red, blue, gold, silver, and purple). Inside you will find kiosks offering interactive tours of rock history, a treasure trove of musical memorabilia (including Bob Dylan's 1949 Martin guitar, Jimi Hendrix's Woodstock guitar, Eric Clapton's Fender Stratocruiser, and Janis Joplin's "groovy pants"), and much, much more. Hours are 9:00 a.m. to 11:00 p.m. daily.

Woodland Park Zoo

The Woodland Park Zoo, one of the nation's ten best, is known for its natural habitats, especially a large, lush gorilla exhibit and tropical forest for elephants. The five-acre African savanna is home to hippos, lions, zebras, springboks, and giraffes. Don't miss the walk through the swamp or the trip through the Nocturnal House, home of the shy, seldom seen creatures of the night. The zoo is open daily from 9:30 a.m. to 6:00 p.m.

General Information

Language

English

Currency

The American Dollar, with one dollar equaling 100 cents. Approximate rates of exchange in mid-January 2001 were:

US$1.00 = .67 British Pounds

US$1.00 = 1.50 Canadian Dollars

US$1.00 = 6.9 French Francs

US$1.00 = 2.06 German Marks

US$1.00 = 115.69 Japanese Yen

US$1.00 = 1.05 Euros

All major credit cards are accepted in all hotels, most restaurants and department stores.

Banking

Banks in downtown Seattle are usually open Monday–Friday from 9:00 am–5:00 pm. Some banks are open Saturdays from 9:00 am-4:00 pm. Automatic teller machines are available throughout town.

Taxes

The current sales tax in Seattle, Washington is 8.6%.

Tipping

In general, a tip of 15 percent is given to waiters, waitresses, hairdressers, taxi drivers, etc. Bellhops, doormen, porters, etc., at hotels, airports and railway stations are generally paid $1.00 per item of luggage.

Visitor Information

Visitor information is available in the Washington State Convention & Trade Center. This one-stop center provides visitors with tourist information and services such as travel planning, information on activities, and attractions.

Visitor Information
800 Convention Place
Washington State Convention & Trade Center
Center-Lobby Level
(206) 461-5840

Restaurants

Catagory	Breakfast	Lunch	Dinner
Fast Food	$3-4	$5-7	$8-10
Economy	$5	$8-12	$10-20
Deluxe	$15-25	$15-35	$25-50

(hotels only for breakfast)

Excursions

IJCAI-01 has arranged with Seattle V.I.P. Services to offer IJCAI-01 attendees a special tour program that includes some of the highlights of Seattle and its surrounding areas. Please see the IJCAI-01 web site for more information on making arrangements for these exciting tours:

♦ **Independent Victoria Day Trip, Friday, August 3**

♦ **Seattle City Highlights Tour by Night with Dinner in the International District, Tuesday, August 7**

♦ **Mt. Rainier Tour, Saturday, August 11**

IJCAI - 03 Conference Dates
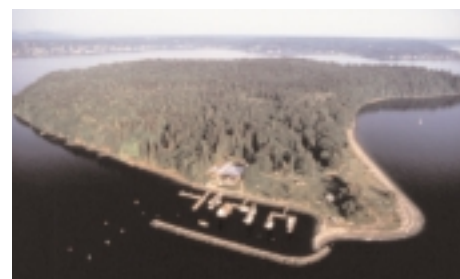
IJCAI-03
Acapulco, Mexico
August 9 – 15, 2003

IJCAI-03, the Eighteenth International Joint Conference on Artificial Intelligence, will be held August 9-15, 2003 in Acapulco, Mexico. It is sponsored by the International Joint Conferences on Artificial Intelligence, Inc. (IJCAII), and cosponsored by the Mexican Society for Artificial Intelligence, and the American Association for Artificial Intelligence. Anthony Cohn of the University of Leeds will be the IJCAI-03 Conference Chair, Georg Gottlob of Vienna University of Technology will be the IJCAI-03 Program Chair, and Francisco Cantu of the Monterrey Institute of Technology will be the Local Arrangements Chair.

For further information, contact one of the following:

Anthony G. Cohn
Conference Chair, IJCAI-03
University of Leeds
School of Computation Studies
Leeds LS2-9JT
United Kingdom
44 113 235 482
agc@scs.leeds.ac.uk

Georg Gottlob
Program Chair, IJCAI-03
Vienna University of Technology
Institute of Information Systems
Favoritenstrasse 9
A-1040 Wien
Austria
+43-1-58801-18420
gottlob@dbai.tuwien.ac.at

Francisco J. Cantu
Local Arrangements Chair, IJCAI-03
Monterrey Institute of Technology
Center for Artificial Intelligence
E. Garza Sada 2501 Sur, C.P. 64849
Monterrey, N. L.
Mexico
+52-8-328-4182 office
+52-8-328-4189 fax
fcantu@campus.mty.itesm.mx

Ronald J. Brachman
IJCAI Secretary-Treasurer
AT&T Shannon Laboratory
180 Park Avenue, Room A221
Florham Park, NJ 07932-0971 USA
E-mail: rjb@research.att.com

IJCAI - 01 Conference Committee

IJCAI-01 Conference Committee Contact Information

CONFERENCE CHAIR:
Hector Levesque
University of Toronto, Canada
E-mail: hector@cs.toronto.edu

PROGRAM CHAIR:
Bernhard Nebel
Albert-Ludwigs-Universität, Germany
E-mail: nebel@informatik.uni-freiburg.de

IJCAI SECRETARY-TREASURER:
Ron Brachman
AT&T Labs – Research, USA
E-mail: rjb@research.att.com

LOCAL ARRANGEMENTS CHAIR:
James Hoard
Boeing, USA
E-mail: james.e.hoard@boeing.com

GENERAL INFORMATION:
American Association for Artificial Intelligence
445 Burgess Drive
Menlo Park, California 94025-3442 USA
Phone: 650-328-3123

Fax: 650-321-4457
E-mail: ijcai@aaai.org
URL: www.ijcai-01.org

IJCAI-01 Preregistration Application

Name _____ Company/Univ. _____

☐ Home   ☐ Work

Address _____ Dept./MS _____

City _____ State _____ Zip _____

Country _____ Daytime Phone & Fax _____

E-mail Address _____

Circle all courses and fees that apply.	Early Registration Rates _Postmarked by June 1_		Late Registration Rates _Postmarked by July 2_		TOTAL
	Regular	Student	Regular	Student	
IJCAI -01 Technical Program Including IAAI-01	$495	$125	$610	$175	_____

Tutorial Program
(See brochure for descriptions)

	Regular		Student		Regular		Student		
	with tech	_without tech_	_with tech_	_without tech_	_with tech_	_without tech_	_with tech_	_without tech_	
8/5 AM SA1 SA2 SA3 SA4 SA5	$90	$475	$20	$200	$170	$475	$60	200	
8/5 PM SP1 SP2 SP3 SP4 SP5	$90	$475	$20	$200	$170	$475	$60	200	
8/6 AM MA1 MA2 MA3 MA4 MA5	$90	$475	$20	$200	$170	$475	$60	200	
8/6 PM MP1 MP2 MP3 MP4 MP5	$90	$475	$20	$200	$170	$475	$60	200	_____

Workshop Program	$70 each. By invitation only. _Please list workshop code(s)_ _____	_____
Seattle Area Tours	Check box if you would like information about tours	☐
Banquet (Tillicum Village)	$75 per person	_____
Accompanying Persons _(Spouse, child, or guest)_ _Includes Opening Reception and Exhibition_	$75 per person Number of Persons: _____	_____

Method of Payment _(Circle One):_

MC   Visa   Amex   Check (payable to IJCAI -01 and drawn on a US Bank)   US Govt. PO

Card Number _____ Exp. Date _____

Name (as it appears on card) _____ Signature _____

ALL REFUND REQUESTS MUST BE MADE IN WRITING. The refund request deadline is July 9, 2001. A $75 processing fee will be assessed for all refunds granted.

Registrations received after July 2 are subject to on-site rates . On-site registration will be in Exhibition Hall Lobby,

fourth level, Washington State Convention Center, 800 Convention Place, Seattle, Washington USA

Send with payment to IJCAI -01, American Association for Artificial Intelligence, 445 Burgess Drive, Menlo Park, CA 94025-3442

650 / 328-3123;   Fax 650 / 321-4457

Total Enclosed

_____

IJCAI - 01
Pregistration Application

Early registration must be postmarked by June 1, 2001

Late registration must be postmarked by July 2, 2001

UW CONFERENCE SERVICES HOUSING RESERVATION

International Joint Conference on Artificial Intelligence
August 5 – August 10, 2001

Package Description A special package has been created to provide campus housing and food services for delegates participating in International Joint Conference on Artificial Intelligence. The package includes:

5 nights of housing nights of August 5 – 9, 2001	-nonrefundable reservation fee $10.86
5 breakfasts August 6-10, 2001	-applicable sales tax

If you wish to arrange for this package, please complete and return this form along with full payment no later than Tuesday, July 10, 2001. Upon receipt of your reservation and prepayment we will send you a confirmation including a campus map and travel directions.

Reservation Information Please use a separate form for each person's reservation.
Please type or print clearly.

☐ FEMALE ☐ MALE

NAME (LAST, FIRST, MIDDLE INITIAL)

MAILING ADDRESS

CITY/STATE/ZIP/COUNTRY

TELEPHONE   FAX   EMAIL

Roommate Request If you select a double room, you may indicate a roommate preference and mutual requests will be honored. If you select a double room and do not designate a roommate, one will be assigned.

Accessibility Please describe any accessibility accommodation you may require for housing or parking:

Standard Package Package dates are August 5-10, 2001, and may not be altered. There is no credit for fewer days or missed meals. Package rates are per person. Choose one:

DOUBLE OCCUPANCY: $193.23   = $ _____

SINGLE OCCUPANCY: $263.23   = $ _____

Extra Nights July 31, August 1, 2, 3, 4 and August 10, 2001, **ONLY**. Breakfast is included. Rates listed are per person per night. Choose one:

DOUBLE OCCUPANCY: $36.48 X _____ # OF NIGHTS   = $ _____

SINGLE OCCUPANCY: $50.48 X _____ # OF NIGHTS   = $ _____

TOTAL ENCLOSED: = $ _____

Method of Payment (check one)

☐ Check (US funds on a US bank account) payable to University of Washington. Please mail reservation with check in same envelope!
☐ Purchase Order. Please attach copy of purchase order and advise us of any action required to initiate payment.

☐ Visa
☐ MasterCard
☐ AMEX

ACCOUNT NUMBER _____   EXPIRATION DATE _____

AUTHORIZED SIGNATURE _____

Room Qualifications
Please indicate room type preference:

☐ SINGLE   ☐ DOUBLE

ARRIVAL DATE: _____

DEPARTURE DATE: _____

Conference Office Use Only	
Conf #210834 _____	
Coord CCS _____	
Conf AR # 25159 AAA _____	
Log Date _____	
Log Initial _____	
Log # _____	
Batch Date _____	
Batch Initial _____	
Del AR # _____	
Total Recd $ _____	
Total Due $ _____	
We Owe $ _____	
Ref Sent _____	
Del Owes $ _____	
Confirm Initial _____	
Confirm Date _____	

You may fax this form if paying by credit card, but then please DO NOT mail an additional copy!

Additional information on reverse side

UW Conference Services Housing Policy Guidelines

Package Plan Housing and meal service are offered as a package plan for fixed dates. No credit is given for a shorter stay or missed meals. When available, early arrival and late departure days may be added to the package at an additional charge. Please observe the allowable extra dates on the front of this form.

Accommodations Residence halls are within a 10 to 15 minute walk of most meeting areas on campus. Residence halls are not air-conditioned. All rooms are furnished with twin beds, a local-access telephone with voice mail (long-distance calls may be placed using a credit card or prepaid calling cards) and a small fan. Bed linen, towels, soap and drinking cups are provided. Rooms share community bath facilities. Occasionally the appropriate bath facility will be located one floor above or below your room. Attractive lounges, patios and other gathering areas are found throughout the halls. Laundry facilities are available in each building. Television lounges and kitchenettes with ranges or microwave ovens are located on most floors. Residence halls offer a smoke-free environment. Smoking is prohibited in all public areas and in private sleeping rooms. Please note that UW residence halls are designed for adult usage, and the facilities are not childproof. Adults are responsible for the supervision of their children at all times. The University of Washington is a pedestrian campus, bring comfortable shoes and be prepared to walk.

Meal Service Meals included in the package plan are served in a dining room reserved for conference guests. Whatever your prearranged board plan may be, you will find a selection of carefully prepared items offered cafeteria (or buffet) style. All meals offer a meatless selection but vegan meals are not available. Other dietary restrictions and preferences may not be accommodated.

Parking Overnight parking is available near the residence halls. The current daily rate is $7.00 Monday through Friday and $3.00 Saturday, 7 a.m. to 12 noon. There is no charge to park on campus from 12 noon on Saturday to midnight on Sundays or holidays. These rates are subject to change without notice. Availability is limited and not guaranteed. More information regarding parking will be sent with your confirmation.

Payment Reservations will not be confirmed unless full payment is sent with this reservation form by the reservation deadline date on the front of this form. Advance payment may be made in US dollars by check, purchase order, Visa, MasterCard or American Express. Checks should be made payable to the University of Washington and on a US bank account. Purchase orders should include instructions for initiation of payment. Arrangements must be made in advance if purchase orders are to be presented on arrival. Checks and purchase orders must be mailed with the reservation form in the same envelope. The University of Washington charges $25 for all returned checks. Reservations paid by Visa, MasterCard or American Express may be faxed. To avoid duplicate reservations and charges, please do not mail in the faxed form.

Confirmation Once this reservation form is received with payment, you will be sent a confirmation identifying your check-in location, along with travel directions to campus. Check-in time is 2 p.m. and checkout time is 11 a.m. unless the confirmation states otherwise.

Cancellations and Refunds

- If the cancellation is received by the Conference Services office before the reservation deadline date, the prepayment less the reservation fee of $10.86, will be refunded.
- If the cancellation is received by the Conference Services office after the reservation deadline but before the scheduled arrival date, the prepayment of $10.86 and $38.65 double/$52.65 single will be retained and the balance will be refunded.
- If no advance cancellation is received by the Conference Services office and you are a no-show, the prepayment less the reservation fee of $10.86 and $96.62 double/$131.62 single will be retained and the balance will be refunded.

If paying by check or PO,
✉ **mail form and payment to:**
CONFERENCE HOUSING RESERVATIONS
University of Washington
Box 355615
Seattle, WA 98195

If paying by credit card, 📠
fax to:
CONFERENCE HOUSING RESERVATIONS
Fax: (206) 543-4094

Questions? Please contact us at:
CONFERENCE SERVICES
☎ Tel: (206) 543-7634
🖳 Email: confhous@u.washington.edu

IJCAI•01

**Remember to check
www.ijcai-01.org
for late-breaking news**

IJCAI◆01

Contents:

For Further Information:

American Association for Artificial Intelligence

**445 Burgess Drive
Menlo Park, CA 94025, USA**

650-328-3123
650-321-4457 (fax)
Email: **ijcai@aaai.org**