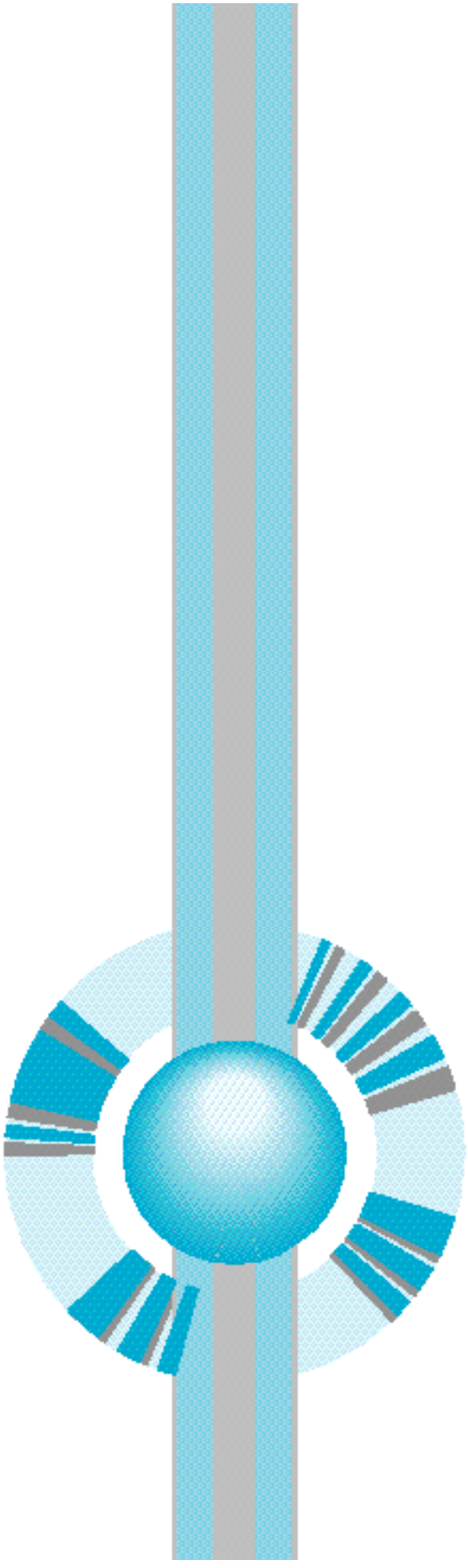
AAAI-91 Registration Brochure

National Conference on Artificial Intelligence
July 14–19, 1991



Anaheim Convention Center
Anaheim, California

2 Introduction

Introduction

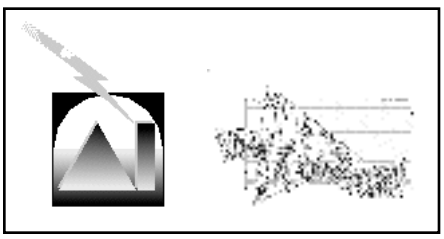
With the advent of the Ninth National Conference on Artificial Intelligence, it is exciting to review the evolution that the conference has gone through over the past several years. As the primary national conference on artificial intelligence, scientific research remains the primary focus of the conference.

However, as the field of artificial intelligence matures, so should the conference. We are experimenting both with the form and the content to meet the changing needs.

We attempt to serve the scientific community by presenting a program which is both technical and practical in nature. AI-On-Line was introduced in 1990 to explore the current practice and the intellectual issues it raises. It will continue in 1991. We are also pleased to announce the collocation of the Third Annual Conference on Innovative Applications in Anaheim. Holding these two prestigious events in the same location will afford attendees the opportunity of visiting both. Scientific participants can see how theory is employed within the real world, and practitioners will view current successes and innovations in AI science.

Artificial Intelligence continues to be both a fascinating and evolving field. We expect that AAAI-91 will reflect the energy and accomplishments during the past year.

Daniel G. Bobrow
President, AAAI



Cochair's Statement

The themes of this year's conference are interaction and growth. Through a new conference format we hope to encourage greater interaction among individual researchers and facilitate communication between diverse groups of researchers. It is designed to provide a more intimate atmosphere for researchers with similar interests. Through a modified review process we hope to identify and foster promising new research in its early stages. Its purpose is to encourage presentation and exploration of growth in the field.

This year the conference will be organized around several specialized forums each emphasizing a different set of coordinated topics. Each of these specialized forums will feature a schedule of presentations, meet-the-author sessions, panels, and invited speakers united by a set of related research issues. Scheduling will be arranged to encourage staying in one place for extended periods, and seating will facilitate note taking and audience participation. There will be time to interact more closely with the authors in a poster session following each set of presentations. Conference participants may freely move between forums and are encouraged to participate in as many different forums as they have the time and inclination. The forum presentations will be synchronized to simplify moving about.

The program committee has been encouraged to seek out and nurture innovative, ground-breaking research. We want to change the view that the purpose of the NCAI proceedings is archival and that the program committee only accepts papers describing results in well-established programs of research. We are also looking for papers with a more balanced blend of theory and practice. The program committee was selected with both these thoughts in mind. The conference format is designed to facilitate the exploration of new directions for research and to allow for interaction between the theoretically and the empirically oriented.

The new conference format is part of an *experiment* being conducted to explore ways of improving the national conference. We hope that you will take advantage of the opportunities afforded by the new format to take an active part in this year's national conference and that the result will be a more exciting and productive conference for all.

–Tom Dean and Kathleen McKeown
Cochairs, Program Committee

Opening Address

Tuesday Morning, July 16, 1991

"Themes and Directions of Artificial Intelligence: Opportunities and Challenges" by Saul Amarel, D.Eng.Sc.

Saul Amarel, the Alan M. Turing Professor of Computer Science at Rutgers University, has been active in AI research since the early 1960s. Amarel's recent research interests include problems in basic AI-representations in problem solving, theory formation processes, learning and expertise acquisition, design and planning problems— and applications of computer science to the study and automation of design and manufacturing processes.

The former Director of the Information Science and Technology Office (ISTO) at DARPA, (while on leave from Rutgers), Amarel was responsible for a broad national program of research in computer science and engineering, ranging from VLSI technology, computer architectures and networking, to software systems and AI.

At Rutgers, Amarel organized the Lab for Computer Science Research. He also founded the Rutgers Research Resource on Computers in Biomedicine, which has been a major center for research on knowledge-based systems since 1971.

From 1957 to 1969 Amarel was head of computer theory research at RCA Labs, and from 1969 to 1984 he was chairman of the Department of Computer Science at Rutgers. He received his M.S. (1953) and D.Eng.Sc. (1955) from Columbia University.

Technical Program

July 16–19, 1991

Includes three and one-half days of technical paper presentations by the top scientists in artificial intelligence followed by poster and summary sessions. Content areas include automated reasoning; cognitive modeling; distributed problem solving; education; enabling technology and systems; general knowledge representation; knowledge-based systems; machine learning; mathematical foundations; natural language; perception and signal understanding; planning, scheduling, and reasoning about action; reasoning about physical systems; robotics and control; and user interfaces. Keynote speakers, invited talks, panel discussions, a video program featuring research from AI laboratories throughout the world, an opening reception, and a tour program of local AI laboratories and research facilities will round out the technical program.

Tutorial Program

July 14–15, 1991

Twenty morning or afternoon sessions which explore evolving techniques taught by experienced scientists and practitioners in artificial intelligence. The tutorials are divided into the following three groups:

Emerging Technologies (ET)—relatively more theoretical tutorials that focus on a specific new technology.

Industrial Applications (IA)—tutorials that focus on a specific application area.

Practical Issues (PI)—tutorials that focus on systems building and management issues in building and deploying AI systems.

Descriptions begin on page 5.

AI-On-Line

July 16-18, 1991

A highly popular series of interactive forums introduced at AAAI–90 in Boston. Short presentations by users of specific, successful deployed AI applications followed by intensive, interactive discussions.

Topics from AAAI–90 in Boston included "Six Companies Reveal Results of Expert Systems Successes," "Why and How Corporate America Is Integrating AI into Data Processing," "What Users Are Buying Today in AI and Why: Reports from Management," "Developing Real-Time On-Line Applications," "Differentiating Expert Systems Products," and "AI Versus Conventional Data Processing." Representatives from leading American and international companies and institutions, including Aetna Life and Casualty, AI Corp., Aion Corporation, Alcatel ISR France, American Airlines, American President Companies, Andersen Consulting, Burlington Northern Railroad Information Systems, Chemical Bank, CIGNA, Coopers & Lybrand, Digital Equipment Corporation, Dun & Bradstreet, Eastman Kodak, E.I. DuPont de Nemours and Company, Ford Motor Company, Frito-Lay, Exxon Company USA, Gensym Corporation, Inference Corporation, Lockheed Missiles and Space Company, Lund Institute of Technology, Massachusetts Institute of Technology, MCI, Mutual of New York, Neuron Data, Owens Corning, NASA-Johnson Space Center, Nynex, Renaissance International, Rockwell International, Sears Merchandising Group, Sun America Financial, Texaco Inc., and US West, participated.

AAAI–91 / IAAI–91 Joint Exhibition

July16-18, 1991

Approximately 100 exhibits and demonstrations by the leading suppliers of AI hardware and software, as well as consulting organizations and publishers displaying their new products or services. At time of publication, 1991 exhibitors include Ablex Publishing Corporation, Abtech Corporation, Academic Press, Addison Wesley Publishing Co., AICorp, AION Corporation, Andersen Consulting, Automated Technology Systems Corporation, Bell Atlantic Software Systems, BIM SA/NV, Blackboard Technology Group, Cambridge University Press, Carnegie Group Inc., Chestnut Software, Cognitive Systems, Digital Equipment Corporation, Elsevier Science Publishers, Envos/Venue, Expertelligence Inc., EXSYS, Inc., Franz Inc., Gensym Corporation, Harlequin Ltd., HNC, IBM, IEEE Computer Society, Inference Corporation, Information Builders, John Wiley & Sons, Kluwer Academic Publishers, Lawrence Erlbaum & Associates, Lucid Inc., The MIT Press, Morgan Kaufmann Publishers Inc., Neural Ware, Inc., Neuron Data Inc., Oxford University Press, Paperback Software Intl., Paralogic, *PCAI*, Production Systems Technologies, Inc., Quintus Computer Systems Inc., Rosh Intelligent Systems, Schwartz Associates, Springer-Verlag New York Inc., Sun Microsystems Inc., Symbolics Inc., U.S. Air Force, and Wisdom Systems.

PRELIMINARY PROGRAMS OF AAAI-91 and IAAI-91 WILL BE AVAILABLE IN MID-MARCH. INDIVIDUALS WHO ARE PREREGISTERED AND AAAI MEMBERS WILL RECEIVE THEM AUTOMATICALLY.

IAAI-91

July 15-17, 1991

Collocated with the National Conference for the first time is the Third Annual Conference on Innovative Applications of Artificial Intelligence. IAAI–91 highlights approximately twenty deployed AI applications judged to be the most innovative. A series of plenary and panel sessions are accompanied by audiovisual presentations, including live computer projection. Areas of interest in 1991 include expert systems applications as well as systems employing natural language, computational vision, speech, robotics, and other AI technologies. *See page 11 for special combined registration.*

Workshop Program

July 14-18, 1991

Twenty-one one-day workshops provide a smaller, more informal forum for the discussion of research and applications issues with selected focus. Attendance at the workshops is limited to active participants and is determined by individual organizers prior to the conference.

Registration

Technical Program Registration

July 16–19, 1991

Includes admission to the technical program, AI-On-Line, the AAAI-91/IAAI-91 Joint Exhibition, and the AAAI-91 Conference *Proceedings.*

Registration Fee Schedule

Early Registration (Postmarked by 17 May)

AAAI Members

Regular $235 Student $95

Nonmembers

Regular $280 Student $155

Late Registration (Postmarked by 14 June)

AAAI Members

Regular $285 Student $95

Nonmembers

Regular $330 Student $155

On-Site Registration (Hours below)

AAAI Members

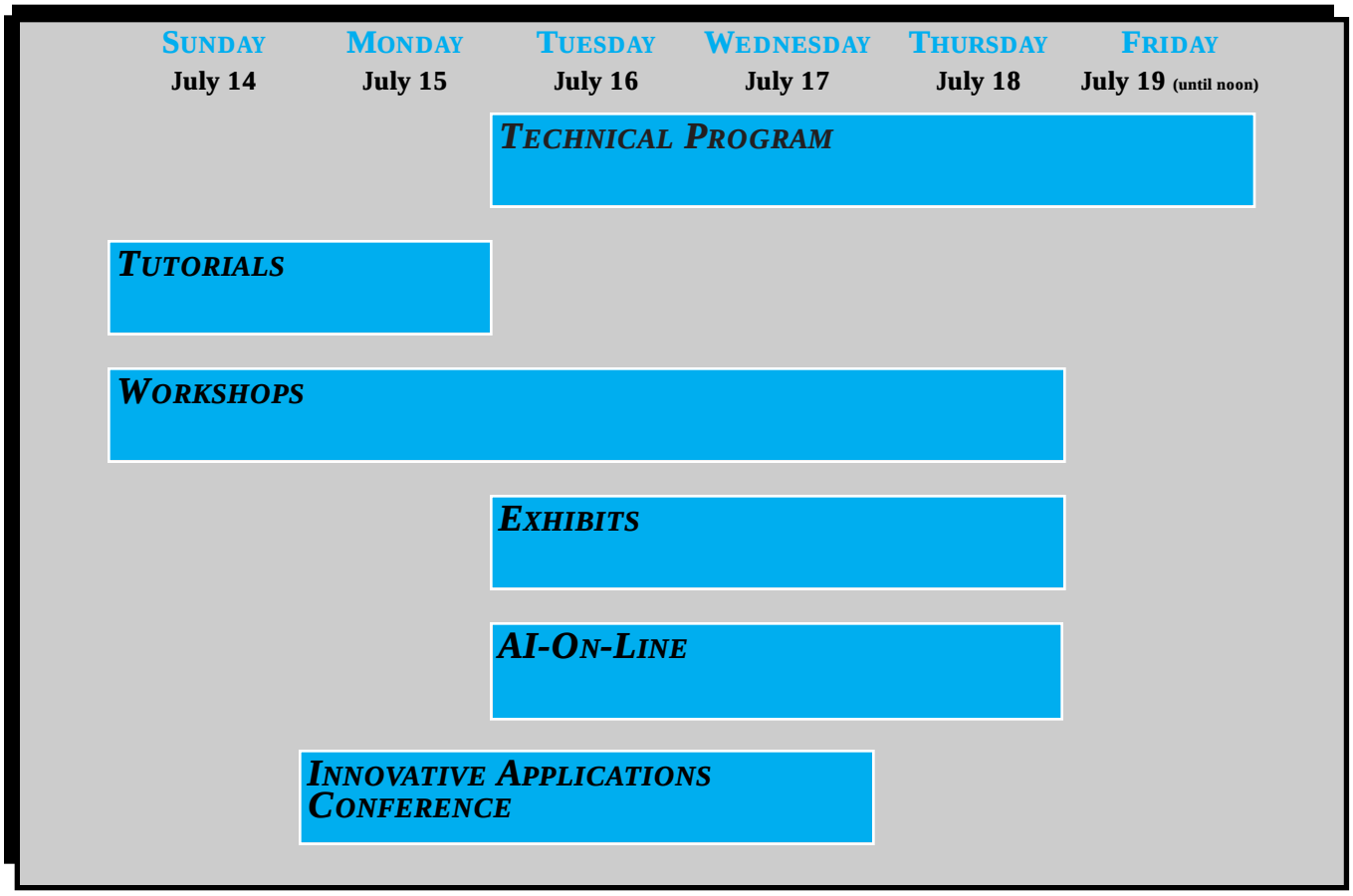
Regular $350 Student $100

Nonmembers

Regular $390 Student $170

4 Registration

AAAI–91 & IAAI–91 Conferences At A Glance



Tutorial Program Registration

July 14–15, 1991

Includes admission to tutorial, AI-On-Line, the AAAI-91/IAAI-91 Exhibition, and the tutorial syllabus. Prices quoted are per tutorial. A maximum of four may be taken due to parallel schedules.

Tutorial Fee Schedule

Early Registration (Postmarked by 17 May)
AAAI Members
Regular $190 Student $65
Nonmembers
Regular $235 Student $85

Late Registration (Postmarked by 14 June)
AAAI Members
Regular $230 Student $90
Nonmembers
Regular $270 Student $110

On-Site Registration (Hours below)
AAAI Members
Regular $290 Student $120
Nonmembers
Regular $330 Student $140

IAAI-91 Registration

July 15–17, 1991

A reduced registration fee of $95.00 for IAAI-91 is offered to AAAI-91 technical program registrants (including students). Please see registration form. For further information, please contact IAAI-91, 445 Burgess Drive, Menlo Park, California 94025; 415/328-3123; fax 415/321-4457; or by email at iaai@aaai.org.

Workshop Registration

July 14–18, 1991
Limited to active participants determined by the organizer prior to the conference. Those individuals attending workshops only are subject to a $40.00 registration fee.

Payment & Registration Information

Prepayment of registration fees is required. Checks, international money orders, bank transfers and traveler's checks must be in US$. AMEX, Visa, MasterCard, and government purchase orders are also accepted. Registrations postmarked after the June 14 deadline will be subject to on-site registration fees. The deadline for refund requests, which must be in writing, is June 21, 1991. A $75.00 processing fee will be assessed for all refunds. Student registrations must be accompanied by proof of full-time student status.

Registration forms and inquiries should be directed to AAAI-91, 445 Burgess Drive, Menlo Park, California 94025-3496, USA; 415/328-3123; Fax 415/321-4457; Email ncai@aaai.org.

Onsite Registration will be located in the California Room of the Anaheim Convention Center, 800 West Katella Avenue, Anaheim, California.

Registration hours will be Sunday, July 14–Thursday, July 18; 7:30 AM–6:00 PM. All attendees must pick up their registration packets for admittance to programs.

Tutorial Program

The tutorials are divided into
- Emerging Technologies (ET)),
- Industrial Applications (IA), and
- Practical Issues (PI).

Sunday, July 14, 9:00 AM–1:00 PM

SA1

AI in Business, Finance, and Accounting (IA)

This tutorial focuses on the unique aspects of finance, accounting and other business domains and the challenges/opportunities for AI. Various issues will be discussed including knowledge representation for financial and business applications, integration of financial and business AI with conventional information systems, knowledge maintenance and controls, integration of various AI technologies (including neural nets, expert systems, case-based reasoning, and natural language) in business domains. Various real-world applications from finance and accounting will be discussed in depth. A discussion of AI project selection, planning, development, implementation and maintenance issues is also planned.

Prerequisite Knowledge: Familiarity with knowledge based systems is assumed but knowledge of particular programming paradigms is not required. A general understanding of existing business information technology will be helpful.

Speakers: Paul R. Watkins, Advanced Technologies in Information Systems, University of Southern California, and David Shpilberg, Information Technology, Goldman Sachs & Co., New York.

SA2

Artificial Intelligence and Engineering Design (IA)

This tutorial will present examples of existing AI-based aids for design, and explore current research in this area. Students should expect to acquire a basic familiarity with the organization, representation of knowledge, and search control employed in a number of AI-based design aides. Topics to be covered include: the nature of design and design knowledge; alternate models of design; representation of design artifacts; qualitative reasoning in design; cooperative product development; domain independent frameworks for implementing knowledge-based design systems; and case studies in various fields of engineering.

Prerequisite Knowledge: Introductory background to AI would be helpful, but not necessary.

*Speakers:*D. Sriram, Intelligent Engineering Systems Laboratory, MIT, and Chris Tong, Department of Computer Science, Rutgers University.

SA3

Embedding Inference: Architectures for AI Applications (PI)

This tutorial addresses the software engineering issues in embedding inference and dynamic representations within conventional systems. We describe a range of system architectures that embed AI capability, together with examples of fielded systems. We discuss specific approaches for integrating AI capabilities with multiprocess environments, databases, user interfaces, and networked heterogeneous environments. We detail a "lightweight" symbolic processing approach for embedding a customized inferencing capability within an application, with low overhead. Finally, we survey relevant trends in AI engineering, including standards, application-specific tools, and AI language support for integration.

Prerequisite Knowledge: This tutorial is intended for developers of fieldable AI systems. Familiarity with expert systems is assumed.

Speakers: Simran S. Khalsa, Sun Microsystems, and Earl D. Sacerdoti, The Copernican Group.

SA4

Knowledge Acquisition Techniques (PI)

This tutorial will discuss how to acquire, analyze, and organize knowledge in order to build expert systems. The tutorial will focus on the relationship between knowledge acquisition and the application development process. The most common knowledge-acquisition activities will be discussed, along with how those activities change as the project progresses. Audience members will leave the tutorial with an understanding of how knowledge acquisition fits into the expert-system development cycle. They will take home a set of guidelines, techniques, and procedures to follow during their own projects. The tutorial will pay particular attention to problems that knowledge engineers are likely to encounter, how to avoid these problems, and how to correct them when they do occur. This tutorial does not discuss computer-based tools for knowledge acquisition or current research issues in the field. People who are interested in those topics should attend the tutorial "Tools for Knowledge Acquisition"

Prerequisite Knowledge: Basic familiarity with expert systems is assumed. Some experience building expert systems will be helpful, but is not required.

Speakers: Carli Scott and Jan Clayton, Expert Support, Inc.

SA5

Model-Based Diagnosis (IA)

This tutorial introduces model-based diagnosis of engineered systems, a domain-independent approach to diagnosis that compares faulty artifacts against models of their correct structure and behavior. The tutorial is aimed at (1) industry practioners and students who are working on diagnostic systems, and (2) other interested people seeking a general introduction to the field. We will answer three questions: (1) What is the model-based approach to diagnosis, and what can it buy you? (2) What are the components of a model-based system, and how are they built? (3) What are the issues involved in scaling up to significant, real-world applications? Our goal is to clearly separate and describe the major concepts in this field in a way that allows the attendants to combine them appropriately for their specific applications.

Prerequisite Knowledge: Familiarity with rule-based systems and constraint languages is useful but not required.

Speakers: Olivier Raiman and Mark Shirley, Xerox Palo Alto Research Center.

Sunday, July 14, 2:00–6:00 PM

SP1

Machine Learning and Its Role in KB Systems (ET)

Machine learning is beginning to move from academic laboratories into the engineering of practical knowledge-based AI systems. This tutorial provides a scientific basis for understanding the machine learning methods relevant to actual and potential applications, classifies the kinds of problem domains best suited for these methods, and provides some concrete case studies. Specific techniques include decision trees, clustering, macro-operators, explanation-based learning, analogy, and the integration of learning with problem solving. We will discuss the tools (such as ID3) that are available for implementing these techniques and we will discuss specific applications that have been fielded.

Prerequisite Knowledge: A general knowledge of artificial intelligence techniques, especially rule-based systems and problem solving.

Speakers: Jaime Carbonell, Department of Computer Science, Carnegie Mellon University, and Yves Kodratoff, Universite de Paris Sud LRI.

SP2

Neural Nets for Real World Problems (ET)

This tutorial will introduce participants to the neural network learning procedures that are most widely used in practical applications. These include backpropagation and its many recent variants, radial basis functions, elastic nets and kohonen maps. We will show how to apply these learning procedures to important practical problems including speech recognition, character recognition and segmentation, medical diagnosis, control of complex physical systems, vehicle guidance, bomb detection, adaptive interfaces and a variety of other tasks. We will illustrate methods of building domain specific invariants into the architecture of the network and will describe recent methods of speeding the learning

and improving the generalization.

The tutorial will explain the limitations as well as the strengths of the current neural network approaches and will give guidelines for deciding which tasks are suitable for neural networks.

Prerequisite Knowledge: Some familiarity with elementary calculus would be helpful but is not essential. No other technical background is required.

Speakers: David Touretzky, Carnegie Mellon University, and Geoffrey Hinton, Department of Computer Science, University of Toronto.

SP3

Object-Oriented Programming and Expert Systems (PI)

This tutorial will introduce participants to the concepts underlying object-oriented programming and its use in expert systems. We will consider the development of object-oriented programming concepts, their use in languages like C++, and their extension for knowledge engineering and expert systems development. We will introduce the basic problem types in expert systems and describe the various uses of objects in the knowledge bases and interfaces of these systems. We will review large expert systems applications in order to understand how object-oriented programming has been used in significant applications.

Prerequisite Knowledge: Familiarity with expert systems is assumed; knowledge of object-oriented programming concepts is not required.

Speakers: Jan Aikins, Aion Corporation, and Paul Harmon, *Intelligent Software Strategies Newsletter.*

SP4

Tools for Knowledge Acquisition (PI)

This tutorial will introduce participants to advances in knowledge acquisition, emphasizing new automated techniques that will facilitate development of the next generation of expert systems. We distinguish between knowledge acquisition at the "symbol level" and at the "knowledge level," and contrast conventional knowledge-engineering tools (such as expert-system shells) with recent approaches that offer developers both additional guidance and more useful abstractions by supporting knowledge acquisition at the knowledge level. We survey a number of computer-based tools that use knowledge of explicit problem-solving methods and of particular application domains to facilitate the development of operational knowledge bases. We also describe how metalevel knowledge-acquisition programs can create custom-tailored tools that support knowledge acquisition directly from experts. This tutorial complements the tutorial "Knowledge Acquisition from Experts," which provides an overview of interviewing techniques and of other nonautomated approaches to knowledge acquisition.

Prerequisite Knowledge: We assume that participants will have familiarity both with expert systems and with fundamental aspects of conventional knowledge engineering.

Speakers: Tom Gruber, Computer Science Department, Knowledge Systems Laboratory, Stanford University, and Mark Musen, Department of Medicine and Computer Science, Stanford University Medical Center

SP5

Using AI for Business Transformation (Realizing the Potential of AI in Business) (PI)

This tutorial will address the opportunities and challenges facing advocates of AI applications in business. We will identify and suggest solutions for key organizational barriers to using AI based solutions to enhance and transform business operations. Based on practical experience, we will share methods and costs to introduce AI into a large organization. The session will include interactive presentations, exercises and discussions to maximize the relevance for attendees. We will cite European and Asian as well as US experiences. We will stress the creativity, sponsorship, political and partnership issues necessary for success.

Prerequisite Knowledge: None. Attendees should be interested in practical discussion of introducing AI into the business environment (e.g. IS managers, non-technical managers and Knowledge Engineers).

Speakers: Donald Mick, DKM Associates, and Grady McGonagill, McGonagill and Associates.

Monday July 15, 9:00 AM–1:00 PM

MA1

Genetic Algorithms (ET)

This tutorial will introduce participants to the design and use of genetic search algorithms. Genetic algorithms are adaptive search algorithms inspired by models of heredity and evolution in the field of population genetics. We will discuss how genetic algorithms work, what problems genetic algorithms have been used for, and how to tailor the algorithms to a wide variety of other problems. At least half of the tutorial will be devoted to significant applications of genetic algorithms, with an emphasis on the pragmatic design choices made in developing successful applications.

Prerequisite Knowledge: No particular mathematical background is necessary, but some familiarity with search and optimization techniques may be helpful.

Speakers: Lawrence Davis, Tica Associates, and John J. Grefenstette, Naval Research Labs.

MA2

Knowledge-Based Scheduling (IA)

Scheduling is a ubiquitous problem confronting manufacturing companies, the DoD, NASA, and just about any company with complex operations environments. Examples of scheduling problems include job-shop scheduling, Air Force Tactical Mission Planning, DoD Logistics Planning, Space Shuttle Orbiter Maintenance and Repair, Space Shuttle Payload Preparations, and Hubble Space Telescope Science Observation Scheduling. Solutions to scheduling problems generally contain an assignment of times and resources to activities such that all required temporal relationships are maintained, no resource is overallocated or prematurely depleted, constraints are satisfied and objectives optimized. We will explicate the various scheduling problems encountered in real-world scenarios and suggest various AI-based techniques that address these problems. More specifically, we hope that the AI and OR audiences will be exposed to interesting new search problems and techniques, and the industrial audience will find solutions to their costly production problems.

Prerequisite Knowledge: Basic knowledge of AI.

Speakers: Mark Fox, The Robotics Institute, Carnegie-Mellon University, and Monte Zweben, Artificial Intelligence Research Branch, NASA Ames Research Center.

MA3

Mobile Robot Navigation (IA)

This tutorial is aimed at both AI researchers and roboticists. We will present an overview of the state of the art in mobile robot navigation, covering the subject areas of mobility kinematics, sensing and representation, motion plan generation, plan monitoring, as well as an overview of implemented mobile robot systems. The goal of this tutorial is two-fold. First, to have AI researchers better understand the capabilities and requirements of robot systems, so that they can more realistically include the idea of robot agents in their research systems. Second, to provide application roboticists with background and bibliographic information so that they can better implement a robot navigation system for their particular projects.

Prerequisite Knowledge: A basic understanding of AI search and knowledge representation techniques.

Speakers: David P. Miller, Jet Propulsion Laboratory, and Marc G. Slack, The Mitre Corporation.

MA4

The Craft of Exploiting AI Techniques in Human Computer Interface Design (PI)

This tutorial will cover techniques for effective use of AI techniques in the construction of interactive user interfaces. While the focus will be on pragmatic issues, the tutorial will also address metaphors underlying collaborative interface design and selected theoretical issues. A number of paradigmatic examples will be examined and analyzed in order to highlight techniques that have been successful as well as those that been unsuccessful. Useful management guidelines for user interface development projects and potential pitfalls will be discussed. An analysis of current interface tools and trends for the future will be provided.

Prerequisite Knowledge: This tutorial presupposes a basic understanding of knowledge representation (e.g. frames) and object-oriented programming.

Speakers: Michael D. Williams, Product Development, IntelliCorp, and James D. Hollan, Computer Graphics and Interactive Media Research Group, Bell Communications Research.

MA5

Truth Maintenance Systems (ET)

This tutorial explains the fundamentals of Truth-Maintenance Systems (TMS), which provide mechanisms for handling incomplete and inconsistent information and for managing constraints and search. We explore the design decisions underlying common TMS, including justification-based, logic-based, and assumption-based systems. We show how to incorporate TMS into problem solvers to provide dependency-directed backtracking and closed-world assumptions, and illustrate their use in diagnosis. Listings of working versions of all three types of TMS and programs which use them are included in the tutorial. Attendees will gain the background necessary to understand the current literature on truth maintenance systems, and learn how to evaluate, select and incorporate TMS techniques into applications.

Prerequisite Knowledge: Experience with AI problem solving and search strategies, including pattern-directed systems.

Speakers: Johan de Kleer, Xerox Palo Alto Research Center, and Ken Forbus, Northwestern University.

Monday, July 15, 2:00–6:00 PM

MP1

Case-Based Reasoning (ET)

Case-Based Reasoning (CBR) is a new AI methodology that applies past experience, as represented by prior cases, to current decision making. CBR systems handle such diverse tasks as planning, design, diagnosis, argumentation and negotiation. CBR requires a memory where past cases are organized. Successful cases are stored so they can be retrieved and used in similar situations. Failures are also stored so that they can warn the problem solver of potential difficulties and provide repairs. CBR research addresses such questions as the knowledge acquisition bottleneck, the brittleness of some expert systems, and the need to assess relevance in context. This tutorial program presents a comprehensive picture of current CBR research paradigms, examines issues and tradeoffs of design and building CBR systems and treats special research issues including learning from solved problems and integrating rules and cases.

Prerequisite Knowledge: This tutorial is intended for professionals interested in current CBR research issues, managers interested in alternative methodologies for expert system development, and knowledge engineers considering developing CBR applications. Familiarity with basic AI/expert systems concepts is assumed.

Speakers: Kevin D. Ashley, Learning Research and Development Center, University of Pittsburgh, and Katia P. Sycara, Robotics Institute, Carnegie Mellon University.

MP2

Distributed Artificial Intelligence (ET)

This tutorial will be a thorough survey of problems, techniques and applications in contemporary DAI. We'll develop a comprehensive picture of current DAI knowledge, to prepare participants building DAI systems or doing advanced research. Issues covered include rational multiagent decision-making, coherent cooperation, representing knowledge about other agents, inter-agent conflict resolution (e.g. using negotiation), multi-agent learning, implementation platforms such as ABCL, ACTALK, MACE, MERING-IV, etc. We will use numerous examples from existing DAI systems as a context to discuss both theoretical principles and practical implementation strategies.

Prerequisite Knowledge: Introductory-level knowledge of AI, including general knowledge of first-order predicate calculus, object-based systems, hierarchical and nonlinear planning, heuristic search, reasoning under certainty, etc.

Speakers: Les Gasser, Distributed AI Group, Computer Science Department, University of Southern California, and Jeffrey S. Rosenschein, Department of Computer Science, Hebrew University, Jerusalem, Israel.

MP3

Integrating Expert Systems and Neural Networks (ET)

This tutorial gives an overview of the developing synergism in the rapidly emerging fields of expert systems and neural networks. The topics include the theoretical basis and framework for understanding the integration of the technologies and case studies on practical applications. The tutorial starts with a summary of neural networks. Then, models for integrating expert systems and neural networks are presented to give a framework for analyzing the potential applications topics. Finally, a methodology is given for the development of integrated expert systems and neural networks. Case studies are used to clarify the concepts and guidelines. Participants will gain a clear idea of the state-of-the-art and learn guidelines for choosing appropriate applications.

Prerequisite Knowledge: Familiarity with expert systems. Experience with applications development helpful.

Speakers: Larry R. Medsker, Department of Computer Science, American University, and David L. Bailey, George Washington University.

MP4

Planning: From Prediction to Reaction (IA)

This tutorial introduces participants to modern AI planning techniques. There are three basic objectives of the tutorial. The first is to present a coherent review and analysis of classical planning techniques. The second is to describe more recent developments in the field, including practical applications, learning, and reactive systems. The third objective of this tutorial is to establish the relationship between AI planning and other disciplines such as operations research and control theory. The tutorial has a pragmatic flavor: a variety of problems are used to motivate the material, ranging from classical problems found in the research literature to more practical problems found in particular applications.

Prerequisite Knowledge: Familiarity with basic AI concepts, such as state-space search, at the level of an introductory tutorial or course.

Speakers: Mark Drummond and Steve Minton, NASA Ames Research Center.

MP5

Verification and Validation (PI)

The purpose of this tutorial is to provide participants with a summary of the primary concepts in the verification and validation (V&V) of expert systems. The tutorial presents a hierarchical approach to expert systems quality, that includes V&V. Then the techniques associated with verification of rules, frames and other types of knowledge representation are investigated. Considerable attention is focused on the structuring, design and implementation of validation tests. This is followed by a review of what actually is done in practice.

Prerequisite Knowledge: This tutorial is designed for the system developer interested in some of the primary techniques and approaches to V&V, the system manager concerned with ensuring that the appropriate tests are used, and management concerned with quality assurance.

Speakers: Kirstie Bellman, The Aerospace Corporation, and Daniel O'Leary, School of Business, University of Southern California.

8 Hotels & Transportation

Housing

AAAI has reserved a block of rooms in Anaheim hotel properties at reduced conference rates. To qualify for these rates, housing reservations, including requests for suites, must be made with the Anaheim Visitors and Convention Bureau Housing Office. A deposit must accompany your housing form to guarantee your reservation. Checks and money orders should be made payable to AAAI Housing Bureau. AMEX, Diner's Club, MasterCard, and Visa are also accepted.

The Anaheim Visitors and Convention Bureau Housing Office will acknowledge the receipt of your reservation. If you do not receive an acknowledgement within a reasonable period (2-3 weeks), follow up your original request with a confirming letter. Should your choice(s) for housing not be available, your reservation will be forwarded to a comparable property.

The deadline for housing reservations is June 14, 1991. Reservations received after this date cannot be guaranteed housing availability or special rates. It is recommended that you act early to guarantee that space is available. Changes or cancellation of your reservations should be made directly with the Anaheim Visitors and Convention Bureau. All rates quoted are per person and subject to a room tax of 11%. Please see map on page 10.

Co-Headquarter Hotels

Anaheim Marriott
700 West Convention Way
$98.00 (S); $115 (D), $125.00 (T); $135.00 (Q)
(Children under 18 stay free in parents' room in existing bed space.)
Distance to Center: Adjacent

Anaheim Hilton
777 Convention Way
Main Bldg: $108.00 (S); $118.00 (D)
Lanai: $118.00 (S); $128.00 (D)
Towers: $138.00 (S); $148.00 (D)
Distance to Center: Adjacent

Other Hotels

The Inn at the Park
1855 South Harbor Boulevard
$68.00 (S/D/T/Q)
Distance to Center: 1 block

The following hotels have been reserved for students. Proof of full-time student status must accompany housing form.

Castle Inn
1734 South Harbor Boulevard
Rates: $50.00 (S/D)
Distance to Center: 1½ blocks

Convention Center Inn
2017 South Harbor Boulevard
Rate: $50.00 (S/D/T/Q)
Distance to Center: 1½ blocks

Magic Carpet Motel
1016 West Katella Avenue
Rate: $50.00 (S/D/T/Q)
Distance to Center: ½ block

Magic Lamp Motel
1030 West Katella Avenue
Rate: $50.00 (S/D/T/Q)
Distance to Center: ½ block

Raffles Inn & Suites
2040 South Harbor Boulevard
Rate: $50.00 (S/D/T/Q)
Distance to Center: 1½ blocks

Westward Ho/Seven Seas Hotel
415 Katella Avenue
Rate: $50.00 (S/D/T/Q)
Distance to Center: 1½ blocks

Air Transportation

The American Association for Artificial Intelligence has selected United Airlines as the official carrier. Negotiated fares will reflect a savings of 5 percent off any applicable discounted fare or 45 percent off United or United Express unrestricted coach (y/yn/y9/y29) fares in effect. Tickets must be purchased 7 days before the conference and reservations must be made in M class of service. AAAI's preferred travel agent is Custom Travel, phone 415/369-2105 or 800/367-2105. You or your travel agent may also call United Airlines at 800/521-4041 between 8:00 AM and 11:30 PM E.S.T. Please give the special discount code: 430TK.

Restrictions: Reservations for flights requiring advance purchase must adhere to all restrictions that apply to that fare. Regular coach fares and some other nonrestrictive fares do not require advance booking but all tickets must be issued at least 7 days before the conference. To be sure of availability, book early. In order to qualify for these special discounted fares, travel must be round-trip within the continental United States and travel must take place between July 10 and July 22, 1991.

Ground Transportation

This information is the best available at time of printing. Please confirm fares when making reservations.

Airport Connections

Several companies provide service from the Los Angeles International (LAX) and John Wayne-Orange County (SNA) Airports to the Anaheim area. A sampling of companies and their one-way rates are shown below. Contact the company directly for reservations.

In addition to the firms listed below, Airport Coach offers regularly scheduled service from both LAX and SNA to the Anaheim Convention Center. Round trip rates are $17.50 and $12.00 respectively. Service runs from 4:30 AM to 1:30 AM daily. No reservations are required.

Airport Express
714/856-0543
LAX to Anaheim $62.00, 1-4 persons
SNA to Anaheim $30.00, 1-4 persons

Amtrans Airport Shuttle
714/220-1122
LAX to Anaheim $30.00 1st person, $7.00 each additional person
SNA to Anaheim $20.00 1st person; $7.00 each additional person

Prime Time Airport Shuttle
818/901-9901
LAX to Anaheim $36.00 1st person; $7.00 each additional person
SNA to Anaheim $23.00 1st person; $7.00 each additional

Super Shuttle
714/973-1100
LAX to Anaheim $12.50 1st person; group rate available
SNA to Anaheim $12.50 1st person; group rate available

(A Super Shuttle representative will be in onsite registration July 17-18 to assist with your return reservation.)

Budget-Conscious?

Register by May 17, 1991 for substantial savings.

Make your housing and airline reservations early for best prices!

Car

AAAI has selected Hertz Rental Car as the official car rental agency for AAAI–91. Special rates will be honored from July 7–26, 1991, and include unlimited mileage. For reservations, please call Custom Travel at 415/369-2105 or 800/367-2105. You may also contact the Hertz convention desk at 800/654-2240, identify yourself as an AAAI-91 attendee, and give the code 7565.

Terms and Conditions: Applicable charges for taxes, optional refueling service, PAI, PEC and LIS are extra. Optional LDW may be purchased at $9.00 per day. Rates are non-discountable. Rentals are subject to Hertz age, driver's license and credit requirements as well as car availability at the time and place of rental. Weekly rentals are for 5 to 7 days. Weekly minimum rental periods are: Sunday or Monday pickup, 6 days; Tuesday through Saturday pickup, 5 days. 3-4 day rate must include Friday or Saturday overnight, 4 day maximum period. Cars must be returned to renting location or major Southern California airport. 3-4 day rate must be returned to renting location.

Parking will be available in the lot facing the Anaheim Convention Center off Katella Avenue at $5.00 per day. Please see map on page 10.

Bus

The Anaheim Greyhound station is located at 2080 South Harbor Boulevard, approximately one block from the Convention Center. 714/635-5060.

Rail

Amtrak has a station in the Anaheim Stadium at 2150 East Katella Avenue, approximately 1 mile from the Convention Center. 714/385-1448.

***Disclaimer*:** In offering United Airlines, Hertz Rental Cars, KiddieCorp, and all other service providers (hereinafter referred to as "Supplier[s]") for the National Conference of Artificial Intelligence, AAAI acts only in the capacity of agent for the Suppliers which are the providers of the service. Because AAAI has no control over the personnel, equipment or operations of providers of accommodations or other services included as part of the NCAI program, AAAI assumes no responsibility for and will not be liable for any personal delay, inconveniences or other damage suffered by conference attendees which may arise by reason of (1) any wrongful or negligent acts or omissions on the part of any Supplier or its employees, (2) any defect in or failure of any vehicle, equipment or instrumentality owned, operated or otherwise used by any Supplier, or (3) any wrongful or negligent acts or omissions on the part of any other party not under the control, direct or otherwise, of AAAI.

Tour Program

All tours take place on Thursday, July 18, and include transportation from the Anaheim Convention Center to the site and return. Tour times do not include travel time. Register early as space is limited for each tour. Please see registration form.

Jet Propulsion Laboratory, California Institute of Technology

Pasadena, 2:00–5:30 PM, $20.00 per person (includes box lunch).

An overview of activities at JPL and within the NASA planetary exploration program, including the Space Flight Operations Facility, the Spacecraft Assembly Facility Viewing Gallery, Galileo and Voyager prototypes, and the Artificial Intelligence Laboratory with demonstrations of AI applications to spacecraft mission operations, mission planning, and micro-robotics for planetary surface exploration.

Rockwell International

Downey, 7:00–8:30 PM, $20.00 per person (includes box dinner).

Includes tour of Rockwell's Design, Evaluation, and Inspection Room, which houses a full-scale mock-up of the shuttle spacecraft, the actual Apollo 14, and a full-scale mock-up of a space station. Also inclues a film and presentation by Jonathan Vos Post (M.S. in AI), an aerospace engineer at Rockwell, who works with advanced software engineering, AI, new business, manned and unmanned spacecraft.

University of California

Irvine, 2:00, 3:00 or 4:00 PM. (Assignments made by AAAI). $10.00 per person (includes refreshments).

Extensive demonstrations at the Artificial Intelligence and Machine Learning Laboratory. Examples include AMAL and AbEL, DEPLAN, SIERES, ML-NDE, and PII.

Interaction & Growth

These are the themes and goals of AAAI–91. We collocated IAAI–91 with the National Conference in an effort to help you achieve these goals.

A special discount fee for the IAAI–91 of $95 is offered to technical registrants of AAAI–91.

Disneyland Ticket Special Offer

Disneyland Convention Passports at **25% off** the regular admission price are available through the AAAI. They may be used during park hours **from July 15-19, 1991 only.** A passport entitles you to unlimited use of all attractions (except arcades) plus free parking.

Adults: $20.50

Children, ages 3–11, $16.75.

Please see registration form on page 11 to apply.

Child Care

Child care will be provided by KiddieCorp. Their experienced staff will offer CLUB KID, a program geared towards infants, preschool and school-age children up to age 11. Fees include age-appropriate games and toys; arts and crafts; a separate, supervised nap room; movies and videos; and snacks. Morning sessions include lunch.

The schedule for CLUB KID is:

Sunday, July 14

Session I	Session II
8:00 AM–1:00 PM	1:00–6:30 PM

Monday, July 15

Session I	Session II
8:00 AM–1:00 PM	1:00–6:30 PM

Tuesday, July 16

Session I	Session II
8:00 AM–1:00 PM	1:00–7:30 PM

Wednesday, July 17

Session I	Session II
8:00 AM–1:00 PM	1:00–6:00 PM

Thursday, July 18

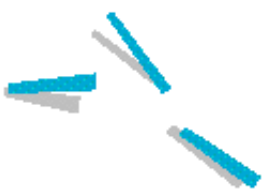
Session I	Session II
8:00 AM–1:00 PM	1:00–7:30 PM

Friday, July 19

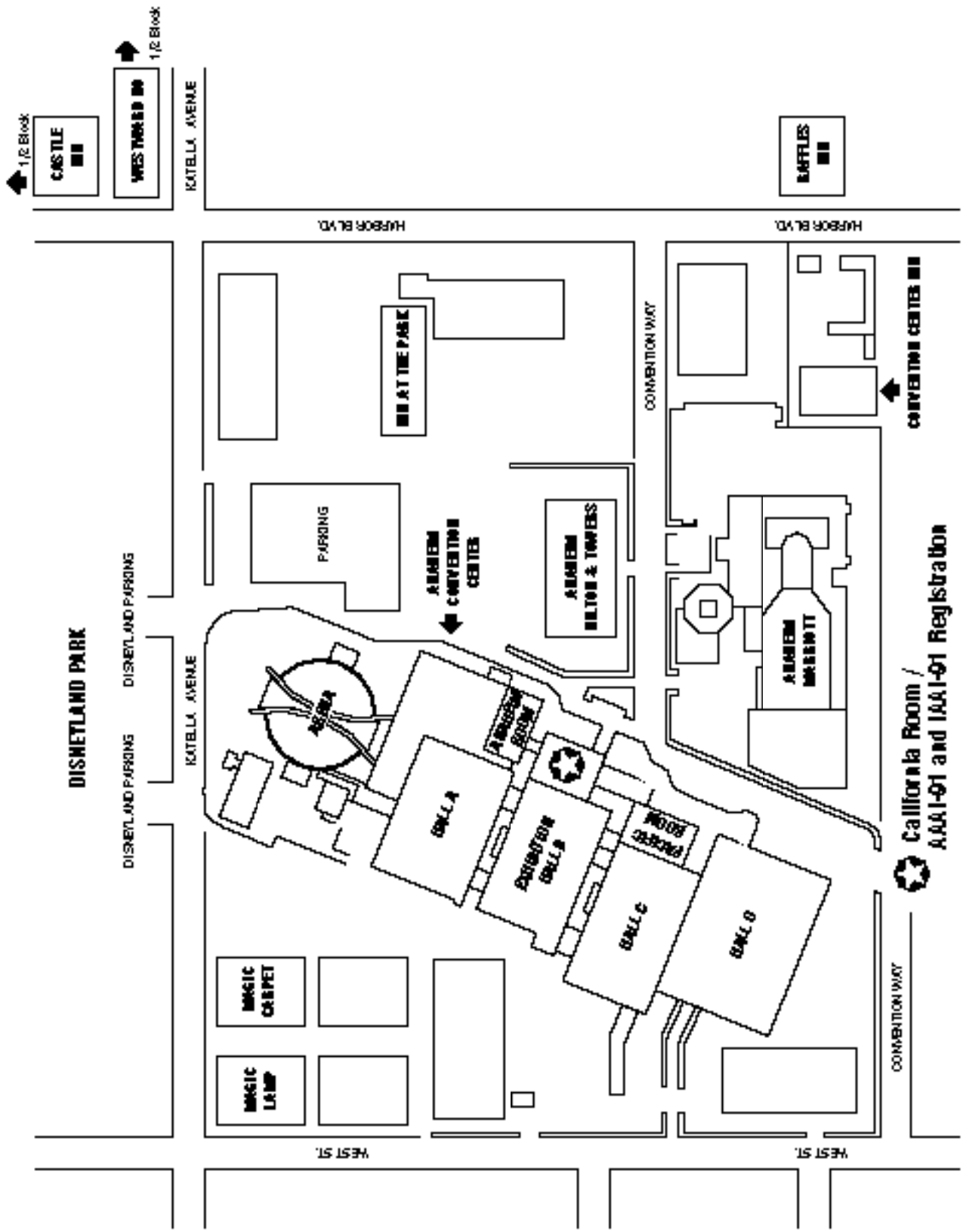
Session I
8:00 AM-12:30 PM

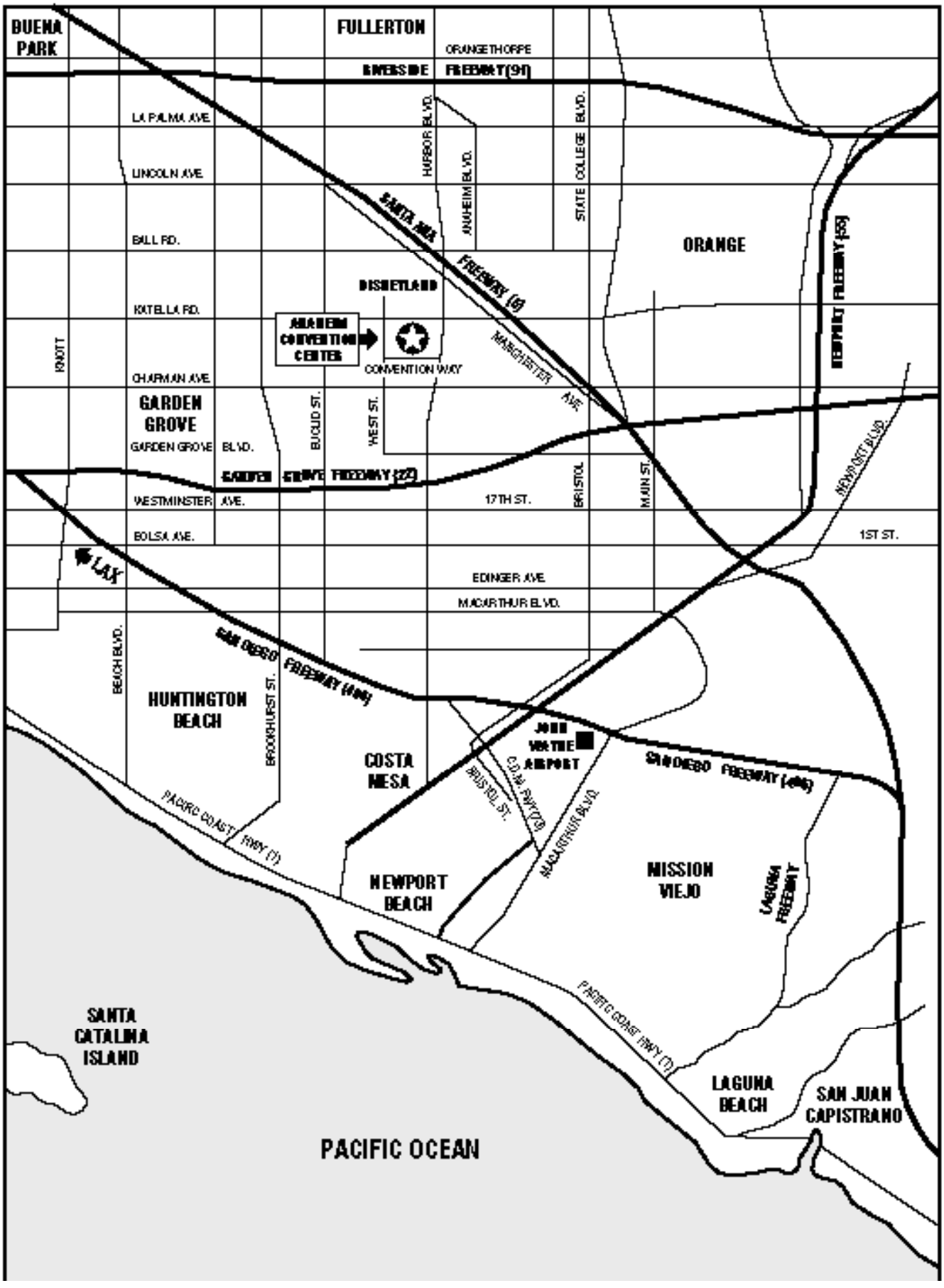
Cost is $5.00 per hour per child. To register, complete the form and return to AAAI before May 17, 1991. Inquiries regarding CLUB KID should be directed to KiddieCorp at 619/455-1718.

Please see application on page 12, and note the disclaimer information on the first column, lower left, of this page.



10 Maps


DISNEYLAND PARK
DISNEYLAND PARKING
DISNEYLAND PARKING
KATELLA AVENUE
KATELLA AVENUE
HARBOR BLVD.
HARBOR BLVD.
CONVENTION WAY
CONVENTION WAY
WEST ST.
WEST ST.
1/2 Block
1/2 Block
CASTLE
MAGIC CARPET
MAGIC LAMP
PARKING
ANAHEIM CONVENTION CENTER
ANAHEIM HILTON & TOWERS
ANAHEIM MARRIOTT
AT THE PARK
CONVENTION CENTER
HALL A
EXHIBITION HALL B
HALL C
HALL D
California Room /
AAAI-91 and IAAI-91 Registration


BUENA PARK
FULLERTON
ORANGETHORPE
RIVERSIDE FREEWAY (91)
LA PALMA AVE.
LINCOLN AVE.
BALL RD.
KATELLA RD.
CHAPMAN AVE.
HARBOR BLVD.
ANAHEIM BLVD.
STATE COLLEGE BLVD.
SANTA ANA FREEWAY (5)
ORANGE
RIVERSIDE FREEWAY (55)
DISNEYLAND
ANAHEIM CONVENTION CENTER
CONVENTION WAY
MANCHESTER AVE.
KNOTT
GARDEN GROVE
GARDEN GROVE BLVD.
BUCUD ST.
WEST ST.
GARDEN GROVE FREEWAY (22)
WESTMINSTER AVE.
17TH ST.
BRISTOL
MAIN ST.
NEWPORT BLVD.
1ST ST.
BOLSA AVE.
LAX
EDINGER AVE.
MACARTHUR BLVD.
BEACH BLVD.
SAN DIEGO FREEWAY (405)
HUNTINGTON BEACH
BROOKHURST ST.
COSTA MESA
JOHN WAYNE AIRPORT
SAN DIEGO FREEWAY (405)
BRISTOL ST.
C.D.M. PKWY (73)
MACARTHUR BLVD.
PACIFIC COAST HWY (1)
NEWPORT BEACH
MISSION VIEJO
LAGUNA FREEWAY
PACIFIC COAST HWY (1)
SANTA CATALINA ISLAND
LAGUNA BEACH
SAN JUAN CAPISTRANO
PACIFIC OCEAN

erican Association for Artificial Intelligence
Burgess Drive
nlo Park, California 94025-3496
/328-3123

tmaster: Time Dependent Material.

TURE SITES OF THE NATIONAL ONFERENCE ON TIFICIAL INTELLIGENCE

AI–92
n Jose, California—*July 12–16, 1992*

AI–93
shington, DC—*July 11–16, 1993*

AI–95
ntreal, Quebec, Canada—*August 20–25, 1995*