



THE EIGHTH
NATIONAL
CONFERENCE
ON ARTIFICIAL
INTELLIGENCE

AAAI-90

Proceedings Eighth National Conference on Artificial Intelligence

Sponsored by the
American Association for
Artificial Intelligence

July 29, 1990 – August 3, 1990

Volume One

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Foreword

This volume comprises the written record of research presented at the Eighth National Conference on Artificial Intelligence. The American Association for Artificial Intelligence (AAAI), the sponsor of this conference, is a technical society whose principal goal is to promote research in the field, primarily through its annual national conference. Thus, this volume is to some extent a capsule summary of the current scientific state of AI.

We have endeavored to produce an interesting conference of the highest technical quality. AAAI has always prided itself on its careful reviewing process and its consistent high standards for acceptance of submitted papers. Each of the 926 papers submitted to the conference was read by at least two members of the Program Committee, which, as you will note (p. v), is a sizable body of well-respected and technically expert researchers. After all of the papers were read, the entire Program Committee met face to face, and each paper was discussed until a final decision was agreed upon (where necessary, additional reviews were obtained from other members of the committee). Ultimately, 161 papers were accepted for presentation at the conference and for publication in these proceedings.

Because of the continuing growth of research activity in AI and the associated increase in the number of papers submitted, this year's Program Committee was the largest ever assembled for the National Conference. The successful op-

eration of the Program Committee depended on the hard work of the Area Chairs, who took responsibility for recruiting reviewers in each area and for coordinating the review process. Another essential ingredient of the review process was the wisdom and hard work contributed by the AAAI office staff (p. v). Finally, each Co-Chair was assisted by an Associate Chair, who helped in all phases of the process. We wish to thank the staff, the associate chairs, the area chairs, and all members of the Program Committee for their efforts.

In addition to technical papers, the conference also includes a collection of invited talks and panels. Peter Friedland took responsibility for collecting nominations, tallying votes by the Area Chairs, and inviting the speakers and panels. To the extent possible, we have included written versions of these talks and panels in these proceedings.

In sum, you hold in your hands a volume of the highest-quality short papers on current research in AI. As these papers demonstrate, research in artificial intelligence continues its vigorous and exciting growth. We hope you enjoy this most challenging of intellectual adventures.

Tom Dietterich
William Swartout
Program Co-Chairmen, AAAI-90

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Sunday, July 29

Registration: Hynes Convention Center, Hall B 7:30 am—6:00 pm

Workshops: 8:00 am—6:00 pm

Monday, July 30

Registration: Hynes Convention Center, Hall B 7:30 am—6:00 pm

MA Tutorials: 9:00 am—1:00 pm

Workshops: 8:00 am—6:00 pm

Tuesday, July 31

Registration: Hynes Convention Center, Hall B 7:30 am—6:00 pm

Workshops: 8:00 am—6:00 pm

Exhibit Program: Hynes Convention C

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Introduction—Raj Reddy, Past President AAAI
AAAI Presidential Address—Daniel G. Bobrow, Xerox Palo Alto
 Research Center, "Dimensions of Interaction: Looking Towards an
 Interaction Level"
Invited Speaker—Samuel Fuller, Vice President, Corporate Research
 & Architectures, Digital Equipment Corporation, "Why Is It So Hard
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Technical Session: 11:00 am—12:40 pm
Invited Speaker—Ronald Brachman, AT&T Bell Laboratories,
 "The Future of Knowledge Representation"
 Automated Reasoning: Distributed and Parallel Systems
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Wednesday, August 1

Registration: Hynes Convention Center, Hall B 7:30 am—6:00 pm

Workshops: 8:00 am—6:00 pm

Exhibit Program: Hynes Convention Center, Halls C & D 10:00 am—6:00 pm

Technical Session: 8:30 am—10:10 am
Invited Speaker—Jon Doyle, Massachusetts Institute of Technology,
 "Rationality & Its Roles in Reasoning"
 Intelligent Multi-Media Interfaces
 Machine Learning: Learning & Problem Solving
 Automated Reasoning: Constraint Satisfaction Problems I
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 Automated Reasoning: Theorem Proving I & Program Synthesis

Technical Session: 11:00 am—12:40 pm
Invited Panel—"User Modeling & User Interfaces"
 Automated Reasoning: Evidential Reasoning
 Machine Learning: Inductive Learning II & Relational and
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 Theorem Proving II: Term Rewriting

Thursday, August 2

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Workshops: 8:00 am—6:00 pm

Exhibit Program: Hynes Convention Center, Halls C & D 10:00 am—5:00 pm

Technical Session: 8:30 am—10:10 pm
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 Technology, "Truth Maintenance Systems"
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Technical Session: 11:00 am—12:40 pm
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 Automated Reasoning: Planning II
 Knowledge Representation: Complexity & Expressiveness

Friday, August 3

Registration: Hynes Convention Center, Hall B 7:30 am—11:30 am

Technical Session: 8:30 am—10:10 am

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 "Massively Parallel AI"
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 Machine Learning: Generalization & Specialization
 Robotics: Intelligent Mobile Robots
 Knowledge Representation: Architectures

Technical Session: Plenary Address 11:00 am—12:40 pm

Introduction—Daniel G. Bobrow, President AAAI
Invited Speaker—Craig Fields, Department of Defense,
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SCHEDULE

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2:00 pm—6:00 pm

12:00 pm—7:00 pm	
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