

AAAI-06 Conference Preface

Welcome to the Twenty-First National Conference on Artificial Intelligence, AAAI-06! 2006 is a special year for the AI research community because we celebrate the fiftieth anniversary of the Dartmouth project where the term "artificial intelligence" was first introduced by John McCarthy as the topic of investigation. AAAI-06 celebrates the growth and diversity of our field and includes a number of new features to encourage wide participation of researchers and practitioners in the field and related disciplines.

In addition to the traditional technical papers, tutorials, workshops, student programs, demonstrations, and competitions that have become standard at the AAAI conference, this year we introduced several new submission tracks, in an attempt to increase diversity and participation. First, we introduced two special tracks in the technical program specifically inviting papers on integrated intelligent capabilities and artificial intelligence and the Web to attract more submissions in those areas. The first track targets papers that highlight the role of integrating multiple component technologies (for example, reasoning, vision, speech, memory, language, planning, problem solving, and learning) in achieving intelligent behavior. The second track focuses on applying AI techniques to increase the capabilities of the World Wide Web and vice-versa. We also introduced a senior member presentation track that provides an opportunity for established researchers to give a broad talk on an important new research direction, a well-developed body of research, or a thoughtful critique of trends in the field. These presentations are intended to provide a big-picture view, in contrast to the regular papers, which typically focus on a specific technical contribution. Also new this year is the nectar (new scientific and technical advances in research) track, which exposes AAAI-06 attendees to important ideas that have been published in other venues. As AI has matured and become increasingly interdisciplinary, many of the field's most exciting results appear in the proceedings of AAAI's "sister" conferences and conferences in related fields. The nectar track is designed to collect the best and most relevant of these results and present them in a way that is accessible

to a broader audience. Therefore, this track consists of shorter papers that are based on a result that has already appeared in the proceedings of at least one other major AI-related conference. We also continue the sister conference highlights track introduced last year, with representatives of a few highly visible AI conferences to give overviews of recent developments presented at those meetings. These programs aim to make AAAI an "AI hive" for new ideas in our increasingly diverse field. Finally, we introduced a member abstracts and poster program, to provide a forum in which AAAI members could present and discuss their on-going research based on a short submitted abstract, rather than a full AAAI conference paper.

Overall, we received a total of 774 submissions to the main technical program, which included 105 submissions to the AI and the Web track and 39 submissions to the integrated intelligent capabilities track. Of these, 236 (30 percent) were accepted, of which 171 were designated for oral presentation and 65 for poster presentation because not all papers could fit in the planned schedule. There were also 60 submissions to the new nectar track, of which 35 were accepted, 12 of them to be presented as posters. Finally, there were 29 submissions to the new senior member track, of which 12 were accepted. Overall, this gave a total of 863 submissions, a slight increase over AAAI-05, which already had an 80 percent increase over recent years. We also received 30 submissions to the new member abstracts and poster program, of which 19 were accepted. The submissions came from 44 countries, with 444 papers from outside the US.

For submissions to the main technical program, we made several changes to the reviewing process that we believe improved its overall quality. First, to reduce reviewer load, we recruited a significantly larger review committee than previous years, consisting of 40 senior program committee (SPC) members and 535 program committee (PC) members. Once the papers were submitted, all SPC and PC members bid on papers to review. Next, an automated assignment algorithm made initial assignments of each paper to one SPC member and three PC members based on bids and keywords. The program chairs manually reviewed and adjusted the automat-

ic SPC assignments, assigning at most 17 papers to each SPC member. SPC members then reviewed the initial PC assignments for their assigned papers and made manual adjustments, exploiting their expert knowledge of the area and of the reviewers. Each reviewer received at most seven papers to review. Special track submissions were assigned one reviewer from the main track and two reviewers from the special track's program committee. All reviewing was double-blind. The initial reviews from the PC and often the papers themselves were read by the assigned SPC member, and a discussion among reviewers was initiated. We requested author feedback—a new step introduced by last year's chairs that allows authors to see the reviews and clarify any issues or misunderstandings. Author feedback was then taken into account for the final discussion, and when necessary, additional reviews were collected. Discussions were often very detailed and in most cases led to resolution of issues brought up by the reviewers. For cases where the decision was controversial or unclear, the SPC member wrote a metareview for the authors and the program cochairs, summarizing the positives and negatives of the paper. Finally, the program cochairs read the metareviews and reviews and initiated discussion with other SPC members when needed. Papers with unusual topics were given more extensive reviews and careful consideration. Final decisions were then made by the program cochairs based on everyone's recommendations, with a final calibration for differences among individual reviewer scores in light of the overall decisions and a final assignment of accepted papers to presentation slots in the planned schedule and the remainder to poster slots.

While it is impossible to flawlessly manage hundreds of papers and hundreds of reviewers, we were witness to a tremendous amount of hard work and careful consideration done by the entire program committee. We sincerely thank all of the SPC and PC members for their dedicated efforts, with particular thanks to Tim Finin and Dragomir Radev who cochaired the track on AI and the Web and to Art Graesser and Reid Simmons who cochaired the track on integrated intelligent capabilities. We also thank Ken Barker who, as technical program software chair, helped with various issues involving the conference review management software.

Submissions to the nectar, senior member, and member abstracts and posters tracks were reviewed by separate review committees. We thank the chairs of these new tracks for helping to structure and recruit papers for these new tracks and for managing the review process, namely AnHai Doan and Elaine

Rich, who cochaired the nectar track; Kathy McKeown and Dan Weld, who cochaired the senior member papers; and Dieter Fox and Ion Muslea, who cochaired the member abstracts and posters program.

We also thank Ken Forbus who, as general conference chair, aided in the overall organization of the conference and provided valuable advice on a variety of topics. We were also extremely fortunate to have dedicated subchairs who worked very hard in putting together exciting tutorial, workshop, demonstration, student abstract, and doctoral consortium programs. Carla Gomes and Qiang Yang assembled an excellent tutorial program, consisting of 15 tutorials covering material of interest to junior and senior researchers alike. Joyce Chai and Keith Decker selected a workshop program consisting of 17 workshops devoted to a variety of timely topics. Rob Miller and Biplav Srivastava selected 13 entries for the intelligent systems demonstration program. Jeffery Forbes and Paul Rybski organized a great mobile robot competition and exhibition. Maria Fox and Sailesh Ramakrishnan coordinated the student abstract program and selected 27 submissions. Kiri Wagstaff organized the AAI/SIGART doctoral consortium and selected 14 participants. Illah Nourbakhsh, who was our sponsorship chair, helped recruit external sponsors for the conference. We also thank our industrial sponsors for supporting the conference financially. As associate chairs for student participation, Martin Michalowski and Matt Michelson provided valuable help in organizing information and events for students attending the conference. We are also grateful to Michael Genesereth for organizing the general game playing competition started last year. This year, we added the new poker competition, and we thank Jonathan Schaeffer for organizing this event.

We are extremely pleased that Tim Berners-Lee, director of the World Wide Web consortium and inventor of the World Wide Web, has agreed to give the keynote speech for the conference. His leadership in the formation of the semantic web will continue to be critical in fostering a greater presence of AI research on the web architecture with broader benefits to the future of both. In addition, we thank the four distinguished researchers, Pedro Domingos, Ken Koedinger, Karen Myers, and Dan Roth, who agreed to give invited talks at the conference. We would also like to thank Bruce Buchanan and Tom Mitchell for organizing the AAI Fellows fiftieth anniversary panel.

We sincerely thank the AAI staff for their incredible support. Very special thanks are due to Carol

Hamilton and Keri Harvey, whose hard-earned experience with the conference and continuing, ubiquitous assistance have been invaluable. We also thank Jim Hendler and the rest of the AAAI conference committee for their advice. Last but not least, we thank Manuela Veloso and Subbarao Kambhampati for passing on invaluable lessons from their experience chairing the conference last year.

Fifty years after the Dartmouth project, we remember the words of AAAI's first president:

We are a scientific society devoted to the study of artificial intelligence. Our incorporating charter, with the characteristic precision of legal documents goes no further than to record the words "artificial intelligence" as an indicator of our proper object of concern. Of the semantics behind these terms, by its silence, it leaves it to us, the society, to determine.

... The society has taken the name "Artificial Intelligence." As all good AI'ers know, this name, introduced by John McCarthy in the 1950s, has been controversial for quite awhile. It is often remarked that some of the controversy that swirls around our field is due to our name - the suspicion of people outside AI, including some in computer science, that our enterprise is not a legitimate scientific enterprise... I believe that the controversies have their natural cause in the type of knowledge our science reveals. They must be dealt with on the basis of substance and truth.

So cherish the name "Artificial Intelligence." It is a good name. Like all names of scientific fields, it will grow to become exactly what its field comes to mean. "

- Allen Newell, "AAAI President's Message" (1980)

These proceedings present a compilation of what AI research has come to be, a field that extends its arms into many disciplines and does not shy away from theoretical or real-world challenges. We hope that this year's AAAI conference will more than ever, in Newell's words, be a forum "to encourage its [science's] happening, to permit communication about it, to gather those who want to talk about it in one place, and in general to conserve, cherish, and celebrate its content." We hope you will find AAAI-06 to be a unique vantage point to envision the next fifty years.

- Yolanda Gil and Raymond J. Mooney

IAAI Conference Preface

Welcome to the Eighteenth Annual Conference on Innovative Applications of Artificial Intelligence (IAAI-06). The purpose of this conference is to discuss, document, and—indeed—to celebrate the maturation of AI technologies into successful applications.

IAAI is organized as an independent program within the AAAI Conference, with schedules coordinated to allow attendees to move freely between AAAI and IAAI sessions. We appreciate the cooperation of the AAAI organizers, since we believe the colocated conferences both benefit from each other.

AI application developers benefit from learning about the latest AI methods that will enable the next generation of applications. AI researchers benefit by exposure to the challenges of real-world domains and business problems. IAAI-06 addresses the full range of AI methods including knowledge-based systems, constraint systems, multiagent systems, learning, data mining, natural language processing, and personalization technologies.

The conference showcases applications of two types: deployed and emerging. Deployed applications are case studies that provide working guidelines on designing, building, managing, and fielding systems that incorporate AI technologies. This year's papers address applications to customer support, manufacturing, procurement, sourcing, hardware verification and power distribution. These applications provide clear evidence of the impact and value of AI technology in today's world.

Papers on emerging applications and technologies describe efforts whose goal is the engineering of AI applications. They inform researchers about the utility of specific AI methods for application domains and also inform application developers about the emerging tools and techniques that will enable the next generation of new applications.

We are very excited about our three invited speakers. The Robert Engelmores Memorial Award and Lecture for 2006 will be given by Bruce Buchanan, one of the pioneers of knowledge based systems. Buchanan's talk will reflect on what's been learned about formulating knowledge in computer programs, and what challenges lie ahead.

Neil Jacobstein, president and CEO of Teknowledge Corporation, will give an invited talk on "Elec-

trifying Knowledge Work: 362 Innovative Applications of Artificial Intelligence 1989–2006." This talk will be a data-driven analysis of the types of AI applications that have been pursued in recent years, and it will update his analysis presented at the conference exactly ten years ago.

Sebastian Thrun, director of Stanford's Artificial Intelligence Laboratory and the leader of the team that won the 2005 DARPA Desert Challenge, will give a keynote talk on the software architecture of their robot vehicle. This is a remarkable success story for the deployment of AI technologies, with enormous practical, scientific, and societal ramifications.

The Innovative Applications of Artificial Intelligence Conference could not take place without the generous help of many people. In particular, we very much appreciate the hard work and dedication of the IAAI-06 program committee, without whom the technical program would be impossible. We want to acknowledge the professional administrative and planning expertise of Carol Hamilton, Keri Harvey and the entire AAAI staff. They are great to work with, and they make this conference possible. Thanks also to the authors of technical papers submitted to IAAI. They provide the evolutionary basis of a quality learning experience. We also want to thank our extraordinary speakers this year. They took time out of very compressed schedules to share their insights with the participants in IAAI-06.

We hope you enjoy the conference!

– Bruce Porter and William Cheetham

