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Editorial Introduction to this Special Issue of AI Magazine

The Eleventh Innovative Applications of Artificial Intelligence Conference (IAAI-99)

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The Eleventh Innovative Applications of Artificial Intelligence Conference was held 18–22 July 1999 in Orlando, Florida. Ramasamy Uthurusamy was the program chair, and Barbara Hayes-Roth was the program cochair. IAAI-99 was a special occasion that provided an opportunity to reflect on a decade of IAAI conferences and contemplate the potential contributions in the coming decade. In addition to the three invited talks that specifically addressed these areas, IAAI-99 showcased some exciting and innovative applications. Although all the IAAI-99 papers and talks were certainly interesting and important, we present in this special issue of *AI Magazine* only a select subset because of page and other limitations. We include two invited talks and four applications as a snapshot of IAAI-99.

The IAAI conference was initiated a decade ago to provide yearly updates of case studies of deployed applications that have measurable benefits and whose value depends on the use of AI technology. The case studies provide a valuable guide to designing, building, managing, and deploying systems that incorporate AI technologies. These applications provide clear evidence of the impact and value that AI technology has in today's world.

Researchers engaged in basic AI research also benefit from learning about challenges of real-world domains and the difficulties in applying AI techniques to real problems. The systems that are constructed and described, and that are demonstrated to work, provide experimental data for those inclined to study them. Authors of IAAI papers are encouraged to discuss the limitations of current techniques and analyze reasons for false starts. Although failures are more difficult to describe, especially within the page limits, these insights provide useful negative results that further inform the experimentalists about the limitations of various techniques.

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As did the 1997 and 1998 conferences, IAAI-99 augmented these case studies with papers that address emerging areas of AI technology or applications. Papers in the Emerging Applications and Technologies track describe efforts whose goal is the engineering of AI applications, with programs that are nearly ready for fielding. The emerging techniques papers inform AI researchers about the utility of specific AI techniques for applications domains and also inform applications developers about tools and techniques that will enable the next generation of new and more powerful applications. Although they do not meet all the same criteria as the deployed applications—namely, the systems are out of the hands of the developers, in use for more than a couple of months, and of clear benefit to someone outside the research lab—the systems described in the emerging technologies papers are on a clear track to deployment.

The 1999 conference papers addressed applications in many diverse areas, including education, the military, networking, space science, medicine, games, and the stock market. The AI techniques include planning, natural language processing, and diagnostic reasoning. However, for 1999, the mix was somewhat different and representative of a harbinger of new directions in AI applications and deployment. The mix included agent-based applications that operate in real time, real-time planning and scheduling applications, and personal assistant applications. We encourage you to look through all the papers in the IAAI-99 proceedings.

The following four articles are included in this issue. We hope that the applications presented in these articles give a flavor of how AI is enabling solutions to real-world problems.

Eero Hyvönen and Stefano De Pascale, "A New Basis for Spreadsheet Computing: INTERVAL SOLVER for Microsoft® EXCEL," describe an add-in that seamlessly upgrades the arithmetic core of EXCEL into interval constraint solving.

Geun-Sik Jo, Kang-Hee Lee, Hwi-Yoon Lee, and Sang-Ho Hyun, "Ramp Activity Expert System for Scheduling and Coordination at an Airport," describe a knowledge-based scheduling system that solves aircraft parking problems.

Andy Hon Wai Chun, Steve Ho Chuen Chan, Francis Ming Fai Tsang, and Dennis Wai Ming Yeung, "Stand-Allocation System: A Constraint-Based System Developed with Software Components," describe the development of another aircraft parking system but one that integrates multiple off-the-shelf software.

André Hübner, Mario Lenz, Roman Borch, and Michael Posthoff, "Last-Minute Travel Application," describe a case-based reasoning system that is an

integral part of a virtual travel agency to assist customers in choosing the best among a selection of tour packages sold as last-minute tours.

The IAAI conferences are intended to focus on serious applications that make a demonstrable difference to someone outside AI. The papers from IAAI-99 presented in this issue are exemplars of the many solid demonstrations that AI delivers real value. Successful applications of AI are part of, and buried in, larger systems that probably should carry the label AI inside.

The two invited talks included in this issue are "What Does the Future Hold?" presented at IAAI-99 by Howard Shrobe of the Massachusetts Institute of Technology, and "The Road Ahead for Knowledge Management," by Reid Smith of Schlumberger. We are grateful to Shrobe and Smith for agreeing to prepare extended versions of their IAAI-99 presentations for this issue.

In his article, Shrobe expounds on his belief that the war has been won on the question of whether AI makes a difference. He then poses some provocative questions on new challenges and new opportunities and sketches his vision of the applications we will see at IAAI in 2009. In their article, Smith and his coauthor Adam Farquhar develop a road map for knowledge management. Knowledge management activities center around enabling organizations to capture, share, and use the overall experience and know-how of their people and are perceived to be fundamental to competing in the knowledge economy. They assert that to make progress in this area, an ensemble of interwoven technology, process, people, and content must be addressed. They specifically focus on ways in which AI technology could be applied in knowledge management systems by developing a road map for it. Just like Shrobe, they also sketch the possible evolution of technology and practice over a 10-year period, a theme of IAAI-99.

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