Report on the Second International Joint Conference on Autonomous Agents and Multiagent Systems

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■ The Second International Joint Conference on Autonomous Agents and Multiagent Systems (AAMAS-03) was held in Melbourne, Australia, in July 2003. Attracting nearly 500 delegates, the event confirmed AAMAS as the academic main event for researchers with an interest in multiagent systems. We summarize the conference highlights and report on the associated workshops, tutorials, and emerging trends.

It seems hard to believe, but only a decade ago the field of autonomous agents and multiagent systems was a relatively junior partner in the AI business. Although a number of workshops had been held more or less regularly since 1980 (notably the U.S.-based Distributed Artificial Intelligence workshop series), until the mid-1990s, there was no dedicated archival venue for agent-related work. By 2000, the situation had changed dramatically; by then, there were two major conferences, a major international workshop, and a dedicated journal, all publishing work in the agents area. Although all these venues were doing good business (there was no shortage of submitted papers), the overheads involved in organizing three major events—not to mention the travel involved—suggested that there might be some value in consolidation. The

result was a single joint conference—the International Joint Conference on Autonomous Agents and Multiagent Systems (AAMAS). The inaugural conference was held in Bologna, Italy, in the summer of 2002, and the scale of the event took everyone involved by surprise. Nearly 550 papers were submitted to the main conference (with hundreds of others submitted to subsidiary workshops), and nearly 700 delegates attended. After an open call for bids to host the second conference, it was decided that AAMAS-03 should be held in Melbourne, Australia, with Lin Padgham (RMIT) and Liz Sonenberg (University of Melbourne) as local organizers.

Of course, 2003 did not turn out to be the easiest year in which to organize a conference. There are only four horsemen of the apocalypse, and in 2003, the world had a disturbingly close encounter with three of them: (1) war, (2) plague, and (3) (economic) pestilence. These events, combined with quite understandable ongoing concerns about global security and travel nervousness and a venue that, although undoubtedly attractive, was, nevertheless, relatively expensive to visit meant that there were grave concerns about the likely number of submissions. As it turned out, the conference received a very healthy 466 submissions from 30 countries across the globe. Some

24.7 percent of submitted papers were ultimately accepted from 19 countries. The accepted papers spanned the entire spectrum of research in autonomous agents and multiagent systems, from believable synthetic characters to computational game theory.

Although the numbers of submissions looked good, the global SARS outbreak in spring 2003 gave the organizers another quite unwelcome reason to lose sleep. At one point, in April 2003, a few discrete, whispered conversations were held about how one might go about canceling the conference if the worst happened and what the implications of such a cancellation might be. Of course, if the worst had happened, then the world would probably have rather more important things to worry about than a canceled conference. Mercifully, the SARS outbreak faded just as quickly as it had arrived, and by conference time, the number of registrations was looking better than any of the organizers believed possible, with 470 delegates ultimately registering.

The main conference was preceded by an extensive workshop and tutorial program, with 21 workshops and 10 tutorials. Again, workshops ranged across the entire spectrum of agent research and confirmed that for many delegates, the small but specialized events surrounding a conference are just as important as the main event itself.

The conference opened with a welcome reception and introduction by Joy Murphy, an elder of the aboriginal tribe that is the traditional owner of the land on which Melbourne, Australia, stands. Murphy was followed by the Honorable Marsha Thomson, the Victoria state minister for information and communication technologies, who tried very hard not to look at her notes whenever she had to say the phrase *autonomous agents and multiagent systems*. (Well, it doesn't exactly roll off the tongue, does it?) These welcomes were followed with a performance by One Fire, an aboriginal dance troupe.

It would be both difficult and perhaps unfair to draw attention to indi-

vidual papers from the technical program, so we confine our comments to some general trends that seem to be emerging. First, it seems clear that game theory continues to grow in importance as the theoretical underpinning to the agent field. As well as two sessions specifically devoted to game theory, the interest in game-theoretic foundations was also evident in the sessions on auctions and trading agents. After what seemed a rather muted showing in AAMAS-2002, the more traditional areas of multiagent systems, such as cooperation, coordination, multiagent planning, and teamwork seemed to be resurgent in 2003, with sessions on cooperation, teamwork, coalition formation, planning, groups and organizations, and coordination.

The semantic web began to make its presence felt in the conference, with sessions on ontologies, web agents, and web technologies. Given that many issues central to the semantic web vision—in particular, brokers and intelligent routers—are also central to (and well studied in) the multiagent systems world, it will be interesting to see how the two fields manage their common interests.

It was also interesting that although there were (of course) a number of sessions on communication between agents (for example, dialogue, semantics, and pragmatics of interaction), there was little direct work on agent communication languages such as FIPA and KQML. This might indicate that these technologies are now regarded as mature; certainly, the use of standard communication platforms such as JADE (the JAVA agent development environment) was common.

Three best paper prizes were awarded at the conference. Matthew Rosencrantz, Geoffrey Gordon, and Sebastian Thrun from Carnegie Mellon University were awarded best student paper for "Locating Moving Entities in Dynamic Indoor Environments with Teams of Mobile Robots." This award was particularly impressive because there was relatively little work on robotics overall at the conference. David Traum, Jeff Rickel, Jonathan Gratch, and Stacy Marsella (Universi-

ty of Southern California/Information Sciences Institute [USC/ISI]) won the best innovative system/application paper award for their paper "Negotiation over Tasks in Hybrid Human-Agent Teams for Simulation-Based Training." This paper showed how argumentation dialogues could be used to automatically allocate tasks in a military peacekeeping scenario (a sure sign of the times). The untimely death of Jeff Rickel, the second author of this paper, just days before the conference began meant that the celebrations accompanying this award were coupled with some sadness, and the thoughts and best wishes of the entire conference went out to Jeff's family, friends, and colleagues.

The overall best paper award went to Raphen Becker, Shlomo Zilberstein, Victor Lesser, and Claudia V. Goldman (University of Massachusetts) for their paper "Transition-Independent Decentralized Markov Decision Processes." This paper continues the trend of using Markov decision processes as a model of decision making that has become popular in mainstream AI recently and, in particular, of using decentralized Markov decision processes as a model for multiagent systems. It is also interesting that both of the best paper awards made by the AAMAS conference have gone to papers in this area (with the AAMAS-02 best paper going to David Pynadath and Milind Tambe from USC / ISI).

Although the conference officially finished on Friday, it is probably fair to say that the climax was on Thursday night, with the impressive conference dinner held in Melbourne's natural history museum. The dinner was accompanied by cabaret-style entertainment from Pot-Pourri, one of Australia's leading performance art troupes that entertained the revelers with a beguiling mixture of opera, comedy, and show tunes. Inevitably, the performance involved some conference-goers being pulled up on stage and forced to dance and sing, much to the amusement of those who were not so chosen.

Thus, despite concerns about global terrorism, war in Iraq, the SARS outbreak, a devastating economic

slowdown in the information technology industry, and the time and cost involved in traveling to Australia, the conference was a large, vibrant, and technically strong event. There is certainly no indication that the international interest in agent systems is receding, and there seems a plentiful supply of scientific and technical challenges that will keep the community going for the foreseeable future.

AAMAS-04 will be held in New York in July 2004.[1]

Note

1. Links to past and future AAMAS conferences are available online at www.aamas-conference.org/.

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