INTRODUCTION

Autonomous Agents and Multi-Agent Systems are, in the judgment of many observers, the most significant new paradigm for software modelling and development to emerge from Computer Science in the last two decades.

Autonomous Agents are computer programs that are able to decide between different methods of achieving their programmed goals. This is in contrast to the scripted, predefined behaviour that a traditional program, for example a Unix Daemon, would exhibit, and means that Autonomous Agents can cope with dynamic environments, can be developed as a quick solution to complex problems, and can tailor their behaviour to individual users in a way that traditional software cannot.

Multi-Agent Systems are computational environments in which different programs, possibly developed in isolation, can co-ordinate their behaviours to achieve their goals. The technology of Multi-Agent Systems is, therefore, particularly applicable to modern operational environments like e-business, ubiquitous computing, and, of course, the Internet.

These two topics of research are tightly coupled. For a Multi-Agent System to be fully implemented, it is often necessary to utilize the technology of Autonomous Agents. For an Agent to act with true autonomy in a realistic, modern setting, it must often be able to reason about other Agents and co-ordinate its behaviour with them. It is this insight that has led to the development of the AAMAS community and the spectacularly successful series of conferences that have been running for the last for years.

The AAMAS community has long recognised [Wooldridge & Jennings 1995] that the significance of the abstractions, techniques, tools, and technologies developed by the research community worldwide will only be recognised if they have practical applications in the real world of science, technology, education, healthcare, business, and commerce. The paradigm of AAMAS and available agent technologies has reached a significant level of maturity, and they are now widely regarded as ready for wider adoption. The purpose of the First Industry Track of the Autonomous Agent and Multi-Agent Systems conference is to provide a forum that will bring real world applications that are being developed by teams internationally to the attention of the AAMAS community and the wider world.

Why is this important? We have identified several motivations:

- By disseminating the news of successful application of AAMAS technology we hope to provide researchers with clear evidence of the success and usefulness of particular techniques.
- Feedback from attempts to use AAMAS technology is valuable in the formation of the AAMAS research agenda.
- A forum for discussion of industrial and application-orientated concerns has been lacking in the community to date; by providing one, we hope that practitioners will be able to share their experiences and, therefore, accelerate the uptake of AAMAS technology.
- Finally, we expect that, by providing an industry track, we will encourage more participation in AAMAS by practitioners, and that this will lead to a wider understanding of the importance of AAMAS technology in commercial organisations.

Fifteen papers that discuss the application of AAMAS technology are presented in this collection. They were selected by a refereeing process that aimed to find work that made use of the particular properties of AAMAS systems and had actually been used “in anger.” The ratio of submitted to accepted papers was higher than 2:1; that is, more papers were excluded from presentation than were accepted.

The papers that have been selected by the referees and programme committee for the track allow the identification of some trends in the development and application of AAMAS technology. Four out of fifteen papers are in the field of transport, traffic, and logistics. Natural problem decomposition, geographical distribution, and requirements for autonomous decision making make this domain particularly suitable for AAMAS technology.

A further four papers are focused on Aerospace applications. In this domain, the technological adventurousness of a highly competitive and demanding industry may explain the work presented. However, the use of AAMAS technology to provide autonomy for systems that cannot be easily or cheaply supervised by human intervention seems to be another clear driver.

Three papers focus on using AAMAS technology for manufacturing applications. Here, the drivers seem to have been to use Agent Autonomy or co-ordination techniques to provide cost savings, realised by removing large numbers of repetitive management and control tasks.

The track also features papers which describe the use of AAMAS technology for electricity network management and to provide a training system for naval personnel. Both of these papers point to cost savings realised by automating decision making processes.

Just as we can see trends in the papers that have been selected for publication, it’s also interesting to point to missing areas. There are no papers from promising domains for AAMAS adoption including telecommunications, internet, pharmaceuticals, eGovernment, or healthcare. Similarl,y the submission rate from small companies and start-ups was expected to be somewhat higher. These are areas that have been explored extensively in the past [Luck et-al 2003] so it is important for the AAMAS community to investigate why the research that has been performed has not matured into published case studies at this time.

Although the collection is diverse, all the papers share two common traits. Every paper is the result of the efforts of a team that has been prepared to take the risk of adopting a new technology in a high pressure environment, and every paper summarises what happens when talented people take a risk and that risk pays off. We salute all these pioneers, and look forward to the presentation of the technical program and the discussions that are bound to result.

Acknowledgments

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