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Preface

This volume presents revised versions of the papers presented at the 4th International Workshop on Multi-agent Based Simulation (MABS 2003), a workshop federated with the 2nd International Joint Conference on Autonomous Agents and Multi-agent Systems (AAMAS 2003), which was held in Melbourne, Australia, in July 2003. In addition to the papers presented at the workshop, three additional papers have been included in this volume (Robertson, Noto et al., and Marietto et al.).

Multiagent Based Simulation (MABS) is a vibrant interdisciplinary area which brings together researchers active within the agent-based social simulation community (ABSS) and the multiagent systems community (MAS). These two communities have different, indeed somewhat divergent, goals. The focus of ABSS is on simulating and synthesizing social behaviors in order to understand observed social systems (human, animal and even electronic) via the development and testing of new models and concepts. MAS focuses instead on the solution of hard engineering problems related to the construction, deployment and efficient operation of multiagent-based systems.

Increasingly however – and this was evidenced at AAMAS 2002 – the MAS and ABSS communities have much to learn from each other. Real human societies are generally self-organizing, highly scalable, robust and open, and the ABSS community has developed a sizable set of techniques, observations and models that give insight into some of the mechanisms that underpin these kinds of systems. However, ABSS has not concerned itself with applying these techniques to solve engineering problems. Conversely, the MAS community is concerned with creating working agent systems that solve real problems. This focus has forced many to abandon experimentation with large-scale systems (thousands of agents) composed of smart autonomous agents (e.g., complex adaptive learners) due to the lack of traditional techniques (and/or computational resources) for managing such complexity.

This difference of emphasis often precludes dialogue between ABSS and MAS researchers and practitioners, but MABS workshops have a track record of providing a major forum for such dialogue to occur. The work presented in various sections of the AAMAS 2002 main conference demonstrated a keen interest in the use of learning and adaptation combined with large-scale agent societies — increasingly, sociological issues such as cooperation, trust and power hierarchies are being broached from the engineering perspective. In light of this, the 2003 MABS workshop returned to its original aim, asking researchers from each community to identify problems and challenges for those in the other community.

The MABS workshop offers a potential linkage (shared vocabulary and methodology) between social scientists and MAS researchers, and at MABS 2003 we attempted to focus on the development of this linkage. To this end, Giovanna Di Marzo Serugendo was invited to open the proceedings with a presentation of her work on utilizing self-organization to produce solutions to software engineering problems. A paper based on this talk can be found in this volume. MABS 2003 was the fourth workshop in the MABS series. The first two were organized as federated workshops of ICMAS 1998 and ICMAS

2000. The third MABS workshop was federated with AAMAS 2002 (which subsumed the ICMAS series). The first MABS workshop, held in Paris at ICMAS 1998, had as its aim "to develop stronger links between those working in the social sciences, for whom agent based simulation has the potential to be valuable research tool, and those involved with multi-agent simulation, for whom the social sciences can provide useful concepts and exemplars". The proceedings were published by Springer in LNAI 1534, in a volume called *Multi-Agent Systems and Agent-Based Simulation*. The second MABS workshop, held in Boston at ICMAS 2000, extended this development, and provided substantial discussions. The presentations focused on lessons of social simulation for DAI, on the supporting and reporting of social simulation modeling and on social simulation-based software applications. These were published by Springer-Verlag in LNAI 1979, in a volume called *Multi-Agent-Based Simulation*. The third MABS workshop, held in Bologna at AAMAS 2002, continued the aim of developing and supporting links between social science and Multi-Agent Systems practitioners via the medium of multiagent-based simulation. Additionally, the workshop echoed a specific AAMAS 2002 topic: "interactions between people and agent technology." The workshop proceedings were published by Springer-Verlag in LNAI 2581, called *Multi-Agent-Based Simulation II*.

This fourth MABS workshop continued the tradition of high-quality presentations, discussion and debate coupled with a multidisciplinary approach, and we thank all those who made it possible, including the AAMAS general and local organizers who ran an incredibly professional conference and provided us with excellent workshop facilities.

Finally, we must also thank Alfred Hofmann and the Springer team for again supporting the dissemination of this latest installment of the MABS series.

Manchester, September 2003

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