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Engineering Societies in the Agents World V

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Preface

The first workshop “Engineering Societies in the Agents World” (ESAW) was held in August 2000, in conjunction with the 14th European Conference on Artificial Intelligence (ECAI 2000) in Berlin. It was launched by a group of researchers who thought that the design and development of MASs (multi-agent systems) not only needed adequate theoretical foundations but also a call for new techniques, methodologies and infrastructures to develop MASs as artificial societies. The second ESAW was co-located with the European Agent Summer School (ACAI 2001) in Prague, and mostly focused on logics and languages, middleware, infrastructures and applications. In Madrid, the third ESAW concentrated on models and methodologies and took place with the “Cooperative Information Agents” workshop (CIA 2002). The fourth ESAW in London was the first one that ran as a stand-alone event: apart from the usual works on methodologies and models, it also stressed the issues of applications and multidisciplinary models. Based on the success of previous ESAWs, and also given that the difficult challenges in the construction of artificial societies are not yet fully addressed, the fifth ESAW workshop was organized in the same spirit as its predecessors.

In particular, ESAW 2004 took place at the IRIT laboratory of the Université “Paul Sabatier” (Toulouse, France), at the end of October 2004. It was not co-located with any other scientific event, in the same way as ESAW 2003. ESAW 2004 remained committed to the use of the notion of MASs as the seeds for animated, constructive and highly interdisciplinary discussions about technologies, methodologies and tools for the engineering of complex distributed systems. The widespread interest in these topics, as well as the effectiveness of ESAW as a well-established research forum, are witnessed by both the high number of submissions received (46 papers from 20 countries) and by the good participation (46 researchers from 14 countries).

This fifth workshop mainly focused on effective and methodical development of complex software systems in terms of multi-agent societies, as well as on novel approaches to software modelling and engineering to support the successful deployment of software systems made up of massive numbers of autonomous components. While designers should be enabled to control and predict the behavior of their systems, we should also allow emergent global system properties and discovered functionality to become commonplace in the theory and practice of MASs. It is very likely that such innovations will exploit lessons from a variety of different scientific disciplines, such as sociology, economics, organization science, modern thermodynamics, and biology. This is the main reason why the presentations in this workshop covered a number of these domains.

The following different themes were addressed during the three-day meeting:

- *Agent-Oriented Software Engineering*. The presentations of this session concerned methodologies, and discussed requirements analysis, specification, design and deployment phases.
- *Negotiation*. This session covered different mechanisms to enable agents to negotiate and to solve conflicts. The different mechanisms presented were based on biological metaphors, social welfare, and Activity Theory.
- *Large-Scale Multi-agent Systems*. The papers of this session focused on communication in large systems, semantics, and physical accessibility.
- *Roles*. Presentations in this session concentrated on the notion of role in a MAS: in particular, on the notion of role as used in the context of the argumentation process, and during conversation protocols.
- *Organizations*. This is one of the main topics in societies of agents, and was discussed in the context of a normative framework and of virtual knowledge communities.
- *Social Aspects*. This session drew a parallel between human and artificial societies by studying on the one hand the social power theory and on the other hand the role of sanctions in a society.
- *Simulation*. This session elaborated on the issues of simulation by using MASs, focusing on challenges such as the development process and the calibration of parameters in a simulation system.
- *Cooperation*. This session covered one of the most traditional topics in MAS research, that is, cooperation.

Two invited presentations tried to bridge between artificial and natural societies, such as human or animal societies. The first invited talk was given by Vincent Chevrier, who is an assistant professor at the Université Henri Poincaré of Nancy (France) and a researcher at LORIA in the MAIA team. He proposed methodological principles for the design of MASs drawing from the mechanisms observed in natural systems such as stigmergy or resource access.

Pablo Noriega expounded the other invited presentation concerning e-institutions. He is a senior researcher at Anáhuac University, Mexico City (Mexico), as well as a visiting researcher at the Institut d’Investigació en Intelligència Artificial (IIIA) in Barcelona (Spain). He elaborated on how interaction conventions for agents — human or software agents — can be used to engineer complex open systems by using commitments.

Furthermore, discussions during the meeting emphasized the need for tools to design large-scale systems and open systems. From the debate, two main acceptations of the term “openness” clearly emerged: a MAS is open either when agents can be dynamically added or removed, or when the MAS can take into account the perturbations coming from the MAS environment.

The original contributions, the slides of the presentations, as well as more information about the workshop are available online at the ESAW 2004 website (<http://www.irit.fr/ESAW04>). This postproceedings (ESAW 2004: LNAI 3451) continues the series published by Springer (ESAW 2000: LNAI 1972, ESAW 2001: LNAI 2203, ESAW 2002: LNAI 2577, and ESAW 2003: LNAI 3071).

This volume contains revised, reworked and extended versions of selected papers from ESAW 2004, and also includes the contribution of one of the two invited speakers.

The ESAW 2004 organization would have not been possible without the financial help of:

- Agentlink III
- ARTAL Technologies, Labège, France
- ILOG, Paris, France
- IRIT, Toulouse, France
- Université Paul Sabatier, Toulouse, France
- Whitestein, Switzerland

as well as the scientific support of the Alma Mater Studiorum, Università di Bologna in Cesena, the Università di Modena e Reggio Emilia, and all the members of the Program Committee. Our thanks also go to Alfred Hofmann and all of his Springer crew for their essential role during the realization of the postproceedings. We also want to thank the local organizers who created a studious and convivial ambiance during the workshop.

The next ESAW workshop will take place in Turkey supported by the Ege University of Izmir during the fall of 2005, with Oguz Dikenelli, Marie-Pierre Gleizes and Alessandro Ricci as the chairs and organizers. We expect that the next ESAW workshop will keep up its tradition of innovation and stimulating scientific debate, and also that more applications and demonstrations of running systems will further prove the feasibility and usefulness of the mechanisms and methods recommended by agent researchers.

February 2005

Marie-Pierre Gleizes
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