

# The Second AgentLink III Technical Forum: Main Issues and Hot Topics in European Agent Research

## 1 Introduction

Together, this and the next issue of *Informatica* present a collection of articles on the edge of agent research in Europe. The papers in this double special issue arise from scientific exchanges and debates that took place at the Second AgentLink III Technical Forum (AL3-TF2) hosted by the Jozef Stefan Institute in Ljubljana, Slovenia, from February 28 to March 2, 2005.

AgentLink III is a European Commission (EC)-sponsored Coordination Action (Project number: IST-FP6-002006CA) to support research and development in agent-based technologies and to strengthen Europe's efforts in this domain. This two-year project (2004-2005) is funded through the Semantic-based Knowledge Systems area of the Information Society Technologies (IST) Thematic Priority of the Sixth Framework Programme (FP6). AgentLink III follows the Thematic Networks AgentLink (1998-2001) and AgentLink II (2001-2003) of the Fifth Framework Programme. Its Management Committee comprises academic and industrial representatives from across the European agent technology community. To support this leadership, the project established in early 2004 a system of membership by which institutions active in agent research or development could apply to join the project. By 31 August 2005, 192 organisations from 21 European and associated states had become members of AgentLink III, out of which there were 125 Universities, 30 Research Institutes and 37 private companies. This high level of membership indicates the considerable support for the project from European organisations, both public and private.

## 2 AgentLink III Objectives

The long-term goal of AgentLink III is to put Europe at the leading edge of international competitiveness in the increasingly-important area of agent technologies. To realise this goal, AgentLink III has sought to achieve the following objectives:

- To gain competitive advantage for European industry by promoting and raising awareness of agent systems technology.
- To support standardisation of agent technologies and promote interoperability.
- To facilitate improvement in the quality, profile, and industrial relevance of European research in the area of agent-based computer systems, and draw in relevant prior work from related areas and disciplines.
- To support student integration into the agent community and to promote excellence in teaching in the area

of agent-based systems.

- To provide a widely known, high-quality European forum in which current issues, problems, and solutions in the research, development and deployment of agent-based computer systems may be debated, discussed and resolved.
- To identify areas of critical importance in agent technology for the broader IST community, and to focus work in agent systems and deployment in these areas.

Further information about AgentLink III and its many activities is available from the AgentLink website at <http://www.agentlink.org>.

## 3 AgentLink III Technical Fora

In order to support co-ordination and collaboration of European research efforts, AgentLink III established a series of research meetings, called the AgentLink III Technical Fora (TFs). These comprise a number of parallel workshops, called Technical Forum Group (TFG) meetings, on topics suggested in response to a call for proposals issued before each Technical Forum. Soliciting topics for TFGs in this way ensures that the meetings retain flexibility, and can reflect whatever is the current focus of research attention in the agents community. This feature also implies that the standard for acceptance can be quite high, with proposers needing to show evidence of research co-ordination activities before, during, and after each Technical Forum. Examples of such activities include the establishment of persisting web-sites and discussion forums, the production of short and long reports of the activities at the event, integration of related activities, and development of joint survey papers of the respective research area.

Three Technical Fora were organised under AgentLink III:

- TF1: Rome, Italy: 30 June–2 July 2004.
- TF2: Ljubljana, Slovenia: 28 February–2 March 2005.
- TF3: Budapest, Hungary: 15–17 September 2005.

Over a hundred participants have registered for each TF meeting, with attendance not only from European and neighbouring countries, but also Australia, Japan, and the USA.

Each Technical Forum supported between six and nine TF Groups, with most of them meeting for a whole day, and often mixing with other groups in planned, but also spontaneously arranged joint meetings on research topics of common interest. Given that AgentLink seeks to reach out and establish links with related research disciplines and with other research projects, special efforts have been aimed at

encouraging the formation of TF Groups which make connections between the agents community and other communities. For instance, there have been TF Groups which have looked at the intersection of agent technologies and the law; biology and bio-informatics; and economics. In addition, joint TF Groups have been held with two related EC-funded projects, *KnowledgeWeb*<sup>1</sup> and *ASPIC*<sup>2</sup>.

Further information about AgentLink III Technical Fora and their articulation is available from the AgentLink website at <http://www.agentlink.org/activities/al3-tf/>.

## 4 Main Issues and Hot Topics in European Agent Research

The double special issue of *Informatica* comprises reviewed invited and selected articles from the TFG meetings held at the Second AgentLink III Technical Forum (AL3-TF2). The aim of this collection is to provide a deep and coherent overview of the main issues and the hottest topics in European research on agent technologies, as they emerged from the work of the AgentLink III TFGs.

To this end, the TFG Chairs were asked to produce first of all a survey of the main issues as they arose in the work and scientific debate at their TFG meetings, and then possibly to invite some of the most prominent participants to illustrate the hottest topics in their specific field of discussion. Both the surveys and the “hot topics” articles were then scrutinised and carefully reviewed by several European experts, who helped the Guest Editors to select the best papers among the many submitted, and thereby contributed significantly to the improvement of the accepted papers. As a result, five surveys from among the most active TFGs were selected for these Special Issues, with the aim of giving a general overview of the current activities and challenges in a number of key areas of agent technologies, and also of revealing the breadth and sophistication of current research and development in Europe. In addition, seven other “hot topic” papers from four of these TFGs were also included, to provide readers of *Informatica* with in-depth insights in some of the most controversial and potentially fertile sub-areas in the agent field.

The contributions collected in the first number of the special issue document work in the TFGs on Agent-Oriented Software Engineering (TFG-AOSE) and Environments for Multiagent Systems (TFG-ENV), and are described briefly in the following. The articles in the second number of the double special issue (30(1)) were provided by the TFGs on Multiagent Resource Allocation (TFG-MARA), Programming Multi-Agent Systems (TFG-PROMAS), and Self-Organisation in MAS (TFG-SELFORG).

### Agent-Oriented Software Engineering (TFG-AOSE) *An Overview of Current Trends in European AOSE*

<sup>1</sup>See <http://knowledgeweb.semanticweb.org/>.

<sup>2</sup>See <http://www.argumentation.org/>.

*Research*, by Carole Bernon, Massimo Cossentino, and Juan Pavón, provides an “aerial” perspective on current research trends in Agent-Oriented Software Engineering (AOSE), with a specific attention to the results coming from European research groups.

*Agent Modeling Language (AML): A Comprehensive Approach to Modeling MAS*, by Ivan Trencansky and Radovan Cervenka, focuses on a semi-formal visual modelling language for specifying, modelling, and documenting systems that incorporate agent features.

*The Tropos Metamodel and its Use*, by Angelo Susi, Anna Perini, John Mylopoulos, and Paolo Giorgini, illustrates the Tropos metamodel from the basic concepts of actor, goal, plan, resource, and social dependency, and discusses its use through an extension toward security.

### Environments for Multiagent Systems (TFG-ENV)

*On the Role of Environments in Multiagent Systems*, by Danny Weyns and Tom Holvoet, surveys MAS research on the long overlooked issue of the role and ontological status of the environment of MAS, and presents a model for MASs that alongside agents puts forward the environment as first-order abstraction.

*Towards a Unified View of the Environment(s) within Multi-Agent Systems*, by Abdelkader Gouaïch and Fabien Michel, challenges the single-environment hypothesis by allowing for multiple occurrences of the agent-environment relationship within individual MAS.

*Coordination Artifacts: A Unifying Abstraction for Engineering Environment-Mediated Coordination in MAS*, by Alessandro Ricci and Mirko Viroli, proposes the notion of coordination artifact as a unifying abstraction for engineering environment-based coordination of agents.

## Acknowledgements

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We hope you will enjoy this—and look forward to the second!—part of the double special issue.

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