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The AgentLink III Technical Forums: Introduction to the Special Issue

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Abstract

This paper introduces the Special Issue of *The Knowledge Engineering Review* devoted to reports arising from selected Technical Forum Groups at the First and Second AgentLink III Agent Technical Forums, held in 2004 and 2005.

1 Introduction

This issue of *Knowledge Engineering Review* comprises a Special Issue devoted to selected reports from the AgentLink III Agent Technical Forums. AgentLink III is a European Commission (EC)-sponsored project to support research and development in agent-based technologies and to strengthen Europe's efforts in this domain. It is funded under the Information Society Technologies (IST) Activity Area of the Sixth Framework Programme (FP6), through the Semantic-based Knowledge Systems area (Project number IST-FP6–002006CA). AgentLink III follows two earlier EC-funded projects, AgentLink (1998–2001) and AgentLink II (2001–2003), both of which were Networks of Excellence in the terminology of the Fifth Framework Programme. AgentLink III is a Co-ordination Action, led by the University of Liverpool and the University of Southampton, UK, under the direction of a Management Committee comprising 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 organizations from 21 European and associated states had become members of AgentLink III, of which 125 were universities, 30 were research institutes and 37 were private companies. This high level of membership indicates considerable support for the project from European organizations, 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 realize 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 standardization 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.

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- 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 on 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 Forums

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 Forums (TFs). Each of these meetings comprise a number of parallel workshops, called Technical Forum Groups (TFGs), on topics suggested in response to a call for proposals issued before each Technical Forum meeting. 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 has also meant 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 TF. Examples of such activities include the establishment of Web sites and discussion forums, the production of short and long reports of the activities of the event, surveys of activities, and development of collective survey papers of the fields covered by the groups.

Three TF events have been held 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.

Approximately 110 participants have registered to attend each TF meeting, with participants coming from Australia, Japan and the USA, in addition to participants from European and neighboring countries.

Each TF meeting supported between six and nine TFGs, with most groups meeting for a whole day, and often mixing with other groups in joint meetings on research topics of common interest. Because AgentLink seeks to build links with related research disciplines and with other research projects, special efforts have been given to encouraging the formation of TFGs which make connections between the agent's community and other communities. For instance, there have been TFGs which have looked at the intersection of agent technologies and the law; biology and bioinformatics; and economics. In addition, joint TFGs have been held with two related EC-funded projects, *KnowledgeWeb*[1] and *ASPIC*[2].

4 TFGreports

This Special Issue comprises selected and carefully reviewed long reports from seven of the TFGs held at the First and Second AgentLink III TF meetings. The reports provide snapshots of current activities and challenges in a number of key areas of agent technologies, and reveal the breadth and sophistication of current research and development. The seven reports are as follows.

[1] See `http://knowledgeweb.semanticweb.org/`
[2] See `http://www.argumentation.org/`

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- *Agent-oriented software engineering* (TFG-AOSE), by Carole Bernon, Massimo Cossentino, and Juan Pavón.
  This article sketches the main aims of the AOSE TFG, and reports on the activities held at the TF1 and TF2 meetings. In particular, the paper faces the issue of interoperability among the plethora of already available agent-oriented methodologies, analyzes and compares meta-modelling frameworks, and finally illustrates a possible meta-model resulting from the TFG discussions.
- *Agents in bioinformatics* (TFG-BIO), by Emanuela Merelli and Michael Luck. The BIO meeting, held at TF1, aimed at fostering cooperation between the agent and bioinformatics communities. In the report, the TFG chairs expose the many different perspectives on the field as they emerged from the discussions, and provide the reader with a wide and stimulating perspective over the possible cross-fertilization between agent and biological models, systems and technologies.
- *Environment for multiagent systems* (TFG-ENV), by Danny Weyns, Michael Schumacher, Alessandro Ricci, Mirko Viroli, and Tom Holvoet. This paper elaborates on the results of the meetings held at TF1 and TF2, and puts forward the environment as a first-order abstraction in multiagent systems. Related literature and scientific models are carefully reported and organized, showing the growing awareness in agent research of the prominent role of the environment in multiagent systems.
- *Multiagent resource allocation* (TFG-MARA), by Yann Chevaleyre, Paul E. Dunne, Ulle Endriss, Jérôme Lang, Nicolas Maudet and Juan A. Rodríguez-Aguilar. This paper reports on the first MARA meeting held at TF2 which considered methods for resource allocation in multi-agent systems. The paper reports on the work presented at that meeting and outlines some of the research challenges in this field. Resource allocation in agent systems draws on research in economic theory and in social choice theory, a branch of political science, while adding a computational perspective to these disciplines.
- *Programming Multi-Agent Systems* (TFG-PROMAS), by Mehdi Dastani and Jorge J. Gomez-Sanz. In this paper, the chairs of PROMAS provide the readers with an overview of the main contributions and conclusions derived from both the meetings held at TF1 and TF2. After a general overview of the main issue in the agent field, the paper faces the issues of programming languages for multiagent systems, and also of the development tools required to ease the task of agent programmers and to enable the engineering of large-scale agent-based systems.
- *Self-Organization in MAS* (TFG-SELFORG), by Giovanna Di Marzo Serugendo, Marie-Pierre Gleizes, and Anthony Karageorgos. This article reports on the activity of the SELFORG TFG at TF1 and TF2, and elaborates on issues of self-organization and emergence in MASs. After proposing a common definition for both self-organization and emergence, as well as for the associated properties and characteristics, the paper focuses on the selection of self-organization mechanisms, and discusses them in a number of case studies.
- *Towards Semantic Web agents: Knowledge Web and AgentLink* (TFG-SWA), by Terry Payne and Valentina Tamma. This paper first argues that agents are essential components of the Semantic Web, then includes a short history of how the Semantic Web vision—that includes agents—has evolved in the last fifteen years. Against this conceptual background, the paper frames and illustrates the topics presented and discussed during the SWA meeting at TF2.

Finally, we wish to thank all those who have made the AgentLink III TFs the success they have been, especially the AgentLink III staff: Catherine Atherton, Becky Earl, Adele Maggs and Serena Raffin. We also thank the AgentLink III Management Committee for their support, and the local organizers and their staff at each event: Rino Falcone at TF1, Matjaz Gams at TF2 and László Z. Varga at TF3. We also thank Cristiano Castelfranchi (TF1) and Paolo Petta (TF2–TF3) who, along with us, have chaired the TF Committees these last two years.

We hope you enjoy reading this Special Issue.

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