

THE INTELLIGENT INFORMATION AGENTS (I2A) SPECIAL INTEREST GROUP MEETING, AMSTERDAM

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The seventh meeting of the I2A SIG was held on December 5, 2001, at the Free University of Amsterdam, The Netherlands. It was co-located with the meeting of the EU-IST funded thematic network OntoWeb. The purpose of the I2A SIG meeting was three-fold;

1. Update of latest results of research and development of SIG members in the European I2A domain.
2. Synchronisation between activities of SIG members and agreement on new roadmaps of SIG's working groups.
3. Foster relationships to and proceed with joint work in collaboration with our partners in academia, industry and standardisation organisations.

All working groups (C3, ADK, and AIA) of the SIG attended the meeting with an average of 15 participants.

Presentations

The meeting started off with invited plenary talks given by members of each of the working groups. Ramon Sanguesa (UPC, Spain) gave insights on project-related work on the application of reputation methods in a multi-agent system for human management support. Simon Thompson (BT, UK) provided a survey of agent technologies deployed to the domain of workflow management. In his talk, he pointed out in particular the difficulties of integrating new technology into existing procedures and the danger of mismatch between specific over-sophistication of the technology provided (e.g. in terms of representational capabilities) and the actual needs of the real problem at hand. Using the history of technologies developed by BT, spanning from ADEPT in the mid-1990 to the current AgentCities initiative, he illustrated progress in tackling these extant issues. Michael Schroeder (City Uni London, UK) traced the historical roots of Grid Computing, emphasising how in his view Grid Computing is "parallel distributed computing" under modern guise. He pointed out where and which issues also discussed within the agent community surface in this context. The presentation of the underlying technologies was illustrated with some current biomedical application scenarios. Marie-Christine Rousset (Uni Paris-Sud, France) presented ongoing work on the information system Xyleme, in particular its promising, formal tree-based approach to intelligent information integration. Gerd Beuster (Uni Koblenz-Landau, Germany) gave an inspiring talk on the status of the MIA project on information agents für mobile, location-aware computing (http://www.uni-koblenz.de/~bthomas/MIA_HTML/).

The afternoon consists of a sequence of plenary talks and discussions on each of the working group's activities and current joint research projects. In particular, in the context of the ADK working group, Davide Gazotti (Gruppo Formula Spa, Italy) outlined the ongoing and future work of the EU-funded WINK project on Web-linked integration of networked-based knowledge. This project is led by the Uni Modena, Italy, as part of the recently started EUTIST-AMI cluster. The objective of the WINK project is to validate a combination of two promising software platforms which will perform automated, efficient data collection and

project management in complex smart organisations made up of physically and organisationally remote partners participating in large-scale projects. WINK will support project networks by integrating, adapting and implementing the technologies developed in the distinct WHALES and MIKS projects, focused respectively on project networks management and intelligent agents middleware. The WINK project will allow to install and test the software in a real business setting provided by the Italian leader space industry Alenia Spazio, focusing on procurement, co-design, project status and part availability in network of four other partners spread across Europe, and apply a factual cost benefit analysis on the system experiment. Then, WINK will be one step from becoming a commercial product.

In the C3 working group's session, Andrea Omicini (Uni Bologna, Italy) illustrated the multitude of possible perspectives on the relationship between the notions of context(s) as defined and treated and the domain of C3. A range of ensuing topics and issues was presented, culminating in the provocative question of whether context-oriented programming be seen to be the Agent-oriented counterpart to aspect oriented programming. It was proposed that (*agent*) *context* can serve as a viable abstraction for agent environment, and start discussing the main issues relating context to agent interaction, communication and coordination, such as situatedness, openness, security, topology, economy, embodiment and prescriptiveness.

Enrico Blanzieri (ITC-IRST, Italy) illustrated how communication, coordination and control can benefit from taking a multicontext perspective and using multi-contexts formalisms. He explained how multicontexts allow to model the relativism of local/individual views, thereby picking up and continuing the thread followed by Andrea Omicini and Sascha Ossowski in their presentation on Objective vs. Subjective Coordination given at the previous session of the C3 WG at the AgentLink2 meeting in Prague in the past July. Blanzieri noted how this approach is only partially new and presented a brief schema of the pros and cons. According to this approach, actions serve as primitives in the definition of communication as shared plans; coordination relates to sharing of semantics (including the special case of imitation as a basic means to attempt to import semantics into the individual point of view); and the notion of control relates to the capability of prescribing semantics, with "implicit culture" as a particular case where the coverage of the prescription is not (needs not) be located with any particular agent.

In the last session of this SIG meeting, Maarten van Someren (Uni Amsterdam, Netherlands) sketched ideas and approaches to solve selected problems in the domain of multi-agent version space learning by relevance sharing. Rushed Kanawati (LIPN Uni Paris 13, France) provided an interesting case-based reasoning approach for automatic Web site personalisation which has been developed in the context of the system COBRA.

Finally, Matthias Klusch (DFKI) gave a brief summary on recent activities in the European research community which are relevant to the SIG, including the EU-funded projects Agentcities.RTD and Agentcities.NET, and the EUTIST-AMI cluster.

Achievements of the I2A SIG During Second Half-Year 2001

Since there are no further EU-funded SIG meetings planned for the year 2002, all SIG members are encouraged to continue with agreed joint activities in the meantime as good as it gets. Therefore, I take this opportunity to briefly summarise the significant achievements of each of the SIG's working groups in the past period from June until December 2001.

ADK Working Group on Agent-Based Data and Knowledge Management

- **Members:**
Academic: 28,
e.g., University of Modena and Reggio Emilia, Italy; University of Karlsruhe, Germany;
University of Rome La Sapienza, Italy; Vrije Universiteit Amsterdam, Netherlands
Industrial: 7
Siemens AG, Germany; Gruppo Formula S.p.a, Italy; CK Limited UK; HP Labs, UK
DFKI, Germany
- **Goals Pursued:**
Increase the number of participants, especially extending towards the area of database and information system researchers. As mentioned in the last meeting report the group severely suffered from a decrease of members due to the activation of the ONTOWEB thematic network of which the group was the main and initial core. Issuing a strict collaboration with ONTOWEB members.
- **Publications:**
 - S. Bergamaschi, G. Cabri, F. Guerra, L. Leonardi, M. Vincini, F. Zambonelli: "Supporting Information Integration With Autonomous Agents", Fifth International Workshop CIA-2001 on COOPERATIVE INFORMATION AGENTS September 6 - 8, 2001, Modena, Italy (CIA-2001)
 - G. Gelati, F. Guerra, M. Vincini: "Agents supporting information integration: the MIKS framework", WOA-2001 Workshop on Objects and Agents, Italy, Sept 2001.
- **Organisation of Events:**
 - 5th International Workshop on Cooperative Information Agents (CIA-2001), Modena, Italy, September 2001; General chair: M Klusch
- **Projects:**
2 EU-funded projects related to agent-based systems are jointly performed by WG members; both projects are led by the University of Modena e Reggio Emilia (Unimo):
 - 1) WINK which involves Alenia Space, Gruppo Formula and Unimo
 - 2) SEWASIE which involves CNA, Unimo, University of Manchester and Roma La Sapienza
- **Presentations:**
S Bergamaschi, Invited talk at ONTOWEB meeting, 6/12/2001, Amsterdam
S Bergamaschi, at Università della Calabria, 11/12/2001

C3 Working Group on Communication Coordination and Cooperation

- **Members:**
Academic: 14,
e.g., University of Modena and Reggio Emilia, Italy; Blekinge Institute of Technology (BIT), Sverige,
Universidad Rey Juan Carlos, Spain,
Industrial: 6
Siemens AG, Germany; HP Labs, UK, DFKI, Germany, ITC-IRST, Italy, DaimlerChrysler, Germany
- **Goals Pursued:**
Instigate interdisciplinary contacts within research, foster collaboration of academia and industry, support further research in topical areas. We refer to the technical roadmap for details.
- **Publications:**
Over a dozen contributions to different conferences and journal papers. Examples include
 - Special issue of the Knowledge Engineering Review on Coordination and Knowledge Engineering (editors: Andrea Omicini and Sascha Ossowski) to appear in 2002
 - Post-Proceedings of ESAW'01, Engineering Societies in the Agents World, Omicini A., Petta P., Tolksdorf R. (eds), Springer-Verlag, Lecture Notes in Computer Science 2203, 2001.

- **Organisation of Events:**
 - 2nd international Workshop on Engineering Societies in the Agent's World (ESAW'01), Prague, Czech Republic, July 7, 2001, Chairs: Andrea Omicini, Robert Tolksdorf, Paolo Petta.
 - Preparation of AT2AI-3 (From Agent Theory to Agent Implementation) at EMCSR, Vienna, 2002, Chair: Paolo Petta
 - Preparation of ESAW'02, Spain 2002, Chairs: Paolo Petta, Robert Tolksdorf, Franco Zambonelli
 - Coordination Track of the ACM Conference on Applied Computing (SAC'2002), chairs: Andrea Omicini and Sascha Ossowski

- **Projects and Collaborations:**

The Working Group was remarkably successful in establishing fruitful contacts, with the additional support provided by platforms such as the organised conferences. In addition to joint work for the publications and conferences mentioned above, further examples include:

 - A two-month visit of Martin Fredriksson from BTH Sweden at DEIS for completion of his Ph.D. work under the joint supervision of Andrea Omicini and Rune Gustavsson.
 - Collaboration of DEIS Bologna, Italy and BTH Sweden in the Vinnova project (coordination: Rune Gustavsson).
 - Collaboration between SIEMENS Munich and BTH Sweden under the supervision of Bernhard Bauer and Rune Gustavsson;
 - Participation in the AgentCities.Net (e.g.: Universidad Rey Juan Carlos, Spain/S Ossowski).
 - Collaboration between University of Toulouse and the Norwegian University of Science and Technology, Trondheim, Norway, for joint research work. The WG members have published one common research paper in a book recently published by Springer and intend to apply for a French/Norwegian project called AURORA on "agent technology for inter-organizational workflow" as a result of this collaboration.

AIA Working Group on Adaptive Information Agents

- **Members:**

Total: 11
 Academic: 7, e.g., University of Aberdeen; Universita di Torino; Universitat Poltecnica de Catalunya
 Industrial: 4
 Hewlett-Packard Labs; Sharp European Research Labs; NCR (Retail & Financial Division);
 Changing Worlds Ltd.

- **Goals Pursued:**

Increase WG membership;
 Develop links with other communities (EUNITE, ILPNet, KDNet);
 Explore creation of a new inter-network SIG on "Agents that Learn, Adapt & Discover";
 Explore opportunities for collaboration/contact between WG members outside of formal AL-II sponsored WG meetings.

- **Publications:**

Individual WG members have produced publications during the period. Selected examples which illustrate activities of WG members include

 - L. Ardissono et al, "Software architecture of SETA, an adaptive Web store shell", Proc. 5th Int. Conf. on Autonomous Agents (Agents '01), ACM Press, June 2001.
 - L. Ardissono, A. Goy, G. Petrone, M. Segnan, "A software architecture for dynamically generated adaptive Web stores", Proc. 17th International Joint Conference on Artificial Intelligence (IJCAI'01), Seattle, August 2001.
 - McGinty, L. and Smyth, B. (2001) Collaborative Case Based Reasoning: Applications in Personalised Route Planning. In Proceedings of the 4th. International Conference on Case-Based Reasoning, (ICCBR-01). Springer, Lecture Notes in Artificial Intelligence. Vancouver, Canada.

- **Projects and Collaboration; Scientific Achievements:**
 - Members of the AIA WG at Uni Aberdeen and HP-Labs have begun to explore the impact of Semantic Web technologies (RDF, DAML+OIL) on Adaptive Information Agents. A visit to Uni Aberdeen by Ian Dickinson (HP Labs) is planned for the near future to discuss possible lines of collaboration.

- WG members at Uni Aberdeen, NCR and Sharp European Research Labs have investigated a range of methods for user-profile representation and evolution. In particular, the relationship between supervised and unsupervised learning methods have been studied.
- WG members at Uni Aberdeen, NCR, UP Catalunya, U Torino, ChangingWorlds have been developing a range of adaptive recommender system applications in areas such as: tourist information, TV listings, financial products.
- **Software Developments:**
I Dickinson - DAML API for the JENA Toolkit. Provides support for DAML+OIL which may be of use to researchers developing next-generation intelligent information agents.
- **Organisation of Events:**
User Modelling 2001 (UM 01) UM '01 Workshop on Personalisation in Future TV [L Ardissono]
- **Presentations:**
P Edwards - 14 December 2001, "Adaptive Information Agents: An AgentLink-II Perspective", Invited Talk at EUNITE-2001, Tenerife.

Organisational Issues and Next Actions

After some discussion it has been agreed upon that the AIA working group has to be newly formed and re-activated. The current group chair Pete Edwards will resign due to his assignment of co-ordinating the new inter-network SIG on adaptation and agents. Let's name it, this "spin-off" is already the second major contribution of the I2A SIG to the European scientific research community which clearly underlines the significant impact of the activities of the SIG members.

The I2A SIG will also be promoted by a book project. The book "Intelligent Information Agents: An AgentLink Perspective" edited by Matthias Klusch (DFKI, Germany), Sonia Bergamaschi (University of Modena, Italy), Pete Edwards (University of Aberdeen, UK), and Paolo Petta (Austrian Research Institute for Artificial Intelligence) will be published by Springer Verlag in the series LNCS State of the Art Survey probably in fall 2002.

As mentioned above, there will be no funded SIG meetings in 2002. Thus we strive to individual working group meetings in co-location with highly frequented scientific events (conferences, workshops) on demand. Proposals to host such meetings are more than welcome! The same goes with any suggestion where to possibly co-locate some SIG or working group meetings. The date, venue, and topics of such meetings will then be announced immediately on the SIG's activity web page (<http://www.dfki.de/~klusch/i2aActiv.html>) and via the SIG's mailing list infoagents@gmd.de.

After more than three years the SIG's web pages hosted by DFKI, Germany, are currently under a complete redesign. The new SIG web pages are already relocated to and will be hosted by the University of Modena, Italy. Availability of these pages is expected by end of January.

For further information on the activities of the I2A SIG please contact the co-coordinators Matthias Klusch (klusch@dfki.de) and Sonia Bergamaschi (sonia.bergamaschi@unimo.it).