8th International Workshop CIA-2004

Cooperative Information Agents

September 27 - 29, 2004,
Erfurt, Germany
Fair and Congress Center

Program

CIA-2004 Program

Monday, September 27

8:45   Welcome

9:00 - 10:00 **CIA 2004 & NOD 2004 Invited Talk**

Agents and OWL-S

Terry Payne (UK)

10:00 - 10:15 Coffee Break

10:15 - 13:30
Session 1:   Information Agents and P2P Computing

10:15 - 10:45
Design and Implementation of Agent Community based Peer-to-Peer Information Retrieval
Tsunenori Mine, Daisuke Matsuno, Akihiro Kogo, Makoto Amamiya (Japan)

10:45 - 11:15
Towards Monitoring of Group Interactions and Social Roles via Overhearing
Silvia Rossi, Paolo Busetta (Italy)

11:15 - 11:45
A Probabilistic Approach to Predict Peers' Performance in P2P Networks
Zoran Despotovic, Karl Aberer (Switzerland)

11:45 - 12:00 Coffee Break

12:00 - 12:30 (Part of Session 6: Cooperation in Open Environments)
Auction Equilibrium Strategies for Task Allocation in Uncertain Environments
David Sarne, Meirav Hadad, Sarit Kraus (Israel)

12:30 - 13:00 Special Report

13:00 - 14:30 Lunch Break

14:30 - 15:15 **CIA 2004 & NOD 2004 Invited Talk**

**Agent-Based Distributed Data Mining:
Current Pleasures, and Future Directions**

Hillol Kargupta (USA)

15:15 - 15:30 Coffee Break

15:30 - 17:00
Session 2:   Communication

15:30 - 16:00
**On the Impact of Agent Communication Languages on the
Implementation of Agent Systems**
Juan Manuel Serrano, Sascha Ossowski (Spain)

16:00 - 16:30
**Reasoning about Communication:A Practical Approach based on
Empirical Semantics**
Felix Fischer, Michael Rovatsos (Germany)

16:30 - 17:00
**The Evolution of Probabilistic Reciprocity in a Multi-agent
Environment with Neighborhoods**
Enda Ridge, Michael G. Madden, Gerard J. Lyons (Ireland)

Tuesday, September 28

9:00 - 10:00 NOD 2004 Keynote Talk (Jim Koplien)

10:00 - 10:15 Coffee Break

10:15 - 13:30
Session 3:   Recommender Agents, and Systems

10:15 - 10:45
Collaboration Analysis in Recommender Systems using Social Networks
Jordi Palau, Miquel Montaner, Beatriz López, Josep Lluís De la Rosa (Spain)

10:45 - 11:15
Qualitative Analysis of User-based and Item-based Prediction Algorithms for Recommendation Agents
Manos Papagelis, Dimitris Plexousakis (Greece)

11:15 - 11:45

> ➢ **Open Discussion (1)** - Talks on Monday and Tuesday morning
> ➢ System Demonstration Set up

11:45 - 12:00 Coffee Break

12:00 - 13:30 **CIA 2004 System Innovation Award Final**

> ➢ System demonstration (30 min): **A-globe: Agent Platform with Inaccessibility and Mobility Support**.
> David Sislák, Milan Rollo, Michal Pìchoucek. Dept. of Cybernetics, FEE, Czech Technical University, Czech Republic
> ➢ **Summary Statement and Open Discussion** (50 min)
> ➢ Public Voting (10 min)

13:30 - 14:30 Lunch Break

14:30 - 15:15 **CIA 2004 & NOD 2004 Invited Talk**

Society-Centred Design for Socially Embedded Multi-Agent Systems

Toru Ishida (Japan)

15:15 - 15:30 Coffee Break

15:30 - 17:00
Session 4: Information Agents and Mobile Computing

15:30 - 16:00
Agents that Coordinate Devices, Services, and Humans in Ubiquitous Computing
Akio Sashima, Noriaki Izumi, Koichi Kurumatani (Japan)

16:00 - 16:30
Multi-Agent Technology as an Enabler of Computer Supported Cooperative Work for the Mobile Workforce
Habin Lee, Patrik Mihailescu, John Shepherdson (UK)

16:30 - 17:00
A-globe: Agent Platform with Inaccessibility and Mobility Support
David Sislák, Milan Rollo, Michal Pìchouèek (Czech Republic)

17:00 - 17:15 Coffee Break

17:15 - 18:45
Session 5:   Industrial Applications

17:15 - 17:45
Supply Chain Management using Cooperative Multi-Agent Mode
Keonsoo Lee, Wonil Kim, Minkoo Kim (South Korea)

17:45 - 18:15
An agent simulation model for the Québec Forest Supply chain
Thierry MOYAUX, Brahim CHAIB-DRAA, Sophie D'AMOURS (Canada)

18:15 - 18:45
Performance analysis of multiagent industrial system
Tomasz Babczynski, Zofia Kruczkiewicz, Jan Magott (Poland)

***19:30 - 20:30 NOD 2004 NetTogetherMeeting
(Welcome Reception)***

Wednesday, September 29

9:00 - 10:00 NOD 2004 Keynote Talk

10:00 - 10:15 Coffee Break

10:15 - 11:45
Session 6:   Cooperation in Open Environments

10:15 - 10:45
The RoleX Environment for Multi-Agent Cooperation
Giacomo Cabri, Luca Ferrari, Letizia Leonardi (Italy)

(Re-scheduled for Monday, 12:00 - 12:30)
Auction Equilibrium Strategies for Task Allocation in Uncertain Environments
David Sarne, Meirav Hadad, Sarit Kraus (Israel)

10:45 - 11:15
Agent's Multiple Inquiries for Enhancing the Partnership Formation Process
David Sarne, Sarit Kraus (Israel)

11:15 - 11:45 Special Report
Rational Cooperative Agents in Open Environments
Matthias Klusch (Germany)

11:45 - 12:00 Coffee Break

12:00 - 13:00
Open Discussion (2) - Talks on Tuesday afternoon and Wednesday

13:00 - 13:30
Closing of CIA 2004

- **CIA 2004 Best Paper Award Giving**
- **CIA 2004 System Innovation Award Giving**
- **CIA 2005 Announcement**

13:30 - 14:30 Lunch Break

14:30 -15:15 NOD 2004 Invited Talk

15:15 - 15:30 Coffee Break

15:30 - 19:00

CIA 2004 In-Depth Tutorial

Semantic Web Services and Agents

Terry Payne (UK)

In between: Coffee break 17:00 - 17:15

20:30 - 21:30   NOD 2004 NetObjectNight (Social Event)

CIA 2004 Invited Talks

Agents and OWL-S

Terry Payne (UK)

Although Semantic Web Services have recently received a great deal of attention, the use of semantics to describe distributed cooperating components is not new. Multi-Agent Systems have long addressed the problems of coordinating heterogeneous, autonomous components so that they can collaborate and achieve joint goals. Several MAS use semantic descriptions to achieve a shared understanding of communications (both the purpose of the communication, and the contents of the communication); however these solutions typically enable only a modest number of disparate MAS to collaborate. With current advances in the Semantic Web, and Semantic Web Services, it may be possible to relax these constraints.
The DARPA Agent Markup Language for Services (DAML-S) was proposed as a solution to discovering and automating the composition of services. Two years on (and a name change to OWL-S), it has gained widespread interest; yet is viewed as a Web Services proposal augmented through semantics, rather than a markup language for Agents. This paper presents an agent-oriented perspective of OWL-S, including an alternative set of usage metaphors. The emerging problems for agent-based adoption are discussed, as well as potential solutions that address this divergence.

Terry Payne
University of Southampton
Electronics and Computer Science
4211 Zepler Hall
Highfield, Southampton, UK
Voice: +44 (0)23 8059 8343
Fax: +44 (0)23 8059 2865
Email: trp@ecs.soton.ac.uk
http://www.ecs.soton.ac.uk/~trp/

Dr. Terry Payne is a lecturer at the University of Southampton, having previously been involved with the Intelligent Software Agents Laboratory at Carnegie Mellon University. Prior to working at CMU, I spent five years as a Graduate Student at the Computing Scrience Department, University of Aberdeen, Scotland. His current research is focussed on Semantic Web Services and Agents, and their discovery. Other research interests include Multi-Agent Systems, Information Retrieval systems and Machine Learning techniques.

Agent-Based Distributed Data Mining:

Current Pleasures, and Future Directions

Hillol Kargupta (USA)

Advances in computing and communication over wired and wireless networks have resulted in many pervasive distributed computing environments. The Internet, intranets, local area networks, ad hoc wireless networks, and sensor networks are some examples. These environments often come with different distributed sources of data and computation. Mining in such environments naturally calls for proper utilization of these distributed resources. However, most off-the-shelf data mining systems are designed to work as a monolithic centralized application which usually do not scale up in large distributed applications. The field of Distributed Data Mining (DDM) offers an alternate choice. It pays careful attention to the distributed resources of data, computing, communication, and human factors in order to use them in an optimal fashion. This presentation will first offer a brief overview of the current state-of-the-art DDM Technology. It will then point toward a synergy between multi-agent systems and DDM which may lead to very large scale data intensive problem solving capabilities. It will particularly discuss a few applications in the sensor network and security domains where such a merger particularly appears to be promising.

Hillol Kargupta
Department of Computer Science and Electrical Engineering
1000 Hilltop Circle, University of Maryland Baltimore County
Baltimore, MD 21250, USA
Voice: (410) 455-3972
Fax: (410) 455-3969
Email: hillol@cs.umbc.edu
http://www.csee.umbc.edu/~hillol/

Dr. Hillol Kargupta is an Associate Professor at the Department of Computer Science and Electrical Engineering, University of Maryland Baltimore County. He received his Ph.D. in Computer Science from University of Illinois at Urbana-Champaign in 1996. He is also a co-founder of AGNIK LLC, a ubiquitous data intelligence company. His research interests include mobile and distributed data mining and computation in gene expression.

Society-Centred Design for

Socially Embedded Multi-Agent Systems

Toru Ishida (Japan)

Given the need to realize ubiquitous/pervasive computing, we must be able to control information agents so that they can coexist with humans in the real world. To realize large-scale socially embedded multiagent systems, we propose a new system design methodology towards *society-centered design*. We have already developed the scenario description language Q, which describes interaction protocols that link agents to society. Using the virtual space called *FreeWalk*, wherein agents behave under given Q scenarios, we explain each step of *society-centered design*. The process consists of *participatory simulation*, where agents and human-controlled avatars coexist in virtual space to jointly perform simulations, and *augmented experiment*, where an experiment is performed in real space by human subjects, scenario controlled agents, and human extras. As an application of society-centered design, we are working on *mega navigation*, where millions of humans and socially embedded agents collaborate for developing services for traffic control, crisis management and large-scale event navigation.

Toru Ishida
Laboratory for Global Information Network
Department of Social Informatics
Kyoto University
606-8501 Kyoto, Japan
TEL: +81-75-753-4821
FAX: +81 75-753-4820
Email: ishida@i.kyoto-u.ac.jp
http://www.lab7.kuis.kyoto-u.ac.jp/~ishida/

Dr. Ishida is a full professor of Kyoto University, from 1993, a research professor of NTT Communication Science Laboratories from 1998, a visiting professor of Shanghai Jiao Tong University from 2002, and IEEE fellow from 2002. Dr. Ishida received the B.Eng., M.Eng. and D.Eng. degrees from Kyoto University, Kyoto, Japan, in 1976, 1978 and 1989, respectively. From 1978 to 1993, he was a research scientist of NTT Laboratories; a visiting research scientist at the Department of Computer Science, Columbia University from 1983 to 1984, a guest professor at Institut fuer Informatik, Technische Universitaet Muenchen in 1996, an invited professor at Le Laboratoire d'Informatique de Paris 6, Pierre et Marie Curie in 2000 and 2003, and a visiting professor at Institute for Advanced Computer Studies, University of Maryland in 2002. Toru has been working on *autonomous agents and multiagent systems* for more than twenty years.

Location and Help

The CIA 2004 workshop is part of, and hosted by the **NetObjectDays 2004** multi-conference which takes place at the fair and congress center of Erfurt city.

Address of the CIA-2004 workshop location

Erfurt Messe (Fair and congress center)
Gothaer Straße 34
99094 Erfurt
Germany

Erfurt is the capital city of the *Freistaat Thüringen* (State of Thuringia, in the so called "green heart of Germany") geographically located in the eastern part of Germany. It has nearly 200,000 citizens and is considered one of the most beautiful cities of Germany. The nearest major hub is Frankfurt am Main airport.

Erfurt was first recognized in 742 A.D., and since then has grown in the middle ages from being an important intersection of the old trading routes to become a powerful centre of trading industries, and with an important university. Erfurt's cultural, intellectual and economic strengths brought great personalities such as Luther (Augustinian monastery), Adam Riese, Johann Wolfgang von Goethe, Friedrich Schiller, Johann Sebastian Bach, Wilhelm von Humboldt, Zsar Alexander, Napoleon, Herder and Wieland.

How to reach Erfurt main station from Erfurt airport?
From Erfurt airport you can either (1) take a taxi; or (2) use public transportation. In case you prefer public transportation you have two options: (a) take the bus line 91 or 92 departing near the airport (stop called "Flughafen - Büropark") all days, and change at the bus stop "Hauptfriedhof" to the tram line no. 4 direction "Hauptbahnhof", or (b) Monday - Friday: take the shuttle bus line 99 (direction "Hauptbahnhof", bus stop of line 99 is situated in front of terminal B; bus line 99 is *not operating* on saturday/sunday/public holidays).

How to reach the fair and congress center from Erfurt main station?
From Erfurt main station you may either take a taxi, or the tram line no. 2 (direction "Messe") until its final stop from which it just takes a 5 minutes walk to reach the main entry of the fair and congress center.

For local advice and help before or during the conference
- ➢ *At conference days* please first contact the local organisers of NOD 2004 multiconference - tranSIT company - at +49-(0)-3677-845-106
- ➢ Otherwise you may also contact either the local co-chair Rainer Unland at +49-(0)-201-183-3421 (secretary Mrs. Lennartz), or Matthias Klusch at +49-(0)-177-2542399 (mobile)

CIA 2004 Organisers

Matthias Klusch is a Research Fellow (Principal Investigator) of the German Research Center for Artificial Intelligence (DFKI) in the Deduction and Multiagent Systems lab. Dr. Klusch is general chair of the international annual workshop series on cooperative information agents since 1997; program committee member of major international conferences on agent-based computing, AI, and information systems; editorial board member of international scientific journals; project reviewer for different national science funding organisations across Europe; and involved in the coordination of various funded national and international R&D projects in the IT domain. His research interests are theory and applications of AI, intelligent information systems, and agent technology; with current focus on flexible Semantic Web service discovery, negotiation, and composition; secure distributed knowledge discovery; quantum information processing systems and agents.

www.dfki.de/~klusch

Sascha Ossowski is an Associate Professor of Computer Science at the University Rey Juan Carlos in Madrid where he leads the Artificial Intelligence Research Group. Formerly, he was an HCM/TMR research fellow at the AI Department of Technical University of Madrid. He obtained his MSc degree in Informatics from the University of Oldenburg (Germany) in 1993, and received a PhD in Artificial Intelligence from Technical University of Madrid in 1997. Prof. Ossowski is holding several research projects focussing on the development of advanced software systems based on Artificial Intelligence and Agent Technology. He has published a monograph and more than 40 research papers on agent co-ordination and communication, and their application to real-world problems such as transportation management, e-commerce or network management. He served as programme committee member for numerous international conferences and workshops, and acted as a scientific adviser in various Spanish research programmes. www.ia.escet.urjc.es/~sossowski/

Vipul Kashyap is a Senior Medical Informatician at Partners HealthCare System, Inc. Dr. Kashyap is currently working in the Clinical Informatics R&D department on issues related to Clinical Knowledge Management, including the development of a Knowledge Management portal for uniform access to clinical content being used across all of Partners' hospitals and subsidiaries; techniques for implementing and deploying controlled medical terminologies (CMT) in a consistent manner and developing a reference architecture for an enterprise wide clinical information system. Formerly, he was a Research Fellow at the National Library of Medicine, where he worked in the Lister Hill National Center on Biomedical Communicationson issues relating to the Semantic Web and Medical Ontologies. lsdis.cs.uga.edu/~kashyap/

Rainer Unland is a full professor in computer science at the institute for computer science and business information systems at University of Duisburg-Essen (Germany) as head of chair for Data Management Systems and Knowledge Representation. He earned his Diploma in Computer Science from University of Dortmund/Germany in 1980. In 1985, respectively 1992, he earned his Ph.D. and habilitation, both from University of Hagen. Since then he worked at several universities as (visiting) professor in practical computer science (Passau, 1991; Münster, 1991-1995; Ilmenau, 1995; Essen, since 1995, Calgary, 2002). He has authored, co-authored and edited numerous publications, journals and books in the areas of non-standard/object-oriented database management systems, object- and aspect-oriented software development, advanced transaction management, computer supported cooperative work, and (distributed) artificial intelligence. Moreover, he has served as Chair and/or PC member for many national and international conferences, workshops and symposia; is co-founder of the annual international conference Netobjectdays that, as a highly successful applied conference, serves as kind of umbrella for topics as software engi-neering technologies, multi-agent system technologies, Web-Services and the Internet. dawis.informatik.uni-essen.de/site/site/staff/unlandr/

CIA 2004 Sponsors

CIA 2004 Main Sponsor:

tranSIT GmbH, a limited company, sees itself as a centre of competence for the Thuringia state of the federal republic of Germany in the areas software engineering, communications technology, and new media. Its aim is to support the creation of new jobs by improving the competitiveness of companies based in Thuringia by creating synergy of science and relevant industry in the area. In particular, tranSIT GmbH's business is to coordinate related technology transfer, generate and support technology projects. In this respect, tranSIT functions as an advice centre, a demonstration centre, a training centre, and an application centre for the technology of information and communications. Our emphasis is on: software engineering, communications technology and shared processing of information, multimedia: the new media - their technology and graphics.
www.transit-online.de/

CIA 2004 System Innovation Award Sponsor:

Whitestein Technologies is a young international IT company, specialized in the design and development of advanced agent-based systems, applications, and technologies, combined and well integrated with other advanced information and communication technologies (eg. mobile wireless computing) and current state-of-the-art technologies (eg. Java J2EE). Whitestein pursues a well-focused, integrated and balanced approach on parallel paths in order to realize the agents technologies' potential for better solutions and thus additional customer benefits and profits. Technology Research: academic partnerships and international research projects; systematic exploration and analysis of relevant technologies and architectures; prototyping and proof of concepts; publishing; contributions to standardization bodies. Technology Development: industrial partnerships and joint ventures; development of conceptual frameworks; development of mostly industry-agnostic (horizontal) technology products and solutions. Technology Application: development of industry-specific (vertical) products and solutions, including the development and integration of customer-specific applications. Technology Consulting: know-how transfer to customers and partners; management consulting and professional support services; training and education; conferences and events. www.whitestein.com/

CIA 2004 Best Paper Award Sponsor:

Asociación Española para la Inteligencia Artificial (AEPIA)
aepia.dsic.upv.es/

CIA 2004 Invited Speaker Travel Grant:

The **Agentlink III** coordinating action provides financial support for one invited speaker of the CIA 2004 workshop. AgentLink III is the new European Co-ordination Action for Agent Based Computing, a network of researchers and developers with a common interest in agent technology. Launched on 1st January 2004, it follows on from AgentLink II, and will continue to provide resources and information on Agent-Based research across Europe. www.agentlink.org

CIA 2004 Student Travel Grants:

infodoc.escet.urjc.es/DMR

International Workshop Series on
Cooperative Information Agents
www.dfki.de/~klusch/IWS-CIA-home.html

The **DMR Decision Engineering Lab** of the Universidad Rey Juan Carlos in Madrid, and the international **workshop series on cooperative information agents, together with Whitestein and AEPIA** provide limited financial support to students who are co-authors of accepted papers to give their presentation at the CIA 2004 workshop.

The CIA 2004 workshop is organised in cooperation with ACM SIGArt and SIGWeb