
Tuesday, December 6th: 19.00h : pre-registration + Beer degustation in La Becasse

Wednesday, December 7th

08.15h-09.15h: Registration + Coffee

09.15h-09.30h: Opening

09.30h-10.30h: **Invited Talk**

Room: Troonzaal

Sustainable Agent Communities

Sandip Sen.

10.30h-11:00h: Coffee Break

Room: Marmeren zaal

11:00h-13.00h: **Paper session I**

Session I.1 Coordination - Communication - Environment

Room: Rubens Auditorium

Chair: to be announced

Gradient Field-Based Task Assignment in an AGV Transportation System, *Danny Weyns, Nelis Boucke, Tom Holvoet, Wannas Schols*

Dealing with multi-agent coordination by anticipation: application to the traffic simulation at junctions, *Arnaud Doniec, Stéphane Espié, René Mandiau, Sylvain Piechowiak*

Efficient Propagation of Uncertain Information (A rumor-based approach), *Bourgne, Maudet, Pinson*

Tag interactions in Multi-Agent Systems: Environment Support, *E. Platon, Nicolas Sabouret, Shinichi Honiden*

discussion: to be announced

Session I.2 Self-organisation I

Room: Stevin Zaal

Chair: **Paul Valckenaers, Katholieke Universiteit Leuven, Belgium**

Cellular collective resolution in artificial neuro-agent networks, *Mano Jean Pierre,*

Glize Pierre

Multi-type ACO for light path protection, *Peter Vrancx, Ann Nowe, Kris Steenhaut*

Cooperative Self-Organization: Modeling and Experiments of Local Decision to Solve Distributed Problems, *Gauthier Picard, Pierre Glize*

Simulation of Cooperative Behavioral Trends by Local Interaction Rules
Osnat Shapira, Zinovi Rabinovich, Jeffrey S. Rosenschein

discussion: Question proposed by Paul Valckenaers

Research on self-organization typically aims at discovering how to build and engineer self-organizing software systems. However, a poor choice of component types (agents and otherwise) is likely to result in software solutions that are as short-lived and maintenance-prone as the typical existing software today. Some researchers therefore propose that agent should be things not functions and agents should be small. In the extreme, these are sufficient but not necessary preconditions (too strict). What are the real constraints for components/agents in a self-organizing design?

Session I.3 Argumentation - Auctions

Room: Marie-Therese Zaal

Chair: **Wiebe Van der Hoek, University of Liverpool, UK**

Extensive-Form Argumentation Games, *Ariel D. Procaccia, Jeffrey S. Rosenschein*

Multi-Agent Argumentation for eDemocracy, *Katie Atkinson, Trevor Bench-Capon, Peter McBurney*

Multi-Unit Combinatorial Reverse Auctions with Transformability Relationships among Goods, *Andrea Giovannucci, Juan A. Rodríguez-Aguilar, Jesús Cerquides*

Optimizing Auctioneer's Revenues in Expanding Auctions, *Onn Shehory, Eran Dror*

discussion: Questions proposed by Wiebe Van der Hoek

1) In argumentation frameworks, how do we distinguish between that what is commonly accepted, and can be used for justification on the one hand, and that what is open for debate, on the other hand?

2) Auction Theory now offers a lot of valuable results on specific auctions, with specific assumptions about transformability, multi/single items, divisibility of goods, etc. Is there hope for a Unified Theory of Auctions?

Session I.4 Web services Web semantic Ontology

Room: Troonzaal

Chair: **Paul Davidsson, Blekinge Institute of Technology, Sweden**

COOWS: Adaptive BDI Agents Meet Service-Oriented Computing, *Luigi Bozzo, Viviana Mascardi, Davide Ancona, Paolo Busetta*

Terminological Heterogeneity between Agents Using a Generalized Simplicial Representation, *Jean-Paul Sansonnet, Erika Valencia*

An Agent Architecture for Ensuring Quality of Service by Dynamic Capability Certification, *Thorsten Scholz, Ingo J. Timm, Rainer Spittel*

A Multi-agent System for Distributed Ontology Learning, *David Sanchez, Antonio Moreno*

discussion: Questions proposed by Paul Davidsson

1. *We are beginning to understand that there is a close relation between web services and software agents. However, different views have been expressed. What are the differences and similarities between web services and software agents?*

2. *Ideally two arbitrary autonomous agents in an open society (environment) should be able to understand each other in order to cooperate, negotiate, etc. However, this is a very complex problem; even human beings from different cultures may have difficulties with this. What problems of semantic interoperability in open agent societies cannot be solved using existing technology? Are any of these impossible to solve?*

13.00h-14.00h: Lunch

Room: Marmeren Zaal

14.00h-16.00h: **Paper session II**

Session II.1 Communication - Protocols

Room: Troonzaal

Chair: **Juan Pavon, Universidad Complutense Madrid, Spain**

ABITS FIPA Messenger, *Bernard-Joseph M. Roche, Eleni E. Mangina*

A commitment-based Communicative Act Library, *Mario Verdicchio, Marco Colombetti*

A Multi-Agent System Model of Dialogue, *Bel-Enguix, Gemma, Jiménez-López, M. Dolores*

Protocol Synthesis with Dialogue Structure Theory, *Jarred McGinnis, David Robertson, Chris Walto*

discussion: Questions proposed by Juan Pavon

- 1) *What makes agent communication different from classical process communication?*
- 2) *How far (or near) is the communication between agents and web services?*
- 3) *Will agents someday be able to learn how to communicate with other agents?*
- 4) *Is FIPA ACL enough for agent communications?*

Session II.2 Self-organisation

Room: Stevin Zaal

Chair: **Vincent Chevrier, LORIA, Nancy, France**

Cooperative Self-Organization to Design Robust and Adaptive Robotic Collectives,
Gauthier Picard, Marie-Pierre Gleizes

Pervasive Pheromone-based Interactions with RFID Tags, *Marco Mamei, Franco Zambonelli*

Cognitive Stigmergy: A Framework Based on Agents and Artifacts, *Alessandro Ricci, Andrea Omicini, Mirko Viroli, Luca Gardelli, Enrico Oliva*

MAS Coordination and Control Based on Stigmergy, *Paul Valckenaers, Hadeli, Bart Saint Germain, Paul Verstraete, Hendrik Van Brussel*

discussion: Questions proposed by Vincent Chevrier

The papers present different approaches to build self-organizing systems. Since these systems are built (and functioning) one can ask on how to improve the quality of the results, is it specific to the used approaches or can some trends be identified?

Session II.3 Agent Models, Theory of agency

Room: Rubens Auditorium

Chair: **Jean-Paul Sansonnet, LIMSI Paris, France**

Expansion Operators for Modelling Agent Reasoning in Possibilistic Defeasible Logic Programming, *Carlos Chesñevar, Guillermo Simari, Lluís Godo, Teresa Alsinet*

BDI^AATL : An Alternating-time BDI Logic for Multiagent Systems, *Roberto Montagna, Giorgio Delzanno, Maurizio Martelli, Viviana Mascardi*

Adversarial Behavior in Multi-Agent Systems, *Martin Rehak, Michal Pechoucek, Jan Tozicka*

T-LAIMA: Answer Set Programming for Modelling Agents with Trust, *Marina De Vos, Owen Cliffe, Richard Watson, Tom Crick, Julian Padget, Jonathan Needham*

discussion: Questions proposed by Jean-Paul Sansonnet

1) New trends in MAS "Agent Models, Theory of agency" are now related with the notion of "opposition" between the agents: arguing, adversariality,... and their counterparts: trust, open-commitment,... Why is it that opposition seems now more important than cooperation? or is it just a symmetrical problematic?

2) Rationality in MAS has long been based on (quite) complete-knowledge environments in order to compute optimal solutions. But new models of agents seem to take more into account the notion of "openness" and to discuss some implications like: semantic heterogeneity, contradiction, mis-trust, arguing, ... Are these new questions challenging the notion of straight rationality and if so, what new definition can we bring about?

3) In the framework of MAS "Agent Models, Theory of agency", most propositions are descriptives but new attempts are made to use more applicative tools which combine both the ability to describe formally a problem and to develop software components (like ASP, Mapple, ...). Is it desirable and more feasible, to successfully bridge the gap between agent models and agent systems?

16.00h-16.30h: Coffee Break
Room: Marmeren Zaal

16:30h - 17:30h Invited Speaker
Room: Troonzaal
Action-Reaction in Multi-Agent Games
Han La Poutre.

17:45 - 19:30 Guided Walk through Brussels Centre

19.30h : **Dinner:** La Manufacture

Thursday, December 8th

9:00h - 09.30h : Registration + Coffee

9.30h-11.30h: **Paper session III**

Session III.1 AOSE Interactions Protocols

Room: Rubens Auditorium

Chair: **Federico Bergenti, Università di Parma, Italy**

A Framework for building EI-Enabled Intelligent Organizations using MAS technology, *Armando Robles P., Pablo Noriega B-V*

A Compositional Framework for the Specification of Interaction Protocols in

Multiagent Organizations, *Juan Manuel Serrano, Sascha Ossowski*

Towards an Interaction-based Design of Behaviors, *Philippe Mathieu, Sébastien Picault*

Communication Attitudes: A Formal Account of Ostensible Beliefs and Intentions,
Matthias Nickles, Felix Fischer

discussion: Questions proposed by Federico Bergenti

1) *Generally speaking, interaction is considered a first class citizen of the agents_ world. Interaction can be structured (e.g., IPs), reasoned (e.g., ACLs and their semantics) and finally exploited as the medium supporting the concretization of the overall behaviour of a MAS. In this context, are the abstractions that we have today sufficient to express this peculiar and central role of interactions? Do we need something more? Something else?*

2) *The design of interactions in a MAS is sometimes considered a central task of the designer. Notably, most AOSE methodologies do not treat extensively the problem of designing and reasoning on the properties of interactions. Rather, the design of interactions is (i) completely lost in the sea of the design phase, or (ii) absolutely omitted because agents are equipped with a means to arrange themselves (without a prior intervention of the developer). Are these opposite approaches the only ways we have to tackle the design of interactions? Can we think of mixed approaches?*

3) *The very fact of (still) using FSMs and classic (dynamic) logic frameworks to model complex interactions seems somehow strange. Shall we try new formalisms to model and reason on interactions? (Emergent behaviours? Ants? Entropy? &) Or we better stick on well-known, predictable formalisms?*

Session III.2 MAS Simulations - Platforms

Room: Stevin Zaal

Chair: **Giovanni Rimassa, Whitestein Technologies AG, Switzerland**

GeneCity: A Multi Agent Simulation Environment for Hereditary Diseases,
Demetrios G. Eliades, Andreas L. Symeonidis, Pericles A. Mitkas

Approaches for Resolving the Dilemma between Model Structure Refinement and Parameter Calibration in Agent-Based Simulations, *Manuel Fehler, Franziska Kluegl, Frank Puppe*

Introducing an Agent-based Simulation Platform for Group Buying Models,
Hossein Sharif, David Brée, Armin Shams

Agent-Based Unsupervised Grammar Induction, *Guy De Pauw*

discussion: Questions proposed by Giovanni Rimassa

1. *"How useful can Agent Based Simulation be in general software and system design?"*

2. "When modeling simulation scenarios, what difference does it make whether an entity of the model is given or chosen in the real situation?"

Session III.3 Negotiation - mobility

Room: Troonzaal

Chair: **Carles Sierra IIIA CSCI, Spain**

An Agent-based System for Infomobility Services, *Pavlos Moraitis, Eleftheria Petraki, Nikolaos I. Spanoudakis*

Markets vs Auctions: Approaches to Distributed Combinatorial Resource Scheduling, *Peter Gradwell, Julian Padget*

Issues in a Mobile Agent-based Multimedia Retrieval Scenario, *D.R.A. de Groot, M.L. Boonk, F.M.T. Brazier, A. Oskamp*

A Two-tiered Model of Negotiation Based on Web Service Agreements, *D.G.A. Mobach, B.J. Overeinder, F.M.T. Brazier, F.P.M. Dignum*

discussion: Questions proposed by Carles Sierra

1) How do negotiation processes relate to trade relationships building?

2) Are negotiation and persuasion processes different at all?

3) Do competitive negotiation processes require co-operative information exchanges?

11.30h-13.00h: EUMAS board meeting
Room: Marie-Therese Room

12.00h-13.30h: Lunch
Room: Marmeren Zaal

13.00h-15.00h: **Paper session IV**

Session IV.1 AOSE - Agent Models

Room: Troonzaal

Chair: **Zahia Guessoum, LIP6, Paris, France**

A Discussion on the MDA Approach for Agent Development, *Jorge J. Gómez-Sanz, Juan Pavón*

Software Anatomy of a KGP Agent, *Alexander Yip, Jeremy Forth, Kostas Stathis, Antonis Kakas*

PRACTIONIST: a New Framework for BDI Agents, *Vito Morreale, Susanna Bonura, Giuseppe Francaviglia, Massimo Cossentino, Salvatore Gaglio*

A Multi-Agent System for Intelligent Monitoring of Airline Operations, *Antonio Castro, Eugenio Oliveira*

discussion: Questions proposed by Zahia Guessoum

Several multi-agent meta-models have been proposed to facilitate the design and implementation of multi-agent system. A unification of these meta-models has been proposed (see C. Bernon, M. Cossentino, M. Gleizes, P. Turci, and F. Zambonelli. A study of some multi-agent meta-models. In /Proc. of the Fifth International Workshop on Agent-Oriented Software Engineering (AOSE-2004) at The Third International Joint Conference on Autonomous Agents and Multi-Agent Systems (AAMAS 2004)/, New York, USA, July 2004.<http://www.pa.icar.cnr.it/~cossentino/paper/aose04.pdf>).

How can your proposal be related to these meta-models?

- 1. Can you reuse this meta-model (or any existing meta-model) to have a high level specification of your framework or application?*
- 2. Can you improve this meta-model (by adding new concepts, changing existing concepts ...)*

Session IV.2 Learning / Privacy

Room: Stevin Zaal

Chair: **Viviana Mascardi, DISI, Genova, Italy**

Learning to Identify Winning Coalitions in the PAC model, *Ariel D. Procaccia, Jeffrey S. Rosenschein*

A Learning Algorithm for Multi-Agent Causal Models, *Stijn Meganck, Sam Maes, Bernard Manderick, Philippe Leray*

Privacy in Multi-Agent Learning: Securely Inducing a Multi-Agent Decision Tree, *Karl Tuyls, Bart Kuijpers*

Privacy and Legal Validity in MASs? It is not just a matter of Security and Trust, *Federico Bergenti*

discussion: Questions proposed by Viviana Mascardi

According to the last version of the AgentLink III Roadmap, the ability of agents to learn and adapt to a dynamic environment raises many challenging issues, including privacy.

In the Roadmap, we can read that:

"While learning and adaptation have a long tradition of research, particular contexts raise new issues. In sophisticated autonomic systems, agents continually adapt to the environment of other agents, violating the assumptions of single-agent learning theories, and potentially leading to instabilities. "

Session IV.3 Dynamic systems: model, time

Room: Rubens Auditorium

Chair: **Onn Shehory, IBM Research Lab in Haifa (IS)**

Computational Complexity of Predicting Some Properties of Large-Scale Agent Ensembles' Dynamical Evolution, *Predrag Tasic, Gul Agha*

A Generic Model based on Automata for Multi-Agent Systems, *Davy Capera, Jean Fanchon, Jean-Pierre Georgé, Valérie Camps*

Run-Time Model Checking of Interaction and Deontic Models for Multi-Agent Systems, *Nardine Osman, David Robertson, Christopher Walton*

Verifying Bounds on Deliberation Time in Multi-Agent Systems, *Natasha Alechina, Brian Logan*

discussion: Questions proposed by Onn Shehory

- 1. MAS are fundamentally based on agent interaction. However, the complexity of interaction is a major obstacle to MAS scale-up. What avenues should MAS research explore to address complexity issues? What is there to gain, and to lose, when moving to large-scale MAS?*
- 2. Fielded systems need to provide guarantees on the quality of service and performance they provide. For MAS to be used industrially, they should address quality and performance requirements too. What methods should be used for MAS to provide such guarantees? Could existing approaches be re-used, or do we need new directions?*

15.00h-15.20h: Coffee Break
Room: Marmeren Zaal

15.20h-17.20h: Paper session V

Session V.1 E-Institutions

Room: Troonzaal

Chair: **Mark d'Inverno, University of Westminster, UK**

Implementing Norms in Electronic Institutions, *Andrés Garcia-Camino, Pablo Noriega B.V., Juan Antonio Rodríguez-Aguilar*

Specifying and Analysing Agent-based Social Institutions using Answer Set Programming, *Owen Cliffe, Marina De Vos, Julian Padget*

MoiseInst: An Organizational Model for Specifying Rights and Duties of Autonomous Agents, *Benjamin Gateau, Olivier Boissier, Djamel Khadraoui, Eric Dubois*

Agent Protocols for Peer-To-Peer Architectures, *Christopher D. Walton*

discussion: Questions proposed by Mark d'Inverno

- 1. We use words like norms, permissions, obligations and organisations pretty freely when trying to reason at an intuitive level about how to design protocols that take into account the social context of agents' communication. (once again!) We have lots of different logics around for trying to structure this space but we are a long way of any*

agreement. Does this matter for the time being? Will this matter in the future?

- 2. Will we ever have an agreed methodology for designing the space of interactions for a new agent system? Do we care?*
- 3. Of course the design of agent interactions is key to the success of agent systems in general. Do you honestly believe your work will, in some form or other, function as part of a significant commercial (or widely available) system or infrastructure in the future? What stands in your way? What more should we be doing to make this happen?*

Session V.2 Coalitions

Room: TroonZaal

Chair: **Pablo Noriega, III A CSCI, Spain**

Distributing Coalitional Value Calculations among Cooperative Agents, *Talal Rahwan, Nicholas R. Jennings*

Junta Distributions and the Average-Case Complexity of Manipulating Elections, *Ariel D. Procaccia, Jeffrey S. Rosenschein*

The Communication Complexity of Coalition Formation Among Autonomous Agents, *Ariel D. Procaccia, Jeffrey S. Rosenschein*

An analysis of the Shapley Value and its Uncertainty for the Voting Game, *Shaheen Fatima, Michael Wooldridge, Nicholas R. Jennings*

discussion: Questions proposed by Pablo Noriega

The papers in this session address classical problems or involve classical techniques of Game Theory, Mechanism Design, Experimental Economics or Complexity Theory. How is the agent paradigm contributing to the work in these fields? In what way the notion of software agent makes the approaches novel? Where do you expect that (because of agent research) new interesting questions might arise?

Session V.3 Actions and Planning

Room: Stevin zaal

Chair: **Beatriz Lopez, University of Girona, Spain**

Dynamics Based Control: An Introduction, *Zinovi Rabinovich, Jeffrey S. Rosenschein*

Diagnosis of plan execution and the executing agent, *Nico Roos, Cees Witteveen*

Coordination through Plan Repair, *Roman van der Krogt, Mathijs de Weerd*

Combining Agent-Based Approaches and Classical Optimization Techniques, *Jan A. Persson, Paul Davidsson, Stefan J. Johansson, Fredrik Wernstedt*

discussion: Questions proposed by Beatriz Lopez

Imagine a future scenario in which we are required to build a planner agent (either single or composed by multiple agents) for a robot that takes care of elderly people. The planner agent should deal with many different problems to solve, in order to achieve his goal: "surveillance" of a person. Each problem is characterized by several features. For example, in an indoor situation, the planner agent should deal with door opening, arm chair avoidance, etc., while in an outdoor situation the planner agent should deal with other citizens, cars, etc. Assume that there are some techniques available to deal with many of the problems. Then, the key issue is how to select the best technique for each problem, or to combine some of them, as a kind of selfconfiguring planning agent.

Regarding planning techniques local to agents presented in the session:

- 1. How can we take advantage of the interaction with other agents?*
- 2. Is it possible to parameterise at some extend the method so that a planner agent can use it in a self-configuration process?*

Regarding methods to distribute planning:

- 1. The planning problem, is it still the same or a redefinition is required, and so new methods need to be developed?*
- 2. If the problem is the same, to what extend can AI methods be extended to be used as distributed planning?*

17.20h-17.30h: Closing
Room: Troon Zaal

17.30h : Belgian Beer reception
Room: Marmeren Zaal

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