

## WOA 2017 Full Program

Thursday, 15 June

8.30-9.00: Prof. Domenico Rosaci. WOA Presentation.

9-10: Invited Talk. Prof. Sergio Greco. *Abstract Argumentation for Multi Agent Systems*

### Abstract

*Argumentation Frameworks (AFs) are a well-known formalism supporting various forms of interaction among autonomous agents which has emerged as a central field in Artificial Intelligence. Differently from other argumentation frameworks, in AF the abstraction level is very high and only the interaction between arguments, using a binary relation indicating that an argument attacks another one, is modeled, whereas the origin and the structure of arguments is left unspecified.*

*Although the underlying idea is very simple and intuitive, most of the semantics proposed so far suffer from a high computational complexity. Complexity bounds and evaluation algorithms for AFs have been deeply studied in the literature, but these researches focused on 'static' frameworks, whereas, in practice, Multi Agent Systems (MAS) and AFs are not static. Typically an AF represents a temporary situation as new arguments and attacks continuously can be added/removed to take into account new available knowledge. This may change significantly the conclusions that can be derived. Surprisingly, the definition of evaluation algorithms and the analysis of the computational complexity taking into account such dynamic aspects have been mostly neglected, whereas in these situations incremental computation techniques can greatly improve performance. Sometimes changes to the AF can make small changes to the set of conclusions, and recomputing the whole semantics from scratch can be avoided.*

*After having discussed different semantics for AFs the talk presents the problem of incrementally computing extensions for dynamic AFs: given an initial extension and an update (or a set of updates), we devise a technique for computing an extension of the updated AF under different well-known semantics (e.g., complete, preferred, stable, ideal and grounded). The idea is to identify a reduced (updated) AF sufficient to compute an extension of the whole AF and use state-of-the-art algorithms to recompute an extension of the reduced AF only. Experimental results showing the effectiveness of approach are also presented.*

**Sergio Greco** is a full professor in Computer Science (since 2000), chair of the Department of Informatics, Modeling, Electronics and System Engineering and adjunct professor at the University "Magna Graecia" of Catanzaro. He has been the coordinator of the PhD program in Computer Engineering at the University of Calabria. He has written more than 200 papers including more than 60 journal papers. His primary research interests include database theory, data integration, inconsistent and incomplete databases, logic and deductive databases, artificial intelligence, logic programming, nonmonotonic reasoning and data mining. He is co-founder of two spin-off of University of Calabria (Exeura s.r.l. and Ithea s.r.l.) working in the field of knowledge representation.

10-11: Session 1. **Software Agent Engineering** (Chair: Giuseppe Sarnè)

- Valeria Seidita, Massimo Cossentino and Luca Sabatucci. Towards an Approach for Engineering Complex Systems: Agents and Agility
- Fabrizio Messina, Corrado Santoro, Giuseppe Pappalardo, Massimiliano De Benedetti and D'Urso Fabio. 3D Simulation of Unmanned Aerial Vehicles
- Emilio Picasso, Maria Nadia Postorino and Giuseppe M.L. Sarnè. A Study to Promote Car-Sharing by Adopting a Reputation System in a Multi-Agent Context

11-11.30: Coffee break

11.30-12.30: Session 2. **Social Interactions and Trust in Agent Societies** (Chair: Fabrizio Messina)

- Rino Falcone and Alessandro Sapienza. How can Subjective Impulsivity play a role among Information Sources in Weather Scenarios?
- Lidia Fotia, Fabrizio Messina, Domenico Rosaci and Giuseppe M. L. Sarnè. On the impact of trust relationships on social network group formation
- Filippo Laganà, Domenico De Carlo and Salvatore Calcagno. An Agent-based System to Monitor an Energy Biomass Process

12.30-14.00: Lunch break

14.00-15.00: Session 3. **Formation of Agent Groups and Communities** (Chair: Pasquale De Meo)

- Fabrizio Messina, Domenico Rosaci, Pasquale De Meo and Giuseppe M.L. Sarne'. Improving Agent Group Homogeneity Over Time
- Stefania Monica and Federico Bergenti. An Analytic Model of the Impact of Skeptical Agents on the Dynamics of Compromise
- Lidia Fotia. Generating Trust-Based Recommendations for Social Networks organized by Groups

15.00-15.30: Coffee break

17.00. EXCURSION TO CHIANALEA

20.30. SOCIAL DINNER

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## Friday, 16 June

9-10: Invited Talk. Prof. Andrea Omicini. Micro-intelligence for the IoT: Teaching the Old Logic Dog New Programming Tricks

### Abstract

*New application scenarios for pervasive intelligent systems open novel perspectives for logic-based approaches, in particular when coupled with agent-based technologies and methods. In this explorative talk we provide some examples of how logic programming and its extensions can work as sources of micro-intelligence for the IoT, at both the individual and the collective level, along an overall architectural view of IoT systems exploiting logic-based technologies.*

**Andrea Omicini** is Full Professor at DISI, the Department of Computer Science and Engineering of the Alma Mater Studiorum–Università di Bologna, Italy. He holds a PhD in Computer & Electronic Engineering, and his main research interests include multi-agent systems, software engineering, intelligent systems, multi-paradigm languages, autonomous systems, simulation, and self-organisation. On those subjects, he published over 300 articles, edited a number of international books, guest-edited several special issues of international journals, and held many invited talks and tutorials at international conferences and schools

10-11: Session 4. **Agent Architectures, Languages and Technologies** (Chair: Andrea Omicini)

- Federico Bergenti, Eleonora Iotti, Stefania Monica and Agostino Poggi. Overview of an Operational Semantics for the JADEL Programming Language
- Stefano Mariani, Andrea Omicini and Giovanni Ciatto. Novel Opportunities for Tuple-based Coordination: XPath, the Blockchain, and Stream Processing
- Stefania Monica and Federico Bergenti. An Optimization-Based Algorithm for Indoor Localization of JADE Agents

11-11.30: Coffee break

11.30-12.30: Invited Talk. Prof. Luisa Damiano. *The Embodied Approach: a paradigm shift within the Cognitive Sciences?*

**Abstract**

*Since the 1990s it is quite usual, for the literature analyzing the evolution of the Cognitive Sciences, to refer to the contemporary process of development of the so-called Embodied Approach in terms of a “paradigm shift”, alluding to the notion introduced by Thomas Kuhn (1962) to characterize “scientific revolutions”. The talk will explore theoretical and epistemological aspects of the metamorphosis generated by the emergence of the Embodied Approach within the field of the Cognitive Sciences – Artificial Intelligence included. Based on recent mappings of configurations and dynamics characterizing these research domains, the presentation will discuss the possibility of interpreting the ongoing transformation as a Kuhnian process of paradigm transition.*

**Luisa Damiano** (PhD) is Associate Professor of Logic and Philosophy of Science at the University of Messina (Italy). Her main research areas are: Epistemology of Complex Systems; Epistemology of the Cognitive Sciences; Epistemology of the Sciences of the Artificial. On topics related to these domains she wrote many articles and two books (Unità in dialogo, Bruno Mondadori, 2009; Vivre avec les robots, Seuil, 2016, with P. Dumouchel, translated into English: Living with Robots, Harvard University Press, 2017), and co-edited two journal special issues (Artificial Empathy, International Journal of Social Robotics, with P. Dumouchel and H. Lehmann; What can Synthetic Biology offer to Artificial Intelligence (and vice versa)?”, BioSystems, with Y. Kuruma and P. Stano).

12.30-14.00: Lunch break

14.00-15.30: Session 5. **Multi-Agent Systems Applications** (Chair: Cristina Baroglio)

- Matteo Baldoni, Cristina Baroglio, Federico Capuzzimati and Roberto Micalizio. Endowing Business Artifacts with a Normative Coordination Layer
- Salvatore Calcagno and Fabio La Foresta. A Radial Basis Neural Network Based Agent Module
- Paolo Fornacciari, Monica Mordonini, Agostino Poggi and Michele Tomaiuolo. Software actors for continuous social media analysis
- Giancarlo Fortino, Wilma Russo, Claudio Savaglio, Mirko Viroli and Mengchu Zhou. Modeling Opportunistic IoT Services in Open IoT Ecosystems

15.30-16.00: Coffee break

16.00-17.00: Session 6. **Industrial Applications of Agent Technology** (Chair: Giada De Simone)

- Luca Agnello, Massimo Cossentino, Giada De Simone and Luca Sabatucci. A Self-Adaptation Exemplar: the Shipboard Power System Reconfiguration Problem
- Giuseppe Barbaro, Maria Donatella Gangemi and Giandomenico Foti. An Agent-based Tsunami Alert System
- Antonello Comi, Domenico Rosaci. SMARTSAN: A P2P Social Agent Network for Generating Recommendations in a Smart City Environment
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## Saturday, 17 June

08.30-08.45: Prof. Domenico Rosaci. Presentation of *PhD School on Agents and Social Networks*.

08.45-09.45: Invited Talk. Prof. Giuseppe M.L. Sarnè. *Social Trust: Foundations and Perspectives*

### Abstract

*Social networks connect people providing them with a versatile Web environment exploitable both to share information and experiences with like-minded people and for accessing to services.*

*In such a context, social networks found their success on the level of mutual trust existing among their members.*

*Given its relevance and the overwhelming studies investigated on the social trust, this talk searches to provide a reasoned approach to the matter.*

**Giuseppe M. L. Sarnè** is assistant professor of Computer Science at the University Mediterranea of Reggio Calabria, Italy.

His research interests include distributed artificial intelligence, multi-agent systems, trust and reputation in social communities.

He has published more than 110 papers in outstanding international journals and conference proceedings.

He is Associate Editor of the international journal *Electronic Commerce Research and Application*, reviewer of a number of international journals and conferences and member of a number of conference PCs.

09.45-10.45: Invited Talk. Prof. Pasquale De Meo. *Quickly finding communities in large networks by means of edge centralities*

### Abstract

*A community within a network is a group of vertices densely connected to each other but less connected to the vertices outside. The problem of detecting communities has attracted the interest of researchers from many scientific areas like Computer Science, Biology and Sociology.*

*Most of the existing algorithms to find communities count on the topological features of the network and often do not scale well on large, real-life instances.*

*We propose a strategy to enhance existing community detection algorithms by adding a pre-processing step in which edges are weighted according to their centrality w.r.t. the network topology. The centrality of an edge reflects its contribute to making arbitrary graph traversals as quick as possible. We adopted a Monte Carlo strategy to compute edge centralities and we prove that the proposed method scales well also on large-scale networks.*

*We used our approach in combination with three state-of-the-art community detection algorithms, namely the Louvain method, COPRA and OSLOM. Experimental results show that our method raises the accuracy of existing algorithms both on synthetic and real-life datasets.*

**Pasquale De Meo** is an associate professor of computer science at the Department of Ancient and Modern Civilizations at the University of Messina, Italy. His main research interests are in the area of social networks, recommender systems, and user profiling. De Meo has a PhD in systems engineering and computer science from the University of Calabria. His PhD thesis was selected as the Best Italian PhD thesis in Artificial Intelligence by the AI\*IA. He has been the Marie Curie Fellow at Vrije Universiteit Amsterdam. He has extensively published on top Computer Science Journals like Communications of the ACM, IEEE Transactions on Knowledge and Data Engineering, ACM Transactions on Internet Technology, ACM Transactions on Intelligent Systems, IEEE Transactions on Systems, Man and Cybernetics, Information Systems.

10.45-11.00: Coffee break

11.00-12.00: Invited Talk. Ing. Fabrizio Messina. *A trust-aware, self-organizing system for large-scale federations of utility computing infrastructures.*

**Abstract.**

*On-demand distributed computing environments, like Cloud federations, consist of nodes that individually manage local resources intended to be served to clients. A client, of a broker, needing some resources, it has the problem of finding the most suitable nodes capable of providing them. In addition, a provider node may be in need to efficiently locate resources for itself, given the emerging, highly competitive, context of large-scale federations. A node may decide to publish a set of resources/ services wider than the one it has currently available, should such a node be assigned a job for which its actual resources are insufficient, it could end up requiring the collaboration of other nodes. Hence the crucial problem, for nodes and clients alike, is to determine the most promising collaborators. For this purpose, in the competitive and demanding scenarios considered, we advocate taking into account the trustworthiness of nodes in declaring their capabilities, i.e., to help it making an effective selection of possible collaborators, each node should be provided with a trust model for accurately evaluating the trustworthiness of its interlocutors. The talk will come to explain the design of a trust-based approach for large-scale federations of Utility Computing infrastructures, which allows any node to find the most suitable collaborators in an efficient way, avoiding exploration of the whole node space. The solution is based on a fully decentralized approach that allows nodes of a federation to be organized in an overlay network having a "social structure" (e.g. a small world) which is built on the basis of some criteria. This enables any customer or provider in need of collaborators to determine a suitable set of candidate nodes within which to search in an efficient way.*

**Fabrizio Messina** received his PhD in Computer Science from the Department of Mathematics and Informatics of the University of Catania, Italy in 2009. He is currently research fellow in the same department. He is author of more than 60 papers in international conferences and journals. He currently serves as Managing Editor of the International Journal of Grid and Utility Computing. His research interests include cloud and grid computing, trust and recommender systems, complex systems, simulation systems.

12.00-13.00: Tavola Rotonda: Coordinator Prof. Corrado Santoro.

VISIT TO MUSEO NAZIONALE DELLA MAGNA GRECIA