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Preface

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One of the most interesting research topics in the field of multi-agent systems is the definition of models with the aim of representing social structures such as organizations and coalitions, to control the emergent behavior of open systems. Organizations and coalitions are composed by individuals, related to each other by different possible kinds of relations such as dependencies on goals, conflicts on resources, similar beliefs and so on. One important issue is *how to represent these relations*. Moreover, like human organizations, these social structures are characterized also by a high degree of dynamism.

In dealing with societal issues, the multi-agent systems field took inspiration mostly from organizational theory in economics and legal theory, while less attention is devoted to the research area describing the relations among the individuals inside human organizations and their dynamics: *social networks analysis*. Social networks analysis has emerged as a key technique in modern sociology, anthropology, social psychology, communication studies, information science, organizational studies, economics as well as a popular topic of study. Research in a number of academic fields has shown that social networks play a critical role in determining the way problems are solved and organizations are run, and the degree to which individuals succeed in achieving their goals.

Despite the common object of study, multi-agent systems and social networks analysis use concepts like agents, dependencies, etc., which often have only superficial similarities. The aim of this special issue is to underline the differences and the similarity points between these social networks analysis and multiagent systems in the representation of the social structures and their dynamics.

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This special issue comes after the occurrence of the first three *Symposia on Social Networks and Multi-agent Systems* (SNAMAS 2009,[1] SNAMAS 2010,[2] and SNAMAS 2011[3]), whose goal was to promote the interchange of knowledge and methodologies between these two fields.

This call for papers was issued after the occurrence of the first workshop, and was open to other contributions. We have received eight submissions, and four of them were accepted for publication in this special issue.

In the first paper, called "*Trust and Relational Capital*", Rino Falcone and Cristiano Castelfranchi analyze the notion of trust as autonomous agents' relational capital. This notion may be used to establish partnerships and coalitions between them. They suggest to take into account the other agents' point of view in order to model this notion, based on several social science studies that connect trust with social capital related issues; in particular, they defend the idea that individual trust capital (relational capital) and collective trust capital not only should be disentangled, but their quite complicated and even conflicting relations should be better explained and differentiated. They propose to use trust as capital of individuals. They show how this capital is built, managed and saved, and in particular how this capital is the result of the others' beliefs and goals. Moreover, they study the cognitive dynamics of this notion of trust.

Jeremy Pitt, Moez Draief, Daniel Ramirez-Cano and Alexander Artikis coauthored the second paper, called "*Micro-Social Systems: Interleaving Agents, Norms and Social Networks*". They propose to combine aspects of norm-governed multiagent systems, information flow in social networks, and social computational choice, in order to deal with problems related to topology dynamism, conflicts, sub-ideal operation, security, and decentralized continuous management of Ad hoc networks, which may be formed by arbitrary collections of individual people, mobile routers or electronic business processes.

The third paper, "*Leaving Us in Tiers: Can Homophily be used to Generate Tiering Effects?*", is co-authored by Brian R. Hirshman, Jesse St. Charles, and Kathleen M. Carley. They propose to use a multi-agent simulation tool, called Construct, to study the phenomena of homophile: the principle that like seeks like in human networks. Their results suggest that a slight supplement to a knowledge homophily model (inclusion of several highly salient personal facts that are infrequently shared) can more successfully lead to the tiering behavior often observed in human networks than can a simplistic homophily model.

Finally, Lingzhi Lu, Nilanjan Chakraborty and Katia Sycara co-authored the last paper, called "*Modeling ethno-religious conflicts as Prisoner's Dilemma game in Graphs*". They model the multi-cultural conflict problem as a variant of the repeated PD game in graphs, where the labeled nodes correspond to the different ethnoreligious types and the topology of the graph encode the spatial distribution and interaction of the population. They present some simulation results the effect of various parameters of their model to the propensity of conflict in a population consisting of

[1] Held in AISB 2009, Edinburgh, UK, see http://snamas.di.unito.it/snamas09/ for more details.

[2] Held in AISB 2010, Leicester, UK, see http://snamas.di.unito.it/ for more details.

[3] Held in AISB 2011, York, UK, see http://snamas.2tprod.com/ for more details.

two ethno-religious groups, and compare their results to some real data of occurrence of ethno-religious violence in Yugoslavia.

We are very grateful to all of the authors who have submitted a paper for this special issue, and to our colleagues that acted as reviewers: Bruce Edmonds, Frederic Amblard, Frederico Freitas, Fredrik Liljeros, Gustavo Giménez-Lugo, Laurent Vercouter, Leon van der Torre, Luis Antunes, Magnus Boman, Michael Luck, Olivier Boissier, Pietro Terna, Rosaria Conte, Serena Villata, and Virginia Dignum. Finally, we would like to thank Kathleen M. Carley for accepting to publish this special issue in the CMOT journal.

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Guest Editors

Special issue on “Social Networks and Multi-agent Systems”