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Coordination, Organizations, Institutions, and Norms in Agent System VII

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Revised Selected Papers

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Preface

This volume is the seventh in a series that started in 2005, and contains the revised versions of 12 selected papers presented at the two COIN (Coordination, Organizations, Institutions and Norms in Agent Systems) workshops in 2011. The first took place on May 3 in Taipei, at the 11th International Conference on Autonomous Agents and Multiagent Systems (AAMAS), while the second was held on August 22 in Lyon, at the IEEE/WIC/ACM International Conference on Intelligent Agent Technology (IAT).

The papers in this collection have undergone a substantial process of refinement. As in previous editions, each submitted paper was reviewed by three Program Committee members and revised versions of the accepted papers were presented in the workshop sessions. After their presentation, some papers were selected to be part of this volume. These selected papers had to be rewritten to take into account the original reviewers' remarks and the comments sparked by the oral presentations. In the case of the papers selected from the COIN@IAT meeting, rewriting has been substantial since the original submissions were relatively short (following conference policy). All revised papers from the two workshops have undergone a second stage of review before producing the final version that is included in this volume.

In keeping with the aim of the COIN workshops, these collected papers share the basic premise of looking into coordination, organizations, institutions, and norms from a *macro* perspective. In COIN, rather than the individual features of the agents themselves, the interest resides in the collective aspects of interactions, the context where interactions take place or the regulations that affect those interactions. While this basic premise is shared, the papers contained in this volume exhibit a healthy diversity of approaches.

There are three papers whose main concern is the coordination and organization of groups of agents. The first two look into the global effect of local interactions. Inspired by ecological systems, Lurgi and Robertson in "Multi-agent coordination through mutualistic interactions" focus on how coordination and communication features among agents (in large self-organizing populations) may achieve desirable network properties. Similarly, in their paper "Explanation in human-agent teamwork," Harbers et al. explore the effects that the explanation of agent actions has on the performance of teams of agents that cooperate using a paradigmatic scenario of human-robot cooperation. The third paper by Keogh and Sonenberg, "Adaptive coordination in distributed and dynamic agent organizations," is interested in modeling the organization of groups of agents where agents not only adapt their own plans to a collective task but also improvise new plans along the way.

The papers by Jiang et al. and by Tampitsikas et al. both have an organizational perspective. Jiang et al., in “An agent-based inter-organizational collaboration framework: OperA+,” focus on features that result from the combination of organizations, and in particular (profiting from the OperA framework) how to model collaborative relationships between agents that are members of separate organizations that come together in a partnership. Tampitsikas et al., in “MANET: A model for first-class electronic institutions,” propose a framework (extending the OCeAN proposal and formalized using Event Calculus) to model systems where several electronic institutions are situated in a common environment, and where individual agents are active in more than one of these institutions.

Another group of four papers deals with norm-aware agents that reason within a regulated multi-agent system. Panagiotidi and Vázquez-Salceda describe in “Towards practical normative agents: a framework and an implementation for norm-aware planning” a conceptual framework to model practical normative agents that need to reason about norms when planning how to achieve their goals. Letia and Goron, in “Towards justifying norm compliance,” propose including the notion of “justification” in normative multiagent systems and use a justification logic and value-based argumentation to that effect. Balke et al. discuss in “Normative run-time reasoning for institutionally-situated BDI agents” a methodology to produce run-time reasoning components for BDI agents starting from a design-time institutional model. Finally, Cranefield et al. demonstrate in “Modelling and monitoring interdependent expectations” the benefits of having “expectations” as a first-class construct in normative multiagent systems and show how to use a temporal logic with expectations and a model checker to handle problematic cases of nested expectations.

Finally, there is a fourth group of papers whose focus is on the process for norm creation and enforcement. In “Operationalization of the Sanctioning Process in Utilitarian Artificial Societies,” Balke and Villatoro look into the processes involved in the life-cycle of normative MAS and, in particular, discuss the process of punishment from two perspectives: as a device for norm compliance, and as a device for norm enforcement. Two papers by Mahmoud et al. also look into metanorms in general and punishment in particular, but in the context of norm emergence. While in “Overcoming omniscience for norm emergence in Axelrod’s metanorm model” they focus on the way agents learn how to punish, in “Establishing norms for network topologies” they explore the effects of the topology of communication links among agents.

COIN strives to fulfill its workshop role of stimulating discussion, facilitating convergence and synergy of approaches, and weaving a community. Authors and reviewers were encouraged to contribute to a workshop program that welcomes the presentation of unconventional approaches—perhaps stemming from other disciplines—as well as reports about ongoing work, and testimonials of the application of the ideas of this community. The papers in this collection correspond to that invitation.

In terms of their main contribution, this year's papers may be partitioned in three groups: Five papers aim to explore or demonstrate a novel idea (Cranefield et al., Harbers et al., Letia and Goron, and both papers by Mahmoud et al.). Two papers (Balke and Villatoro, and Lurgi and Robertson) propose a new approach; and five papers (Keogh and Sonenberg, Tampitsikas et al., Panagiotidi and Vázquez-Salceda, Jiang et al., and Balke et al.) present a modeling framework.

The papers reflect a diverse pool of influences: modal logics of different flavors (Panagiotidi and Vázquez-Salceda, Cranefield et al., and Letia and Goron), answer set programming (Balke et al.), event calculus (Tampitsikas et al.), argumentation theory (Letia and Goron), normative programming languages (Cranefield et al., Panagiotidi and Vázquez-Salceda, Balke et al., and Lurgi and Robertson), planning (Panagiotidi and Vázquez-Salceda), learning (Mahmoud et al.), complex systems and networks (Lurgi and Robertson, and Mahmoud et al.), experimental economics (Mahmoud et al.), legal theory (Balke and Villatoro), ecology (Lurgi and Robertson), management science (Harbers et al., and Keogh and Sonenberg), and software engineering and sociotechnical systems design (Tampitsikas et al., Keogh and Sonenberg, Jiang et al., Balke et al., and Harbers et al.).

Surprisingly, all but two papers that appear in this collection claim to be motivated, to some extent, by practical considerations. Perhaps future COIN workshops may have papers that analyze the type of applications, problem domains, examples, and illustrative scenarios that are used in this community. Those that are used or explicitly mentioned in this volume are: health care, peer-to-peer computing (file sharing, wireless sensor networks, and wireless grids), traffic management, robotic search, the blocks world for teams, auctions, and running a collaborative project.

Three papers provide methodological guidelines (Balke et al., Jiang et al., and Keogh and Sonenberg). Four papers (Lurgi and Robertson, Balke et al., and both papers by Mahmoud et al.) use some sort of experimental validation or agent-based simulation to back their results, and all but one refer to some sort of implementation of the ideas presented in the paper.

We would like to end this brief preface with two notes. One of gratitude, the other of sorrow. We four, first as workshop chairs and then as editors of this volume, want to express our sincere gratitude to the reviewers of the COIN 2011 editions. Everyone knows that reviewing is not an easy task: it demands generosity—to allocate time and energy that is taken away from other duties; good sense and optimism—to provide constructive criticism; plus a balanced use of confidence, altruism, and courage—to recommend the acceptance or rejection of papers. The names of this year's program committee members are listed for everyone to see in the front matter of this volume, but their contribution is subtly present in the many suggestions that were taken up by the authors to enrich the final version of their papers. Sadly, though, one of these PC members is no longer with us. Marc Esteva passed away last December. He had been a very active member of the COIN community. He wrote a thesis on electronic institutions

and was the engineer behind the EIDE platform for their specification and implementation. At the time of his unexpected death he was directing two PhD students working on COIN topics (immersive regulated environments and the evolution of situated and service-rich electronic institutions), and was the head researcher in a Spanish project in this field. We will remember him in COIN not just because he had been a reviewer in most of the editions and a contributing author to many, but also because he was an enthusiastic participant in the workshop debates. To those of us who had the privilege of knowing him more closely, recalling his many personal qualities will somehow compensate for the weight of his loss.

July 2012

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