

Preface

This volume comprises the joint proceedings of two workshops that were hosted in conjunction with the International Conference on Autonomous Agents and Multiagent Systems (AAMAS 2015)¹: the 6th International Workshop on Collaborative Agents Research and Development (CARE 2015)² and the Second International Workshop on Multiagent Foundations of Social Computing (MFSC 2015)³. The events took place on May 4, 2015, in Istanbul, Turkey.

Both events promoted discussions around the state-of-the-art research and application of multiagent system technology. CARE and MFSC addressed issues in relevant areas of social computing such as smart societies, social applications, urban intelligence, intelligent mobile services, models of teamwork and collaboration, as well as many other related areas. The workshops received contributions ranging from top-down experimental approaches and a bottom-up evolution of formal models and computational methods. The research and development discussed is a basis of innovative technologies that allow for intelligent applications, collaborative services, and methods to better understand societal interactions and challenges.

The theme of the “CARE for Social Apps and Ubiquitous Computing” workshop focused on computational models of social computing. Social apps aim to promote social connectedness, user friendliness through natural interfaces, contextualization, personalization, and “invisible computing.” A key question was on how to construct agent-based models that better perform in a given environment. The discussion revolved around the application of agent technology to promote the next generation of social apps and ubiquitous computing, with scenarios related to ambient intelligence, urban intelligence, classification and regulation of social behavior, and collaborative tasks.

The “Multiagent Foundations of Social Computing” workshop focused on multiagent approaches around the conceptual understanding of social computing, e.g., relating to its conceptual bases, information and abstractions, design principles, and platforms. The discussion was around models of social interaction, collective agency, argumentation information models and data analytics for social computing, and related areas.

The workshops promoted international discussion forums with submissions from different regions and Program Committee members from many counters in Europe (The Netherlands, Greece, France, Luxembourg, Sweden, Spain, UK, Ireland, Italy, Portugal), Asia (Turkey, Singapore), Oceania (Australia, New Zealand), and the Americas (Brazil, Colombia, USA). The CARE 2015 workshop received 14 papers submitted through the workshop website from which we selected five papers for publication, all

¹ <http://www.aamas2015.com/>

² <http://www.care-workshops.org/>

³ <http://www.lancaster.ac.uk/staff/chopraak/mfsc-2015/>

being republished as extended versions in this volume. MFSC 2015 selected seven papers for publication, all being promoted as extended versions.

The papers selected for this volume are representative research projects around the aforementioned methods. The selections highlight the innovation and contribution to the state of the art, suggesting solutions to real-world problems as applications built on the proposed technology.

In the first paper, “Automated Negotiation for Traffic Regulation,” Garciarz et al. propose a mechanism based on coordination to regulate traffic at an intersection. This approach is distributed and based on automated negotiation. Such technology would allow us to replace classic traffic-light intersections in order to perform a more efficient regulation by taking into account various kinds of information related to traffic or vehicles, and by encouraging cooperation.

The second paper, “Towards a Middleware for Context-Aware Health Monitoring,” by Oliveira et al., introduces a new model to correlate mobile sensor data, health parameters, and situational and/or social environment. The model works by combining environmental monitoring, personal data collecting, and predictive analytics. The paper presents a middleware called “Device Nimbus” that provides the structures with which to integrate data from sensors in existing mobile computing technology. Moreover, it includes the algorithms for context inference and recommendation support. This development leads to innovative solutions in continuous health monitoring, based on recommendations contextualized in the situation and social environment.

The third paper, “The Influence of Users’ Personality on the Perception of Intelligent Virtual Agents Personality and the Trust Within a Collaborative Context,” by Hanna and Richards, explores how personality and trust influence collaboration between humans and human-like intelligent virtual agents (IVAs). The potential use of IVAs as team members, mentors, or assistants in a wide range of training, motivation, and support situations relies on understanding the nature and factors that influence human–IVA collaboration. The paper presents an empirical study that investigated whether human users can perceive the intended personality of an IVA through verbal and/or non-verbal communication, on one hand, and the influence of the users’ own personality on their perception, on the other hand.

The fourth paper, “The Effects of Temperament and Team Formation Mechanism on Collaborative Learning of Knowledge and Skill in Short-Term Projects,” by Farhangian et al., introduces a multi-agent model and tool that simulates team behavior in virtual learning environments. The paper describes the design and implementation of a simulation model that incorporates personality temperaments of learners and also has a focus on the distinction between knowledge learning and skill learning, which is not included in existing models of collaborative learning. This model can be significant in helping managers, researchers, and teachers to investigate the effect of group formation on collaborative learning and team performance. Simulations built upon this model allow researchers to gain better insights into the impact of an individual learner’s attributes on team performance.

The fifth paper, “Exploring Smart Environments Through Human Computation for Enhancing Blind,” by Paredes et al., presents a method for the orchestration of wearable sensors with human computation to provide map metadata for blind navigation. The research has been motivated by the need for innovation toward navigation

aids for the blind, which must provide accurate information about the environment and select the best path to reach a chosen destination. The dynamism of smart cities promotes constant change and therefore a potentially dangerous territory for these users. The paper proposes a modular architecture that interacts with environmental sensors to gather information and process the acquired data with advanced algorithms empowered by human computation. The gathered metadata enables the creation of “happy maps” to provide orientation to blind users.

In the sixth paper, “Incorporating Mitigating Circumstances into Reputation Assessment,” Miles and Griffiths present a reputation assessment method based on querying detailed records of service provision, using patterns that describe the circumstances to determine the relevance of past interactions. Employing a standard provenance model for describing these circumstances, it gives a practical means for agents to model, record, and query the past. The paper introduces a provenance-based approach, with accompanying architecture, to reputation assessment informed by rich information on past service provision; query pattern definitions that characterize common mitigating circumstances; and an extension of an existing reputation assessment algorithm that takes account of this richer information.

In the seventh paper, “Agent Protocols for Social Computation,” Rovatsos et al. propose a data-driven method for defining and deploying agent interaction protocols that is based on using the standard architecture of the World Wide Web. The paper is motivated by the fact that social computation systems involve interaction mechanisms that closely resemble well-known models of agent coordination; current applications in this area make little or no use of agent-based systems. The proposal contributes with message-passing mechanisms and agent platforms, thereby facilitating the use of agent coordination principles in standard Web-based applications. The paper describes a prototypical implementation of the architecture and experimental results that prove it can deliver the scalability and robustness required of modern social computation applications while maintaining the expressiveness and versatility of agent interaction protocols.

The eighth paper, “Negotiating Privacy Constraints in Online Social Networks,” by Mester et al., proposes an agreement platform for privacy protection in Online Social Networks where privacy violations that take place result in users’ concern. The research proposes a multiagent-based approach where an agent represents a user. Each agent keeps track of its user’s preferences semantically and reasons on privacy concerns effectively. The proposed platform provides the mechanisms with which to automatically settle differences in the privacy expectations of the users.

The ninth paper, “Agent-Based Modeling of Resource Allocation in Software Projects Based on Personality and Skill,” by Farhangian et al., presents a simulation model for assigning people to a set of given tasks. This model incorporates the personality and skill of employees in conjunction with the task attributes such as their dynamism level. The research seeks a comprehensive model that covers all the factors that are involved in the task allocation systems such as teamwork factors and the environment. The proposal aims to provide insights for managers and researchers, to investigate the effectiveness of (a) selected task allocation strategies and (b) of employees and tasks with different attributes when the environment and task requirements are dynamic.

In the tenth paper, “On Formalizing Opportunism Based on Situation Calculus,” Lou et al. propose formal models of opportunism, which consist of the properties knowledge asymmetry, value opposition, and intention, based on situation calculus in different context settings. The research aims to formalize opportunism in order to better understand the elements in the definition and how they constitute this social behavior. The proposed models can be applied to the investigation of on behaviour emergence and constraint mechanism, rendering this study relevant for research around multiagent simulation.

In the next paper, “Programming JADE and Jason Agents Based on Social Relationships Using a Uniform Approach,” Baldoni et al. propose to explicitly represent agent coordination patterns in terms of normatively defined social relationships, and to ground this normative characterization on commitments and on commitment-based interaction protocols. The proposal is put into effect by the 2COMM framework. Adapters were developed for allowing the use of 2COMM with the JADE and the JaCaMo platforms. The paper describes how agents can be implemented in both platforms by relying on a common programming schema, despite them being implemented in Java and in the declarative agent language Jason, respectively.

Finally, the paper “The Emergence of Norms via Contextual Agreements in Open Societies,” by Vouros, proposes two social, distributed reinforcement learning methods for agents to compute society-wide agreed conventions concerning the use of common resources to perform joint tasks. The computation of conventions is done via reaching agreements in agents’ social context, via interactions with acquaintances playing their roles. The formulated methods support agents to play multiple roles simultaneously; even roles with incompatible requirements and different preferences on the use of resources. The work considers open agent societies where agents do not share common representations of the world. This necessitates the computation of semantic agreements (i.e., agreements on the meaning of terms representing resources), which is addressed by the computation of emergent conventions in an intertwined manner. Experimental results show the efficiency of both social learning methods, even if all agents in the society are required to reach agreements, despite the complexity of the problem scenario.

We would like to thank all the volunteers who made the workshops possible by helping in the organization and in peer reviewing the submissions.

August 2015

Fernando Koch
Christian Guttmann
Didac Busquets

Advances in Social Computing and Multiagent Systems
6th International Workshop on Collaborative Agents
Research and Development, CARE 2015 and Second
International Workshop on Multiagent Foundations of
Social Computing, MFSC 2015, Istanbul, Turkey, May 4,
2015, Revised Selected Papers
Koch, F.; Guttman, C.; Busquets, D. (Eds.)
2015, XII, 203 p. 40 illus. in color., Softcover
ISBN: 978-3-319-24803-5