



VALÉRIE CAMPS

Introduction

Volume 5, n° 1 (2024), p. 5-7.

<https://doi.org/10.5802/roia.68en>

© Les auteurs, 2024.



Cet article est diffusé sous la licence
CREATIVE COMMONS ATTRIBUTION 4.0 INTERNATIONAL LICENSE.
<http://creativecommons.org/licenses/by/4.0/>



*La Revue Ouverte d'Intelligence Artificielle est membre du
Centre Mersenne pour l'édition scientifique ouverte*
www.centre-mersenne.org
e-ISSN : 2967-9672

Introduction

Valérie Camps^a

^a Université Toulouse III – Paul Sabatier, Laboratoire IRIT, 118 route de Narbonne,
31062 Toulouse cedex 9
E-mail: Valerie.Camps@irit.fr.

The Journées Francophones sur les Systèmes Multi-Agents (JFSMA) are the annual meeting of the French-speaking community of researchers working in the field of Multi-Agent Systems (MAS). The multi-agent paradigm is particularly relevant to the study and design of systems whose overall dynamics are the result of interactions between autonomous entities, called *agents*. These agents can be distributed and heterogeneous. They have partial, distributed functionalities as well as local perceptions of their surroundings, and interact in an open and possibly evolving environment. Multi-agent systems enable the development of complex systems by exploiting the properties of the agents that make them up, such as autonomy (the agent makes its own decisions without the intervention of a third party), sociability (it interacts with agents located in its neighbourhood) and proactivity (an agent can be led to take initiatives). This means that a complex problem is not considered to be managed by a single entity (centralized system), but rather by several entities (distributed system), each with its own objective and interacting with its neighbors.

Traditionally, each edition of the JFSMA highlights a specific theme. The theme of JFSMA'22 was “*SMA and Smart Cities*”. The smart city has its origins in the concept of “*smarter city*”, introduced by IBM in 2008 when the world was facing one of the biggest economic crises. During this period of recession, IBM sought to identify new markets to boost its profits, and identified cities as a potential market, associating them with information and communication technologies. The concept then caught the imagination of several countries, leading to a certain popularity and, above all a growing use of the “Smart City” concept. Although there have been many definitions of the “smart city” since then, there is no real consensus on any definition. The CNIL defines the smart city⁽¹⁾ as “a new concept of urban development to improve the quality of life of city dwellers by making the city more adaptive and efficient, using new technologies based on an ecosystem of objects and services”. The smart city can therefore be seen as a complex eco-system involving a very large number of interacting entities (objects, services, humans, etc.) working collectively for an inclusive city, for the ecological transition and therefore energy, for innovative mobility and for citizens' quality of life, notably through the design of innovative services.

⁽¹⁾<https://www.cnil.fr/fr/definition/smart-city>

The contributions encouraged during this edition of JFSMA'22 were, therefore, those in which autonomous software or hardware agents, plunged into dynamic, partially accessible and indeterministic environments, interact and cooperate to provide solutions to improve the quality of life, the ecological transition as well as mobility and transport. In particular, the aim was to study certain problems induced by the application framework of smart cities, namely the problems of optimization, interoperability, management of massive and heterogeneous data, temporality, scaling up, openness... but also to discuss new solutions based on multi-agent models, multi-agent simulations, collective problem solving, user assistance...

This book contains three extended versions of the best papers selected and presented at the thirtieth edition of JFSMA'22. The reader will also find two other contributions based on the multi-agent paradigm and particularly relevant to the “SMA and Smart Cities” theme.

Josselin Guéron and Grégory Bonnet, in their article entitled “*A protocol of monotonic concessions for the distributed formation of coalitions*”, focus on the formation of coalitions by agents (in order to jointly perform tasks that cannot be handled individually), according to different concession strategies in a distributed approach. As the authors illustrate, coalition formation can be considered in the field of smart grids for resource sharing within microgrids, as well as within supply chains for the formation of producer alliances. This paper presents a distributed protocol for coalition formation, based on a monotonic negotiation protocol for which new concession strategies have been proposed. The experiments carried out to evaluate the proposed protocol compare different concession types and strategies through random game generations, with homogeneous agents in terms of strategies and types of concession. Two types of evaluation were carried out: one on a small scale for comparison with optimal results, and one on a larger scale to assess the proposed protocol.

The work of Tristan de Blauwe *et al.* is set in the context of the development of autonomous agents for vocational training. Their article, entitled “*OPACK: an integrative agent model for the generation of behaviors induced by modular cognitive models*” presents the OPACK model whose objective is to enable the integration of several cognitive models (emotional, etc.) within any agent model, with a minimum of assumptions about the agent model and the cognitive model, while ensuring that the behaviors produced remain representative, model-sensitive and intelligible. An agent is defined in a modular way, using basic operations that define the agent model and a set of cognitive processes that complement or modify these operations. The evaluation of OPACK focused on two aspects. The sensitivity of the cognitive models on the agent's behavior was evaluated using an experiment that measures the actions selected by the agent model according to three cognitive models. The representativeness and intelligibility of the behaviors produced were evaluated using a perceptual study on a scenario imagined in an emergency medicine context.

In their article entitled “*Estimating environmental information with the HybridIoT system: a case study of the city of Toulouse*”, Davide Andrea Guastella *et al.* present the HybridIoT system whose objective is to enable the estimation of missing environmental

information in local parts of the environment that are not sufficiently instrumented by sensors, to limit the costs generated by the installation and maintenance of additional sensors. Three estimation methods are proposed, depending on whether or not sensors of the same type as the value to be estimated exist in the vicinity of the point where the estimation is to be made. HybridIoT was evaluated on a meteorological dataset acquired from sensors deployed in the city of Toulouse and compared with regression techniques proposed by the KNIME platform. HybridIoT was being deployed in a real context, the campus of the University of Toulouse III – Paul Sabatier, which, due to its characteristics, can be compared to a small town.

*** *“Agent-centered approach for intermodality based on real data”* by A. O Diallo *et al.*

*** *“Confidence in the information transmitted in a sequence of agents”* by Robert Demolombe

This book is the result of the work of many people, including the members of the JFSMA’22 program committee, whom we thank for their work in evaluating and shortlisting the best papers proposed for this special issue, as well as for their work in reviewing the extended versions. We would also like to thank the members of the ROIA editorial board who participated in the process of evaluating and reviewing the extended versions of the best JFSMA’22 papers submitted for this special issue. Our thanks are therefore particularly addressed to:

- Emmanuel Adam (LAMIH, Université Polytechnique Hauts-De-France, France).
- Olivier Boissier (LIMOS, École des Mines de Saint-Etienne, France).
- Rémy Courdier (LIM, Université de la Réunion, France).
- Guillaume Hutzler (IBISC, Université Evry-Paris Saclay, France).
- René Mandiau (LAMIH, Université Polytechnique Hauts-De-France, France).
- Antoine Nongaillard (CRISTAL, Université de Lille, France).
- Michel Ocelllo (LCIS, Université Grenoble Alpes, France).
- Alexandre Pauchet (LITIS, INSA Rouen Normandie, France).
- Valérie Renault (CREN, Le Mans Université, France).
- Olivier Simonin (CITI, INSA de Lyon, France).
- Laurent Vercouter (LITIS, INSA Rouen Normandie, France).
- Mahdi Zargayouna (GRETTIA, Université Gustave Eiffel, France).

We would also like to thank everyone involved in the editing process of this special issue, in particular Pascale Kuntz, editor-in-chief of the ROIA journal.

Last but not least, we would particularly like to thank all the people who have been involved in the JFSMA for over 30 years, notably through their writings, their presentations and their rich and fruitful exchanges during this annual meeting.