

# Preface

The engineering of multi-agent systems (MAS) is a multi-faceted, complex task. These systems consist of multiple, autonomous, and heterogeneous agents, and their global behavior emerges from the cooperation and interactions among the agents. MAS have been widely studied and implemented in academia, but their full adoption in industry is still hampered by the unavailability of comprehensive solutions for conceiving, engineering, and implementing these systems.

Being at the border between software engineering and artificial intelligence, they can benefit from both disciplines, but at the same time they lack proper mainstream solutions. For example, even if the artificial intelligence side has been proposing conceptual models for years, there is still a lack of proper abstractions unanimously recognized as effective design solutions for the conceptions of agents and of their interactions. Similarly, there is still a significant gap between the availability of “standard” software engineering implementation and validation solutions and their adoption in the conception of MAS. More recently, the emergence of self-adaptive software systems, and in general the idea of software systems that can change their behavior at runtime, has imposed MAS as one conceptual solution for their realization, but it has also emphasized the need for proper and sound engineering solutions. Conversely, design artifacts (e.g., agent or MAS models) can be also used to support and assist the testing and debugging of conventional software, while the use of agent-oriented programming languages results in programs that are more readily verifiable. Their many pieces belong to the same puzzle, but significant work is still needed to put them together.

As said, many solutions have already been proposed. They address the use of common software engineering solutions for the conception of MAS, the use of MAS for ameliorating common software engineering tasks, and also the proper blending of the two disciplines to conceive MAS-centric development processes. Academia has been working on ideas and solutions; industry should have exploited them to improve the state of the art. The cross-fertilization is needed to make the two sides of the same coin cooperate, and a single, common venue can help to exchange ideas, compare solutions, and learn from one another.

The International Workshop on Engineering Multi-Agent Systems (EMAS) aims to be this comprehensive venue, where software engineering and artificial intelligence researchers can meet together and discuss the different viewpoints and findings, and where they can also try to present them to industry. EMAS was created in 2013 as a merger of three separate workshops (with overlapping communities) that focused on the software engineering aspects (AOSE), the programming aspects (ProMAS), and the application of declarative techniques to design, program, and verify (DALTE) MAS. The workshop is traditionally co-located with AAMAS (International Conference on Autonomous Agents and Multi-agent Systems) and thus this year it was held in Istanbul (Turkey).

This year the workshop was a single-day event. We received 19 submissions, and after a double review process, 10 papers were selected for inclusion in this volume. All the contributions were revised by taking into account the comments and discussions at the workshop. Moreover, the volume includes two papers by the invited speakers, Brian Logan, from the University of Nottingham, and Mirko Viroli, from Università di Bologna, whose presentations raised a lot of interest and compelling discussions.

We would like to thank all the members of the Program Committee for their excellent work. Moreover, we would like to thank all the members of the Steering Committee of EMAS for their valuable suggestions and support.

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