Preface to the Special Issue on Advances in Argumentation in Artificial Intelligence

Now at the forefront of automated reasoning, argumentation has become a key research topic within Artificial Intelligence. It involves the investigation of those activities for the production and exchange of arguments, where arguments are attempts to persuade someone of something by giving reasons for accepting a particular conclusion or claim as evident. The study of argumentation has been the focus of attention of philosophers and scholars, from Aristotle and classical rhetoric to the present day. The computational study of arguments has emerged as a field of research in AI in the last two decades, mainly fuelled by the interest from scholars in logics, non-monotonic and epistemic reasoning, and in related disciplines such as Law, Sociology and Computational Linguistics.

This special issue collects a selection of five papers from the 2nd Workshop on Advances In Argumentation In Artificial Intelligence, co-located with AI*IA 2018, the 17th International Conference of the Italian Association for Artificial Intelligence held in Trento in November 2018. The workshop was organized as part of the activities of the Argumentation in Artificial Intelligence Working Group. The Argumentation Group is a working group of the Associazione Italiana per l'Intelligenza Artificiale (AI*IA) whose general goal is to promote Italian scientific activities in the field of Argumentation in Artificial Intelligence, and foster collaborations between research groups. The selected papers discuss theoretical foundations in argumentation as well as challenges and real-world problems for which argumentation may represent a viable AI-paradigm. Each submission underwent a single-blind peer-review process and the five accepted articles were reviewed by at least two independent expert reviewers.

Much work in computational models of argument is centered on Dung' seminal 1995 paper "*On the acceptability of arguments and its fundamental role in nonmonotonic reasoning, logic programming and n-person games.*". On the one hand, this is reflected by the papers presented in this special issue, with four out of five papers describing works directly linked to Dung's abstract framework or to its extensions. On the other hand, the papers also testify the variety and richness of the current state-of-the-art of argumentation studies, which extends and goes far beyond Dung's work, proposing research combining natural language processing and probabilistic reasoning with abstract argumentation

The papers by Flesca, Dondio and Longo, and Taticchi and Bistarelli are theoretical works in the area of computational argumentation. The paper by Flesca examines the problem of efficiently computing the probability of the extensions of bipolar probabilistic argumentation frameworks, proposing a set of more efficient and empirically-tested algorithms. The paper by Dondio and Longo introduces a novel abstract argumentation semantics. Inspired by the ambiguity blocking semantics of defeasible logic, the authors propose a semantics where the undecided label assigned to some arguments could be blocked instead of being propagated to attacked arguments. The paper by Taticchi and Bistarelli proposes a cooperative-game approach to share acceptability and rank arguments of an argumentation framework. The paper by Gobbo et al. proposes a new method for annotating arguments expressed in natural language, called adpositional argumentation. By doing so, they provide the guidelines for designing a gold standard corpus that could benefit studies in argumentation mining and arguments definition.

The paper by Pazienza et al. proposes an interesting application of abstract argumentation to financial predictions. The authors design a framework combining natural language processing along with abstract argumentation techniques to automatically extract

relevant arguments from Earning Conference Call transcripts, weight such arguments and produce a final advice aimed to anticipate and predict analysts' recommendations.

Finally, the Editors are like to acknowledge the work of the members of the Programme Committee whose invaluable expertise and efforts have led to the selection of the papers included in this special issue. Last but not least, the editors would like to thank all the authors that have contributed to this special issue.

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Accepted Papers:

Dondio, Longo,
Beyond Reasonable Doubt: a Proposal for Undecidedness Blocking in Abstract Argumentation

Taticchi, Bistarelli,
Power Index-Based Semantics for Ranking Arguments in Abstract Argumentation Frameworks

Gobbo, Benini, Wagemans,
Annotation with Adpositional Argumentation: Guidelines for building a Gold Standard Corpus of argumentative discourse

Pazienza, Grossi, Grasso, Palmieri, Zito, Ferilli,
An Abstract Argumentation Approach for the Prediction of Analysts' Recommendations following Earnings Conference Calls

Flesca,
Efficiently computing extensions' probabilities over probabilistic Bipolar Abstract Argumentation Frameworks