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Preface for the special issue on argument strength

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Arguments may vary in strength. The strength of an argument is influenced by different factors like the plausibility of its premises or the nature of the link between its premises and conclusion. The workshop series on argument strength[1] has the goal to gather researchers to study different questions such as the factors that influence the strength of an argument, different formal representations of argument strength, propagation of argument strength with respect to sub-arguments, strength in the context of argument accrual, the link between argument strength and argument specificity, the link between formal and informal approaches to argument strength, and how the preferences on premises influence the evaluation of arguments.

The workshop series on argument strength was initiated in 2016, when the first workshop was held in 2016 at Ruhr-University Bochum (Germany). Selected papers of the first workshop were published in a special issue of the Journal of Applied Logics – IfCoLog Journal, Volume 5 Number 3, 2018 [2]. The second edition of the workshop was organized in 2018 in Toulouse (France). A special issue containing selected papers of this second workshop was published in a special issue of the journal of Argument and Computation, Volume 12 Number 1, 2021 [4].

The third edition was initially planned to be held in Hagen, Germany in 2020, but due to the Covid-19 worldwide pandemic, was eventually held fully virtual on October 11-13, 2021. There were 18 workshop submissions, which were all accepted and presented at the workshop. There were 101 registered participants which resulted in a lively workshop. The talks were recorded and can be viewed online.[2] This special issue contains extended versions of selected papers from the third workshop on argument strength, containing papers submitted on the basis of an open call for papers.

We now provide an overview of the contributions in this special issue.

Gustavo Bodanza and Esteban Freidin report on experiments on people's assessment of argument strength, and compare the results of this experiments with the formalism of value-based argumentation frameworks. Value-based argumentation frameworks [1] model argument strength by associating a set

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[1] http://argstrength2021.argumentationcompetition.org
[2] https://argstrength2021.argumentationcompetition.org/programme.html

of values with arguments in a formal argumentation framework, and allowing different audiences to have different preferences over these values. The experiments both allow to evaluate the descriptive adequacy of VAFs and to obtain data for improving VAFs as a normative theory. The main results of the experiments show a discrepancy between semantics for VAFs and the reported acceptance of arguments.

Paola Daniela Budan, Melisa Gisselle Esañuela González, Maximiliano Celmo David Budan, Maria Vanina Martínez and Guillermo Ricardo Simari investigate how to detect and analyse communities in discussion on social media on the web using bipolar argumentation [3]. In more detail, they detect communities on the basis of their supported opinions and use similarity-based evaluation methods over the set of arguments to determine levels of cohesion within such communities. They then define meta-argumentation frameworks where the sets of arguments of coalitions are used as arguments and where a strength is assigned to these (meta-)arguments on the basis of the (object-level) arguments in the coalition. Various ways of considering the strength of attacks are formalized in different semantics for such meta-frameworks. The formalism is illustrated using a case study on climate change.

Nir Oren and Bruno Yun analyze how to infer attack relations for gradual semantics. Gradual argumentation semantics assign gradual acceptability degrees to arguments given an abstract argumentation framework where initial weights are assigned to every argument. The research question answered in their paper is whether and how attack relations can be inferred given a set of arguments, their initial weights, and the gradual acceptability degrees assigned to these arguments. Complexity results for this problem are provided for several gradual semantics and constructive methods for finding solutions to this problem are given.

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