

CALL FOR PAPERS

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FOURTH WORKSHOP ON:
BRIDGING THE GAP BETWEEN HUMAN AND AUTOMATED REASONING
AN FAIM WORKSHOP (SUPPORTED BY IFIP TC12)
STOCKHOLM, SWEDEN

Reasoning is a core ability in human cognition. Its power lies in the ability to theorize about the environment, to make implicit knowledge explicit, to generalize given knowledge and to gain new insights. There are a lot of findings in cognitive science research which are based on experimental data about reasoning tasks, among others models for the Wason selection task or the suppression task discussed by Byrne and others. This research is supported also by brain researchers, who aim at localizing reasoning processes within the brain.

Early work often used propositional logic as a normative framework. Any deviation from it has been considered an error. Central results like findings from the Wason selection task or the suppression task inspired a shift from propositional logic and the assumption of monotonicity in human reasoning towards other reasoning approaches. This includes but is not limited to models using probabilistic approaches, mental models, or non-monotonic logics. Considering cognitive theories for syllogistic reasoning show that none of the existing theories is close to the existing data. But some formally inspired cognitive complexity measures can predict human reasoning difficulty for instance in spatial relational reasoning.

Automated deduction, on the other hand, is mainly focusing on the automated proof search in logical calculi. And indeed there is tremendous success during the last decades. Recently a coupling of the areas of cognitive science and automated reasoning is addressed in several approaches. For example there is increasing interest in modeling human reasoning within automated reasoning systems including modeling with answer set programming, deontic logic or abductive logic programming. There are also various approaches within AI research for common sense reasoning and in the meantime there even exist benchmarks for commonsense reasoning, like the Winograd and the COPA challenge.

Despite a common research interest – reasoning – there are still several milestones necessary to foster a better inter-disciplinary research. First, to develop a better understanding of methods, techniques, and approaches applied in both research fields. Second, to have a synopsis of the relevant state-of-the-art in both research directions. Third, to combine methods and techniques from both fields and find synergies. E.g., techniques and methods from computational logic have never been directly applied to model adequately human reasoning. They have always been adapted and changed. Fourth, we need more and better experimental data that can be used as a benchmark system. Fifth, cognitive theories can benefit

from a computational modeling. Hence, both fields – human and automated reasoning – can both contribute to these milestones and are in fact a *conditio sine qua non*. Achievements in both fields can inform the others. Deviations between fields can inspire to seek a new and profound understanding of the nature of reasoning.

This is the fourth workshop in a series of successful *Bridging the Gap Between Human and Automated Reasoning* workshop.

Topics of interest include, but are not limited to the following:

- benchmark problems relevant in both fields
- approaches to tackle Benchmark problems like the Winograd Schema Challenge or the COPA challenge
- limits and differences between automated and human reasoning
- psychology of deduction and common sense reasoning,
- logics modeling human reasoning
- non-monotonic, defeasible, and classical reasoning

The workshop part of the FAIM workshop program located at the Federated Artificial Intelligence Meeting (FAIM) which includes the major conferences IJCAI-ECAI, ICML, AAMAS, ICCBR and SoCS. The Bridging workshop is supported by IFIP TC12.

IMPORTANT DATES

Full Paper submission deadline:	25th of April, 2018
Notification:	3rd of June, 2018
Final submission:	17th of June, 2018
Workshop:	July 2018

SUBMISSION AND CONTRIBUTION FORMAT

Papers, including the description of work in progress are welcome and should be formatted according to IJCAI guidelines. The length should not exceed 6 pages excluding references. All papers must be submitted in PDF. Formatting instructions and the style files can be obtained http://www.ijcai.org/authors_kit. The EasyChair submission site is available at: <https://easychair.org/conferences/?conf=bridging2018>

PROCEEDINGS

Proceedings of the workshop will be published as CEUR workshop proceedings.

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