Preface

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. 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.

Automated deduction, on the other hand, is mainly focusing on the automated proof search in logical calculi. 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.

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. 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 contribute to these milestones and are in fact a conditio sine qua non.

The goal of this workshop is to bring together leading researchers from artificial intelligence, automated deduction, computational logics and the psychology of reasoning that are interested in a computational foundations of human reasoning – both as speakers and as audience members. Its ultimate goal is to share knowledge, discuss open research questions, and inspire new paths.

In this years edition of the workshop, six papers have been accepted for presentation. The papers present the following strands: cognitive models, logic programming approaches to model human reasoning; syllogistic reasoning; computational models for human reasoning. Apart from the accepted papers, the workshop program included two keynote presentations: In his talk on *Ethical Decision Making under the Weak Completion Semantics*, Steffen Hölldobler illustrated how weak completion semantics extended with equality can be used to decide questions about the moral permissibility of actions. In his talk on *Spatial Coherence: Why linear formalisms do not capture the essence of space*, Christian Freksa demonstrated the role of simultaneously acting spatial relations in 2- and 3-dimensional spatial substrates for spatial problem solving.

Finally, the Bridging-18 organizers seize the opportunity to thank the Program Committee members for their most valuable comments on the submissions, the authors for inspiring papers, the audience for their interest in this workshop, and the organizers of the FAIM workshop program and the IJCAI-ECAI-18 for their support.

October, 2018 Claudia Schon
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