

# Preface

## Aims and Scope of the Workshop

Information for real life AI applications is usually pervaded by uncertainty and subject to change, and thus demands for nonclassical reasoning approaches. At the same time, psychological findings indicate that human reasoning cannot be completely described by classical logical systems. Sources of explanations are incomplete knowledge, incorrect beliefs, or inconsistencies. A wide range of reasoning mechanism has to be considered, such as analogical or defeasible reasoning, possibly in combination with machine learning methods. The field of knowledge representation and reasoning offers a rich palette of methods for uncertain reasoning both to describe human reasoning and to model AI approaches.

The aim of this series of workshops is to address recent challenges and to present novel approaches to uncertain reasoning and belief change in their broad senses, and in particular provide a forum for research work linking different paradigms of reasoning. This year we welcomed especially contributions on intersections between human and formal aspects such as computational thinking. A special focus is on papers that provide a base for connecting formal-logical models of knowledge representation and cognitive models of reasoning and learning, addressing formal and experimental or heuristic issues. Previous events of the Workshop on *Formal and Cognitive Reasoning* took place in Dresden (2015), Bremen (2016), Dortmund (2017), Berlin (2018), Kassel (2019), and Bamberg/online (2020).

## Organization of the Workshop

As in the past, the workshop *Formal and Cognitive Reasoning* (FCR-2021) at KI-2021, the 44th German Conference on Artificial Intelligence, was organized jointly by the GI special interest groups *Wissensrepräsentation und Schließen* and *Kognition*. The FCR workshop series emerged from two separate workshop series, namely *Dynamics of Knowledge and Belief* (DKB) and *KI & Kognition* (KIK).

This volume contains the papers presented at the FCR-2021 workshop held on 28-Sep-2021. The KI-2021 conference and all its workshops were expected to take place in Berlin, Germany. However, because of the corona pandemic all were turned into fully virtual events.

Each FCR submission was reviewed by two program committee members. The committee decided to accept seven papers for presentation. In consequence, the workshop hosted contributions with diverse topics such as artificial mental states, consciousness, cognitive models, conditionals, description logics, belief revision, and defeasibility. We are grateful to Abhaya Nayak for enriching the program by a very inspiring keynote talk.

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### **Acknowledgments**

The organizers of this workshop would like to thank the organizers of the KI-2021 conference for their support. We also would like to thank the members of the program committee and the additional reviewers for their help in carefully reviewing and selecting the submitted papers, and finally all participants of the workshop for their contributions. Our wish is that new inspirations and collaborations between the contributing disciplines will emerge from this workshop.

Christoph Beierle, Marco Ragni, Frieder Stolzenburg, Matthias Thimm

### **Workshop Organizers and Co-Chairs**

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