SOQE 2021

The Second Workshop on Second-Order Quantifier Elimination and Related Topics

Online Event, November 4, 2021

Associated with KR 2021, the 18th International Conference on Principles of Knowledge Representation and Reasoning, November 3–12, 2021

Proceedings

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Preface

This volume contains the papers presented at the Second Workshop on Second-order Quantifier Elimination and Related Topics (SOQE 2021) held on November 4, 2021, due to the pandemic situation as an online event, associated with the 18th International Conference on Principles of Knowledge Representation and Reasoning (KR 2021). It continues the SOQE Workshop Series, which was initiated with SOQE 2017 in Dresden.

Second-order quantifier elimination (SOQE) is the problem of equivalently reducing a formula with quantifiers upon second-order objects such as predicates to a formula in which these quantified second-order objects no longer occur. In slight variations, SOQE is known as forgetting, projection, predicate elimination, and uniform interpolation. It can be combined with various underlying logics, including propositional, modal, description and first-order logics. SOQE and its variations bear strong relationships to Craig interpolation, definability and computation of definientia, the notion of conservative theory extension, abduction, notions of weakest sufficient and strongest necessary condition, and generalizations of Boolean unification to predicate logic. It is attractive as a logic-based approach to various computational tasks, for example, the computation of circumscription, the computation of modal correspondence properties, forgetting in knowledge bases, knowledge-base modularization, abductive reasoning and generating explanations, the specification of non-monotonic logic programming semantics, view-based query processing, and the characterization of formula simplifications in reasoner preprocessing.

Given the relevance of SOQE and related topics for various particular fields, our call for papers asked not just for novel contributions, but also for abstracts of pre-published work that so far was presented only in other contexts. We received 14 papers out which 12 were accepted for this volume, 5 as regular papers, 3 as short papers and 4 as abstracts of pre-published work. In addition to the contributed papers, the program included two invited talks by leading experts:

- Frank Wolter on *Living Without Beth and Craig: Explicit Definitions and Interpolants without Beth Definability and Craig Interpolation*
- David Toman on *Projective Beth Definability and Craig Interpolation for Relational Query Optimization*

We would like to thank all those involved for their enthusiasm and high-quality contributions, in particular, the invited speakers, the authors of research papers, the members of the Program Committee, and the KR 2021 Workshop Chairs Markus Krötzsch and Yongmei Liu who provided excellent support.

November 2021

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