Hybrid Answer Set Programming: Opportunities and Challenges

Joint DL+NMR Invited Talk Abstract

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Keywords
Hybrid AI, neuro-symbolic integration, neural networks, answer set programming, ontologies

In the recent years, the interest in combining symbolic and sub-symbolic AI approaches has been rapidly increasing. In particular neuro-symbolic AI, in which the two approaches have been combined in a number of different ways, is in the center of attention. A natural question in this context is how answer set programs, one of the main non-monotonic rule-based formalisms in use today, may fit into this endeavor. Several authors have considered how to combine answer set programs with subsymbolic AI, specifically with (deep) neural networks, at varying levels of integration in order to facilitate semantics-enhanced applications of AI that build on subsymbolic AI such as scene classification, object tracking, or visual question answering. In this talk, we shall consider hybrid answer set programming approaches and explore opportunities and challenges for them. Notably, combining answer set programs with alternative inference approaches is not novel and has been extensively studied e.g. for logic-based ontologies. We shall also revisit lessons learnt from such work for the ongoing work on hybrid answer set programming.