

Cross-Translating Answer Set Programs^{*}

(Invited Talk)

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Abstract. Answer set programming (ASP) [2] is a declarative programming paradigm where computation takes place in two phases. The rules of a logic program are first instantiated after which the answer sets of the resulting ground program are computed. There are two mainstream approaches to the search for answer sets: either by using native answer set solvers or by translating ground rules into other kinds of constraints and using other off-the-shelf solver technology to perform the search. Over the years, we have developed a number of translations from ASP to Boolean satisfiability (SAT) [4], difference logic [5], bit-vector logic [7], and mixed integer programming [6]. If a target formalism does not support extended rule types [8], they have to be normalized [1, 4] before translation. Our latest translation of ASP into SAT modulo acyclicity [3] enables a cross-compilation architecture where the back-end formalism is determined by the last translation step generating Clark’s completion extended by acyclicity constraints. In this invited talk, I describe the resulting cross-translation framework¹ for ASP and discuss lessons learned from the ten-year development of the framework.

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¹ <http://research.ics.aalto.fi/software/asp/lp2acyc/>