Integrating Grounding in the Search Process for Answer Set Computing

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Résumé en anglais	Answer Set Programming (ASP) is a very convenient paradigmto represent knowledge in Artificial Intelligence and to encode Constraint Satisfaction Problems. For that, the natural way to use ASP is to elaborate a first order logic program with default negation encoding the problem to solve. In a preliminary step this program is translated in an equivalent propositional one by a first tool: the grounder. Then, the propositional program is given to a second tool: the solver. This last one computes (if they exist) one or many answer sets (models) of the program, each answer set encoding one solution of the initial problem. Today, we can say that almost all ASP solvers follow this approach of two steps computation. In this work, we begin by putting in evidence that sometimes the preliminary grounding phase is the only bottleneck for the answer set computation. We show that a lot of useless and counterintuitive work is done in some situations. But, our major contribution is to introduce a new approach of answer set computing that escapes the preliminary phase of rule instantiation by integrating it in the search process. Furthermore, we describe the main lines of the first implementation of our new ASP solver ASPeRiX developed following the introduced methodology.
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