

# Answer Set Programming, the Solving Paradigm of Knowledge Representation and Reasoning: Overview and recent developments

Torsten Schaub\*

University of Potsdam, Germany  
torsten@cs.uni-potsdam.de

**Abstract.** Answer Set Programming (ASP; [1,2,3,4]) is a declarative problem solving approach, combining a rich yet simple modeling language with high-performance solving capacities. ASP is particularly suited for modeling problems in the area of Knowledge Representation and Reasoning involving incomplete, inconsistent, and changing information. From a formal perspective, ASP allows for solving all search problems in  $NP$  (and  $NP^{NP}$ ) in a uniform way (being more compact than SAT). Applications of ASP include automatic synthesis of multiprocessor systems, decision support systems for NASA shuttle controllers, reasoning tools in systems biology, and many more. The versatility of ASP is also reflected by the ASP solver `clasp` [5,6,7], developed at the University of Potsdam, and winning first places at ASP'09, PB'09, and SAT'09.

The first part of the talk will give an overview about ASP, its modeling language, solving methodology, and portray some of its applications. The second part will describe a general approach to complex preference handling, enabled by recent advances in grounding technology. To be more precise, this part introduces a general implementation technique taking advantage of meta-programming, thus reusing existing ASP systems to capture various forms of qualitative preferences among answer sets.

## References

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\* Affiliated with Simon Fraser University, Canada, and Griffith University, Australia.

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