Informatik-Oberseminar

Fachgruppe Informatik

Lehr- und Forschungsgebiet Informatik 2

RHEINISCH-WESTFÄLISCHE TECHNISCHE HOCHSCHULE AACHEN

EINLADUNG

Zeit: Montag 08. Dez. 2008, 08.15 Uhr

Ort: AH 1, Ahornstr. 55

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Titel: Static Termination Analysis for Prolog using Term Rewriting and SAT Solving

Abstract:

The most fundamental decision problem in computer science is the halting problem, i.e., given a description of a program and an input, decide whether the program terminates after finitely many steps or runs forever on that input. While Turing showed this problem to be undecidable in general, developing static analysis techniques that can automatically prove termination for many pairs of programs and inputs is of great practical interest.
This is true in particular for logic programming, as the inherent lack of direction in the computation virtually guarantees that any non-trivial program terminates only for certain classes of inputs.
In this talk, we show that techniques developed for proving termination of term rewriting can successfully be applied to analyze logic programs. The new techniques developed significantly extend the applicability and the power of automated termination analysis for logic programs.
In particular, we present a new pre-processing approach to transform logic programs with cuts into cut-free logic programs. Then, a new transformations from logic programs to a specialized version of term rewriting makes it possible to reuse techniques developed for termination analysis of term rewriting. We also show how to search for certain popular classes of well-founded orders on terms more efficiently by encoding the search into satisfiability problems of propositional logic.
The contributions presented in this talk are implemented in our fully automated termination prover AProVE. The significance of our results is demonstrated by the fact that AProve has reached the highest score both for term rewriting and logic programming at the annual international Termination Competitions in 2004, 2005, 2006, 2007, and 2008. In this competition, the leading automated tools try to analyze termination of programs from different areas of computer science.

Es laden ein: Die Dozenten der Informatik