Invited Talk

Disequalities in Horn Clause Representations of Finite Tree Automata

Andreas Reuß
Technical University Munich
reuss@model.in.tum.de

Abstract

Analyses of term-manipulating programs can nicely be specified by means of Horn clauses. In general, though, Horn clauses are undecidable. The class H1 is a very convenient subclass of general Horn clauses since it allows arbitrary preconditions and therefore can approximate arbitrary Horn clauses in a natural way. Still H1 can be normalized into a form which may be seen as a representation of a finite (bottom-up) tree automaton. Thus, finite sets of H1-clauses are equally expressive as FTA. We study extensions of Horn clauses with disequality constraints and show that H1-clauses with such disequality constraints can still be normalized to automaton form. Since emptiness is decidable for tree automata with such constraints (in particular, for path disequalities (Comon-Lundh and Jacquemard, 1994) and hom-path disequalities (Godoy et al. 2010)), it follows that satisfiability is decidable for finite sets of H1-clauses with constraints. The presented work is joint work with Helmut Seidl.