Informatik-Kolloquium

Fachgruppe Informatik

Lehr- und Forschungsgebiet Informatik 2

RHEINISCH-WESTFÄLISCHE TECHNISCHE HOCHSCHULE AACHEN

EINLADUNG

Zeit: Montag, 08.12.2008, 14.30 Uhr

Ort: Raum 6019, Ahornstr. 55

Referent: Prof. Dr. Michael Codish
Ben-Gurion University, Beer-Sheva/Israel

Titel: Proving Termination with Size Change Graphs: Theory, Practice & (Boolean) Satisfaction

Abstract:

Size change graphs provide an abstract mathematical representation which describes how the size of "the data" changes in the transitions made by a given program. Size change graphs provide also a basis to reason about the termination of the programs they describe.

I will present two techniques to prove termination based on size change graphs: the more standard "global approach" and the more interesting "local approach". I will show the correctness result for the local approach which applies Ramsey's Theorem. I will also show a completeness result which states that for a given set of size change graphs, if there exists any proof of termination then there exists one of a very simple form. Here hides one main advantage of the local approach: Size change termination is decidable and easy to automate.

Deeper hiding is also the main pitfall: proofs of termination in the local approach may introduce an exponential number of graphs which must be considered. To counter this problem I will come back to the global approach and illustrate a new approach to proving termination with size change graphs. This is the first decision procedure for size change termination (SCT) which makes direct use of global ranking functions. It handles a well-defined and significant subset of SCT instances, designed to be amenable to a SAT-based solution. We have implemented the approach using a state-of-the-art Boolean satisfaction solver. Experimentation indicates that the approach is a viable alternative to the complete SCT decision procedure based on local ranking functions.

Es laden ein: Die Dozenten der Informatik