

# EINLADUNG

Zeit: Freitag, 11. Dezember 2009, 09:00 Uhr

Ort: AH II, Ahornstr. 55

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Titel: Reachability over Word Rewriting Systems

## Abstract:

A successful approach to the verification of infinite-state systems is to represent system states by words and transitions by rewriting rules. The fundamental problem of verification is the reachability test: Given two words (states)  $u$  and  $v$ , can  $u$  be transformed into  $v$  by finitely many rewriting steps?

We start by recalling some basic results about the decidability of this problem, in particular for the cases that the rewriting of words takes place at infixes or prefixes; in the first case we obtain the power of Turing machines, in the second that of pushdown machines.

Our new results are concerned with two extensions: First we obtain refined information (e.g., regarding efficiency) in the case that the reachability relation is decidable, by distinguishing several approaches to establish decidability. Secondly, we extend the classical rewriting models by allowing mixed prefix and suffix rewriting, as well as other types of rules that correspond to splitting and merging processes defined by word rewriting. Here the borderline between decidability and undecidability of the respective reachability problems is determined. We also present results concerning the classes of graphs that can be represented by these types of rewriting systems and the trace languages of such graphs.

Es laden ein: Die Dozenten der Informatik