

## **EINLADUNG**

Zeit: 24. Okt. 2007, 15.00 Uhr

Ort: AH III, Ahornstr. 55

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Titel: The DP Framework for Proving Termination of  
Term Rewriting

### **Abstract:**

Termination is the fundamental property of a program that for each input, the evaluation will eventually stop and return some output. Although the question whether a given program terminates is undecidable, many techniques have been developed which can be used to answer the question of termination for many programs automatically. Especially, termination of term rewriting is an interesting and widely studied area: Since the basic evaluation mechanism of many programming languages is term rewriting, one can successfully apply the termination techniques for term rewriting to analyze termination of programs automatically. Nevertheless, there still remain many programs that cannot be handled by any current technique that is amenable to automation.

Currently, one of the most powerful techniques for mechanized termination analysis of term rewrite systems is the dependency pair approach. We extend this approach to a DP framework which increases the modularity of a termination proof significantly. Moreover, this framework facilitates the development of new methods for termination analysis. To demonstrate this, we improve existing and design several novel techniques within the dependency pair framework. They can successfully be applied to prove termination of previously challenging programs.

All presented techniques are implemented in our fully automated termination prover AProVE. The significance of our results is demonstrated at the annual international Termination Competition, where the leading automated tools try to analyze termination of programs from different areas of computer science: Without our contributions, AProVE would not have been the winner in the years 2004 - 2007.

**Es laden ein: Die Dozenten der Informatik**