Informatik-Kolloquium
Fachgruppe Informatik
Lehrstuhl Informatik 2

RWTH
RHEINISCH-WESTFÄLISCHE TECHNISCHE HOCHSCHULE AACHEN

EINLADUNG

Zeit: Dienstag, 26. Jan. 2010, 10:00 Uhr

Ort: Raum 5056, Ahornstr. 55

Referent: Prof. Dr. Franck van Breugel,
               York University, Toronto

Titel: Behavioural Pseudometrics

Abstract:

Concurrent systems are often modelled by means of labelled transition systems. A labelled transition system is similar to a nondeterministic finite automaton. In contrast to a finite automaton, the set of states and the set of actions of a labelled transitions may be infinite. Furthermore, a labelled transition system does usually not have an initial state or final states.

A behavioural equivalence is an equivalence relation on the states of a labelled transition system. Such a relation captures which states behave the same. Many different behavioural equivalences have been proposed. Bisimilarity is considered to be one of the key behavioural equivalences for labelled transition systems.

To model concurrent systems in which quantitative data, such as probabilities and time, play a crucial role, several variations on labelled transition systems have been put forward. Notions of behavioural equivalence like bisimilarity have been adapted to these systems. However, such discrete Boolean-valued notions (states are either behaviourally equivalent or they are not) sit uneasily with systems featuring quantitative data. If some of this data change a little bit --the data are often obtained experimentally and, hence, are usually approximations-- states that used to be behaviourally equivalent may not be anymore or vice versa. In conclusion, behavioural equivalences are not robust.

To address this problem, pseudometrics that assign a distance, a real number between 0 and 1, to each pair of states have been proposed. Such a pseudometric yields a smooth and quantitative notion of behavioural equivalence. The distance between states is used to express the similarity of their behaviour. The smaller the distance, the more alike the states behave. In particular, the distance between states is zero if they are behaviourally indistinguishable.

In my talk, I will discuss behavioural pseudometrics and present algorithms to approximate them.

This talk is based on joint work with Claudio Hermida, Michael Makkai, Mike Mislove, Joel Ouaknine, Steven Shalit, Babita Sharma, James Worrell and Hongming Wu.

Es laden ein: Die Dozenten der Informatik