CARL VON OSSIETZKY universität OLDENBURG

Fakultät II *Informatik, Wirtschafts- und Rechtswissenschaften*
Department für Informatik

Internes Kolloquium

Am **Montag,** den **31. Oktober 2016,** um **16:00 Uhr** hält

Evgeny Erofeev
Universität Oldenburg

im Rahmen seiner beabsichtigten Dissertation einen Vortrag mit dem Titel

Characterisation of sequences synthesisable with Petri nets

Der Vortrag findet im OFFIS, Escherweg 2, Raum F02 statt.

Abstract:

Petri net synthesis, a branch of distributed system synthesis, employs the theory of regions in order to characterise the class of synthesisable labelled transition systems. This theory is based on solving systems of linear inequalities. A polynomial time algorithm results from it; but there are two disadvantages. Firstly, very many such inequalities with lots of variables may need to be solved, in practice leading to a slow algorithm. Secondly, not much useful information can be obtained, because the inequalities characterise the class of synthesisable transition systems in a very indirect way. It is therefore desirable to investigate structural conditions for Petri net synthesis to succeed or to fail, that is, to detect direct, i.e. graph-theoretical, properties of a transition system which cause its synthesisability or non-synthesisability.

Starting with the case of a linearly ordered finite transition system (a sequence) and two labels (i.e., Petri net transitions), we study necessary and sufficient conditions for (non-)synthesisability of this transition system by a Petri net. As a result, we propose two characterisations for (non-)synthesisability of finite sequences: one is based on the counting of ratios between labels, and the other one is based on general patterns characterising non-synthesisability of a binary sequence. Based on these two characterisations, algorithms for checking (non-)synthesisability of a given sequential labelled transition system have been obtained. These algorithms are faster than the known general Petri net synthesis algorithms. First of the proposed algorithms, the letter-counting algorithm, characterises synthesisability of the given labelled transition system. In case of a positive answer, this algorithm also produces a Petri net implementation. The second algorithm suggests a criterion for non-synthesisability based on the pattern-matching. It can also serve as part of a quick-fail algorithm in a larger synthesis context.

Betreuer: Prof. Dr. Eike Best

Weitere Kolloquiumstermine sind im WWW abrufbar.