Informatik-Kolloquium

Rheinisch-Westfälische Technische Hochschule Aachen
Lehrstuhl für Informatik I

EINLADUNG

Zeit: Freitag, 06. September 2002, 11.00 Uhr

Ort: Raum 4013, Ahornstr.55
(Seminarraum Informatik I)

Referent: Dr. Ralf Klasing
Kings College London/England

Thema: Hardness results and approximation algorithms of k-tuple domination in graphs

Abstract:
In this talk, we study hardness results and approximation algorithms of *k*-tuple domination in graphs. The *k*-tuple domination problem is a generalization of the dominating set problem in graphs in which each vertex of the graph has to be dominated at least *k* times (instead of just once).

We describe an $(\ln |V| + 1)$-approximation algorithm for the *k*-tuple domination problem in general graphs, and show that *k*-tuple domination cannot be approximated within a ratio of $(1-\varepsilon) \ln |V|$ for any $\varepsilon > 0$ unless NP $\subseteq$ DTIME($|V|^{\log\log|V|}$).

We also prove that the *k*-tuple domination problem is approximable within a constant ratio if the degree of the graph is bounded by a constant, but that it is APX-hard to approximate for graphs of maximum degree *k*+2. Note that a graph *G* possesses a *k*-tuple dominating set if and only if the degree of each vertex in *G* is at least *k*-1.

Furthermore, we study the *k*-tuple domination problem in *p*-claw free graphs. These are graphs which do not have $K_{1,p}$ as an induced subgraph. We show that the *k*-tuple domination problem is approximable within a constant ratio in *p*-claw free graphs, but that it is APX-hard to approximate for 5-claw free graphs.

(joint work with Christian Laforest, Université d'Evry)

Es laden ein: Die Dozenten der Informatik