

EINLADUNG

Zeit: Dienstag, 30. April 2013, 16.00 Uhr

Ort: Raum 4017, Ahornstr. 55, E1

Referent: Dipl.-Inform. Marcel Ochel

Thema: Approximation and Online Algorithms for
Selected Network Optimization Problems

Optimizing energy efficiency is a fundamentally important issue in modern communication networks. In this talk, the objective of optimal energy usage will be studied on two fundamental classes of wireless network optimization problems, namely *network lifetime maximization* and *OFDMA scheduling*.

Motivated by the behavior of battery depletion in wireless sensor networks we introduce and analyze a novel online model for general linear packing problems, applicable to a broad class of network lifetime maximization problems.

We propose online algorithms with the advantageous property that they do not require any explicit linear programming formulation; hence, they are also suited when algorithmic efficiency is an issue. The presented online algorithms outperform naive strategies by at least a logarithmic factor with respect to the given degree of uncertainty. Complementarily we bound the competitiveness of arbitrary deterministic or randomized online algorithms in this model.

In the second part of the talk, we study energy minimization and data rate maximization in the context of orthogonal frequency division multiplexing (OFDM) whose related scheduling problems have been intensively studied by the engineering sciences; however, we are the first to conduct a theoretical worst-case analysis of this practically relevant class of network optimization problems for which no lower and no upper bounds on the approximability were known before.

While we will show that—already on a very restricted subclass—the problem of minimizing the required transmission power for given data rate demands can not be approximated by any (polynomial time computable) factor, we will also see that the dual objective of proportionally maximizing the data rates for a given total transmission power is approximable arbitrarily close to the optimum on this subclass.

Es laden ein: Die Dozenten der Informatik