DOCTORAL PROGRAM
DISCRETE MATHEMATICS
TU & KFU GRAZ · MU LEOBEN
AUSTRIA

Graz University of Technology

Institut für Diskrete Mathematik

Seminar für Kombinatorik und Optimierung

2.7.2020, 16:15 (talk), 15:50-16:15 informal chat

online meeting (Webex)

Keeping a graph connected via nonpreemptive edge scheduling (Maximizing the minimum load time in a graphic matroid)

Lasse Wulf

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Consider the following process over time: Given a graph $G = (V, E)$ with positive integral edge weights $w(e)$, we choose for each edge e exactly one time point $t(e) \in [0, \infty)$. This causes e to be active during the interval $[t(e), t(e) + w(e)]$. We now ask how we can choose the times $t(e)$ such that the subgraph of active edges is spanning for a maximal amount of time. The problem is related to the classical problems of spanning tree packing and Menger's problem. It can also be seen as a generalization of maximizing the minimum load time in nonpreemptive scheduling. In this talk, we show that the problem is NP-complete, even if $G = K_{2,n}$ or if $w(e) \in \{1, ..., 6\}$. Furthermore, if P $\neq$ NP, the problem can not be approximated in polynomial time by a factor better than 7/6. On the other hand, if both the treewidth of the input graph and the edge weights are bounded by a constant, we give a linear time algorithm.

Webex meeting info

Meeting number (access code): 137 382 3722

Meeting password: 8diN3Pd9q34

`https://tugraz.webex.com/tugraz/j.php?MTID=m01485e57708c11c02cfe8673af6dcd11`

Eranda Dragoti-Çela and Bettina Klinz