

Oberseminar Theoretische Informatik
Sommersemester 2009

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**A Complexity Dichotomy for Finding Disjoint
Solutions of Vertex Deletion Problems**

Montag, 06.07.2009 14:00 (c.t.) Seminarraum 3319 (Ernst-Abbe-Platz 2, 3.
Stock).

We investigate the computational complexity of a general “compression task” centrally occurring in the recently developed technique of iterative compression for exactly solving NP-hard minimization problems. The core issue (particularly but not only motivated by iterative compression) is to determine the computational complexity of, given an already inclusion-minimal solution for an underlying (typically NP-hard) vertex deletion problem in graphs, to find a better *disjoint* solution. The complexity of this task is so far lacking a systematic study. We consider a large class of vertex deletion problems on undirected graphs and show that, except for few cases which are polynomial-time solvable, the others are NP-complete. This class includes problems such as VERTEX COVER (here the corresponding compression task is decidable in polynomial time) or UNDIRECTED FEEDBACK VERTEX SET (here the corresponding compression task is NP-complete).

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