

Oberseminar Theoretische Informatik

Wintersemester 2008/2009

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A Cubic-Vertex Kernel for Flip Consensus Tree

Monday, November 17 at 2pm (c.t.)
in room 3319 (Ernst-Abbe-Platz 2, floor 3).

Given a bipartite graph $G = (V_c, V_t, E)$ and a non-negative integer k , the NP-complete MINIMUM-FLIP CONSENSUS TREE problem asks whether G can be transformed, using up to k edge insertions and deletions, into a graph that does not contain an induced P_5 with its first vertex in V_t (a so-called M -graph or Σ -graph). This problem plays an important role in computational phylogenetics, V_c standing for the characters and V_t standing for taxa. Chen et al. [IEEE/ACM TCBB 2006] showed that MINIMUM-FLIP CONSENSUS TREE is NP-complete and presented a parameterized algorithm with running time $O(6^k \cdot |V_t| \cdot |V_c|)$. Recently, Böcker et al. [IWPEC '08] presented a refined search tree algorithm with running time $O(4.83^k(|V_t| + |V_c|) + |V_t| \cdot |V_c|)$. We complement these results by polynomial-time executable data reduction rules yielding a problem kernel with $O(k^3)$ vertices.

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