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Discrete Mathematics Seminars

Bipartite Graphs, Combinatorial Problems, and An Application to Bioinformatics

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Abstract

Given a bipartite graph on two layers where vertex ordering on one layer is fixed, the problem of finding an ordering of the other layer such that the number of straight-line edge-crossings is minimum has received much attention in literature. The problem is NP-complete and several practically efficient heuristics and polynomial-time algorithms with a constant approximation ratio have been suggested. We generalize the problem and consider the version where the edges have nonnegative weights. We provide a polynomial-time 3-approximation algorithm. We discuss its application to a bioinformatics problem, biclustering gene expression data, where an expression matrix is reorganized to enable the extraction of highly correlated submatrices.

Date: Friday, March 27, 2009
Time: 11:00
Place: IMBM Seminar Room, Boğaziçi University