Optimization via Branch Decomposition

William J. Cook

Princeton University, Princeton, USA

ABSTRACT

Robertson and Seymour introduced branch-width as a new connectivity invariant of graphs in their proof of the Wagner conjecture. Decompositions based on this invariant provide a natural framework for implementing dynamic programming algorithms to solve graph optimization problems. In earlier work on the traveling salesman problem we used this framework in a heuristic algorithm to obtain near-optimal solutions to large-scale instances. In this talk we will discuss the computational issues involved in using branch-width as as a general tool in discrete optimization. We will present applications to Euclidean Steiner tree problems, graph bipartition, maximum cut problems, and maximum stable set problems.

References

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