

به نام آن که جان را فکرت آموخت



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Classical Network design problems with extra constraints

Abstract

In this talk we consider some classical network design problems with degree or order constraints. The first problem we consider is the Survivable Network Design problem with degree constraints on vertices. The objective is to find a minimum cost subgraph which satisfies connectivity requirements between vertices and also degree upper bounds B_v on the vertices. We present a $(2, 2B_v + 3)$ -approximation algorithm for the edge-connectivity Survivable Network Design problem with degree constraints, where the cost of the returned solution is at most twice the optimum solution (satisfying the degree bounds) and the degree of each vertex v is at most $2B_v + 3$. We also study the problem of finding a minimum cost l -edge-connected subgraph with at least k vertices. This generalizes some well-studied classical problems such as the k -minimum-spanning tree and the minimum cost l -edge-connected subgraph problems. We give a poly-logarithmic approximation for the case of $l=2$ and give evidences that the problem might be hard to approximate for arbitrary large l .

Biography

Mohammad Reza Salavatipour is an assistant professor of Computer Science at University of Alberta. He received a BS degree in Computer Engineering from Sharif University of Technology, and an MS in Computer Science from University of Toronto. He has a PhD in Computer Science from Toronto University. His PhD dissertation focuses on graph colouring via the discharging method. He received a Postdoctoral fellow from University of Waterloo in 2003. In 2007 he received Alberta Ingenuity New Faculty Award for three years. His other research interests include approximation algorithms, probabilistic and randomized algorithms, hardness of approximation, combinatorics and algorithmic graph theory, the probabilistic method, the discharging method.