APPLIED MATHEMATICS COLLOQUIUM

QUICKLY COMPUTING APPROXIMATE SOLUTIONS TO NP-HARD OPTIMIZATION PROBLEMS IN PLANAR GRAPHS

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ABSTRACT:

In addressing an NP-hard problem in combinatorial optimization, one way to cope is to use an *approximation scheme*, an algorithm that, for any given ε 0, produces a solution whose value is within a ε factor of optimal. For many problems on graphs, obtaining such accurate approximations is NP-hard if the input is allowed to be any graph but is tractable if the input graph is required to be planar.

Research on polynomial-time approximation schemes for optimization problems in planar graphs goes back to the pioneering work of Lipton and Tarjan (1977) and Baker (1983). Beginning in 2005, however, a flurry of results were obtained, greatly broadening the range of problems for which fast approximation schemes for planar graphs are known. In this talk, we describe one approach to obtaining such approximation schemes for problems such as Traveling Salesman, Steiner Tree, and, most recently, Multiterminal Cut.

The talk will touch on joint work with Mohammad Hossein Bateni, Glencora Borradaile, MohammadTaghi Hajiaghayi, and Claire Mathieu.

MONDAY, MAY 2, 2011
4:30 PM
Building 2, Room 105

Refreshments are available in Building 2, Room 290
(Math Common Room) between 3:30 and 4:30 PM

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