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İSTANBUL DISCRETE MATHEMATICS MEETINGS

Topics in Randomized Algorithms

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Abstract

This talk is a general overview of the use of randomization to various types of algorithmic problems, particularly of a graph theoretic nature. We introduce with some examples on MinCut and MST, illustrating the benefit of simplicity. We continue with random walk based methods both to illustrate complexity bounds for the randomized logspace class, and to give intuition for randomized approximation schemes for hard counting problems. This brings us to a major open question on whether or not there is a gap between randomized logspace and deterministic logspace: Namely, to what extent may we derandomize?

Graph theoretic techniques based on expanders are useful throughout these questions. Finally, we also mention some problems in the distributed algorithmic setting where, in one case, a provably exponential gap in time complexity exists between randomized and deterministic versions, and in another case, literally the deterministic version is impossible to solve in general whereas a randomized approach is both possible and uncomplicated

Date: Friday, April 15, 2011
Time: 11:00
Place: IMBM Seminar Room, Boğaziçi University