APPLIED MATHEMATICS COLLOQUIUM

A PRIMAL DUAL APPROACH TO ONLINE OPTIMIZATION PROBLEMS

SEFFI NAOR
Computer Science Department
Technion, Israel

ABSTRACT:

A unified approach, based on the primal-dual method, is discussed for a wide range of online covering and packing problems, having various objective functions. This approach has lead to a simple alternative view and analysis of many previously suggested algorithms, as well as new results. In particular, a randomized $O(\log k)$-competitive online algorithm for the weighted paging problem, where there is a (page dependent) weight for fetching each page into the cache, and k is the cache size.

This is the first randomized $o(k)$-competitive algorithm for the problem and its competitiveness matches the known lower bound on the problem. Weighted paging is a special case (weighted star metric) of the well known k-server problem for which it is a major open question whether randomization can be useful in obtaining sublinear competitive bounds. The focus of the talk will be on developing the general methodology.

Based on papers with Nikhil Bansal, Niv Buchbinder and Kamal Jain.

MONDAY, SEPTEMBER 8, 2008
4:30 PM
Building 4, Room 231

Reception at 4:00 PM in Building 2, Room 349
(Applied Math Common Room))

Applied Math Colloquium: http://www-math.mit.edu/amc/fall08
Math Department: http://www-math.mit.edu