UNIVERSITY AT BUFFALO
STATE UNIVERSITY OF NEW YORK

DEPARTMENT OF COMPUTER SCIENCE

Presents

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Optimal Information Gathering on the Internet with Time and Cost Constraints

The World Wide Web provides access to vast amounts of information, but with increasing frequency content providers are charging for the information and services they supply. Thus the consumer must weigh the benefit of asking for information against the cost (both in terms of money and time) of acquiring it. We study information gathering strategies that maximize the expected value to the consumer. In our model there is a single information request, which has a known *benefit* to the consumer. To satisfy the request, *queries* can be sent simultaneously or in sequence to any one of a finite set of independent *information sources*. For each source we know the monetary cost of making the query, the amount of time it will take, and the probability that the source will be able to provide the requested information. A *policy* specifies which sources to contact at which times, and the *expected value* of the policy can be defined as some function of the likelihood that the policy will yield an answer and the expected monetary cost and time delay associated with executing the policy. The problem is to find an expected-value-maximizing policy.

In this lecture, we explore several variants of the objective value function. The problem of devising an optimal policy is shown to be NP-hard for all the variants, and some efficient approximation algorithms and schemes with guaranteed error bounds are presented. A fundamental difference between our problem and the traditional scheduling problems is that, while a traditional schedule has to execute *all* its jobs, a querying policy terminates whenever one successful answer is returned.

This is a joint work with Oren Eztioni, Steve Hanks and Omid Madani.

Place: 110 Knox, Amherst Campus
Date: Friday, Sept. 13, 1996
Time: 3:00 – 4:15 p.m.

A reception follows the talk in 224 Bell Hall.

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