



## UMass Lowell Computer Science Colloquium Announcement

**Speaker:** Donghui Zhang, Northeastern University  
**Date & Time:** Wednesday, Dec. 6, 2006, 3:00pm--4:00pm  
**Place:** Olsen 311, Refreshments are served at 2:30pm

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### The Min-Dist Optimal-Location Query

Consider two location data sets: a set of sites e.g. McDonald's, and a set of customers. Given a spatial region  $Q$ , the min-dist optimal-location query returns a location in  $Q$  which, if a new site is built there, minimizes the average distance from each customer to its closest site. This query can help a franchise decide where to put a new store in order to maximize the benefit to its customers. To solve this problem is challenging, for there are theoretically infinite number of locations in  $Q$ , all of which could be candidates. We first provide a theorem that limits the number of candidate locations without losing the power to find exact answers. Then we present a progressive algorithm that quickly suggests a location, tells the maximum error it may have, and keeps refining the result. When the algorithm finishes, the exact answer can be found. The intermediate result of early runs can be used to prune the search space for later runs. Crucial to the pruning technique are novel lower-bound estimators. The proposed algorithm, the effect of several optimizations, and the progressiveness are experimentally evaluated.

#### *Bio:*

Professor Donghui Zhang received his Ph.D. in 2002 from the University of California -- Riverside. Since then, he has been working as an Assistant Professor in the College of Computer & Information Science, Northeastern University. Professor Zhang's primary research area is databases. In particular, query optimization in spatio-temporal database systems. Many real application data have spatial and/or temporal dimensions. For instance, the locations of apartment buildings, cars, mobile-phone users which may or may not change over time. The concern is how to index such objects and how to efficiently compute the result of interesting queries. Professor Zhang received the NSF CAREER Award: Fast Query Support for Emerging Spatial Database Applications. He has written two book chapters and published over twenty peer-refereed research papers. He has served on the panels of two NSF programs, on the Program Committees of various international conferences including ICDE'07, SSTD'07, VLDB'05, ICDE'04 and EDBT'04, and as referee for over 10 journals such as TODS and VLDBJ.