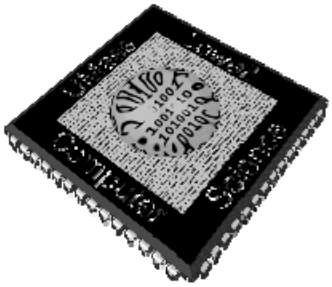

UMass Lowell
Computer Science Colloquium
Announcement

Speaker: Dina Goldin, Brown University
Date & Time: Wednesday, Oct. 25, 2006, 3:00pm--4:00pm
Place: Olsen 311, Refreshments are served at 2:30pm

In Search of Meaning for Time Series Subsequence Clustering

Recent papers have claimed that the result of K-means clustering for time series subsequences (STS clustering) is "meaningless", because it is independent of the time series that created it. We revisit this claim; in particular, we consider the following question:

> Given several time series sequences and a set of STS cluster centroids from one of them (generated by the K-means algorithm), is it possible to reliably determine which of the sequences produced these cluster centroids?

We answer this question in the affirmative, thereby establishing a strong relation between the result of K-means STS clustering and the time series sequence that created it, despite earlier predictions that this is not possible.

We start by presenting "cluster shape distance", a new distance measure for time series subsequence clusters, based on cluster shapes. We then present an algorithm based on this distance measure, which matches a set of STS cluster centroids with the time series that produced it. In our experiments with a dataset of 10 sequences, it produced a correct match 100% of the time.

We conclude by analyzing why cluster shape distance allows us to match STS clusters to the original sequences, whereas previous efforts have failed to do so.

Bio:

Dina Goldin is currently a researcher at Brown University, having taught at UMass/Boston and at the University of Connecticut. She has an M.S. and Ph.D. in computer science from Brown University, and a B.S. in mathematics and computer science from Yale University. Dr. Goldin is the Information Director and member of the editorial board at the ACM Computing Reviews, and a Senior Member of IEEE. She is a recipient of the NSF CAREER award, and an author of over 50 technical publications in computer science.
