UW CENTER FOR
PATTERN ANALYSIS AND MACHINE INTELLIGENCE

GRADUATE SEMINAR SERIES

Low Dimensional Localized Clustering (LDLC)

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Date: June 13, 2012

Time: 4:00 pm – 4:30 pm

Place: E5 (5128) Refreshments will be served

Abstract :

In the world of high dimensional data, it is generally conceivable to assume that the data points are on (or close to) one or more submanifolds of the space. Each of these submanifolds can be modeled by a number of linear subspaces. This is in fact the main intuition behind a majority of subspace clustering algorithms. In many cases, however, the subspaces computed by these algorithms consist of disconnected subsets of the underlying submanifolds and therefore, they do not form localized and compact clusters. To address this problem, we propose "Low Dimensional Localized Clustering (LDLC)", a new method for subspace clustering. Unlike existing methods, LDLC respects the topology of the underling submanifolds and assigns the data points to localized clusters such that the total reconstruction error is minimized. This is a valuable property in many tasks such as semi-supervised classification, image segmentation, data visualization and dimensionality reduction. We establish connections between LDLC, K-Means, and VQPCA from different perspectives, and validate our method through various experiments on synthetic and real data sets.

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