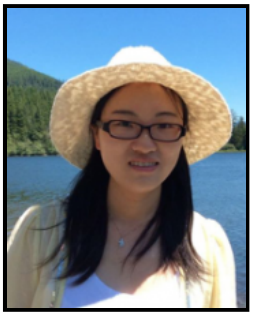

Computational Mathematics Seminar Series

Probabilistic Semi-supervised Learning via Sparse Graph Structure Learning

Li Wang, University of Texas at Arlington

Assistant Professor

Digital Media Center 1034
March 03, 2020 - 03:30 pm

Abstract:

We present a probabilistic semi-supervised learning (SSL) framework based on sparse graph structure learning. Different from existing SSL methods with either a predefined weighted graph heuristically constructed from the input data or a learned graph based on the locally linear embedding assumption, the proposed SSL model is capable of learning a sparse weighted graph from the unlabeled high-dimensional data and a small amount of labeled data, as well as dealing with the noise of the input data. Our representation of the weighted graph is indirectly derived from a unified model of density estimation and pairwise distance preservation in terms of various distance measurements, where latent embeddings are assumed to be random variables following an unknown density function to be learned and pairwise distances are then calculated as the expectations over the density for the model robustness to the data noise. Moreover, the labeled data based on the same distance representations is leveraged to guide the estimated density for better class separation and sparse graph structure learning. A simple inference approach for the embeddings of unlabeled data based on point estimation and kernel representation is presented. Extensive experiments on various data sets show the promising results in the setting of SSL compared with many existing methods, and significant improvements on small amounts of labeled data.

Speaker's Bio:

Dr. Li Wang is currently an assistant professor with Department of Mathematics and Department of Computer Science Engineering, University of Texas at Arlington, Texas, USA. She worked as a research assistant professor with Department of Mathematics, Statistics, and Computer Science at University of Illinois at Chicago, Chicago, USA from 2015 to 2017. She worked as the Postdoctoral Fellow at University of Victoria, BC, Canada in 2015 and Brown University, USA, in 2014. She received her Ph.D. degree in Department of Mathematics at University of California, San Diego, USA, in 2014. Her research interests include data science, large-scale optimization and machine learning.

This lecture has refreshments @ 03:00 pm

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