

SEMINAR NOTICE

Preston M. Green Department of Electrical and Systems Engineering

Kernel Learning of Graph-Structured Data

PhD Preliminary Research Examination

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Abstract:

Structured data modeled as graphs arise in many application domains, such as computer vision, bioinformatics, and social network mining. One interesting problem for graph-type data is quantifying their similarities based on the connectivity structure and attribute information. Graph kernels, which are positive definite functions on graphs, are powerful similarity measures, in the sense that they make various kernel-based learning algorithms, for example, clustering, classification, and regression, applicable to structured data. For instance, it is possible to classify proteins by predicting whether a given protein is an enzyme or not. In this work, we propose new graph kernels. To do this, we propose a two-step embedding framework, i.e., the Euclidean space embedding of nodes and the Hilbert space embedding of graphs. The advantages of our proposed kernels are that they can effectively exploit various node attributes while being scalable to large datasets. We conduct extensive graph classification experiments to evaluate our graph kernels. The experimental results show that our graph kernels significantly outperform existing state-of-the-art approaches in both accuracy and computational efficiency.

DATE: Friday, January 18, 2019
TIME: 3:00 p.m.
PLACE: Green Hall, Room 0120

Dissertation advisor:
Dr. Arye Nehorai

This seminar is in partial fulfillment
of the Doctor of Philosophy degree