

Date: January 22, 2010, 3 - 4pm
Location: PGH 550
Host: Rong Zheng

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Optimization in Classification

Abstract - Support Vector Machines (SVMs) are a set of learning algorithms widely used for classification and regression in data mining, machine vision, and bioinformatics. In this study, SVMs are considered within the multiple instance learning context, where data is composed of bags of instances. This setting is particularly useful when there is ambiguity in the data set (e.g., noise in clinical measurements), thus a selection process among bags of alternatives is necessary. We first extend the SVM formulation to multiple instance data and prove the problem is NP-hard. We propose an exact algorithm and present computational results on image annotation, molecular activity prediction, and breast cancer prognosis data sets. An efficient heuristic is also proposed for multiple instance classification and applied to neural data from a visuomotor categorical discrimination task to classify highly cognitive brain activities.

Bio - O. Erhun Kundakcioglu received his Ph. D. degree in Industrial and Systems Engineering at the University of Florida. His research focuses on optimization techniques for pattern recognition and machine learning. Dr. Kundakcioglu is also interested in production and inventory planning problems. He is the 2008 recipient of the Florida Chapter Scholarship given by the Healthcare Information and Management Systems Society Foundation. Dr. Kundakcioglu is an associate editor of the Journal of Global Optimization and Optimization Letters.