RUTGERS UNIVERSITY
DEPARTMENT OF STATISTICS AND BIOSTATISTICS
HILL CENTER #501, BUSCH CAMPUS, PISCATAWAY

www.stat.rutgers.edu

Seminar

Speaker: W. Art Chaovalitwongse, Professor Department of Industrial and Systems Engineering, Rutgers University

Title: Optimizing Feature Selection to Improve Pattern Recognition: From Medical Diagnosis to Information Retrieval

Date: Wednesday September 16, 2009

Time: 3:20 PM

Place: 552 Hill Center

Abstract

I will present a new optimization framework of feature selection to improve pattern recognition in large-scale data. The new framework employs the concept of inter-class and intra-class distances whereas the best feature space is selected to maximize the classification accuracy. I will discuss two real life applications of this framework: medical diagnosis and information retrieval. For medical diagnosis application, this work provides a computational tool for medical data signal processing apparatus as an advanced medical decision-support system. The goal of this research is to improve the current medical diagnosis and prognosis by assisting the physicians in recognizing (data-mining) abnormality patterns in large-scale, complex medical data. The diagnosis of epilepsy and other brain disorders will be a case point in this presentation. For information retrieval application, this work provides a computational framework for record retrieval tool. As electronic records of instances (e.g., medical records or technical defect records) accumulate, the retrieval of a record from a past instance with the same or similar circumstances has become extremely valuable. Pattern optimization for record retrieval tool is developed for the purpose of locating defect records that refer to the same defect problem. Efficiently locating a duplicate record for a current problem allows the service engineer to best assist a customer. I will present some preliminary results on real-world technical defect records from a telecommunications company.

Acknowledgements: The work is partially supported by the NSF under CAREER grant (0546574), Rutgers Computing Coordination Council (CCC), and CISCO research initiative award.