THE UNIVERSITY OF HONG KONG

Department of Mathematics

C O L L O Q U I U M

June 11, 2019 (Tuesday)
Room 210, Run Run Shaw Bldg., HKU

Dr. Yiming Ying
SUNY Albany, USA

Stochastic Optimization for AUC Maximization in Machine Learning

4:00 – 4:50pm

Stochastic optimization algorithms such as stochastic gradient descent (SGD) update the model sequentially with cheap per-iteration costs, making them amenable for streaming big data analysis. However, most of the existing studies focus on the classification accuracy which cannot be directly applied to the important problems of maximizing the Area under the ROC curve (AUC) in imbalanced classification and bipartite ranking. In this talk, I will present our recent work on developing novel SGD-type algorithms for AUC maximization. Our new algorithms can allow general loss functions and penalty terms which are achieved through the innovative interactions between machine learning and optimization. Compared with the previous literature which requires high storage and per-iteration costs, our algorithms have both space and per-iteration costs of one datum while achieving optimal convergence rates.

Dr. Jun Fan
Hong Kong Baptist University

Outlier-Robust Functional Linear Regression

4:50 – 5:40pm

Functional data analysis is concerned with inherently infinite dimensional data such as curves or images. It attracts more and more attentions due to its successful applications in many areas such as econometrics and biomedical studies. In this talk we consider outlier detection and robust prediction for functional linear regression problems within the framework of reproducing kernel Hilbert space (RKHS). We propose a double-penalized estimator for functional linear models in the presence of grossly corrupted observations. An iterative algorithm is provided for solving the corresponding optimization problem. The proposed estimator can achieve the minimax optimal rates of convergence for prediction and outlier detection simultaneously.

All are welcome