



THE HONG KONG UNIVERSITY OF SCIENCE & TECHNOLOGY

Department of Mathematics

**SEMINAR ON APPLIED MATH
AND DATA SCIENCE**

**Online robust matrix factorization for
dependent data streams**

By

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Abstract

Online Robust Matrix Factorization (ORMF) algorithms seek to learn a reduced number of latent features as well as outliers from streaming data sets. It is important to understand stability of online algorithms for dependent data streams since these are often generated by Markov chain Monte Carlo (MCMC) algorithms, but rigorous convergence analysis of most online algorithms were limited to independently obtained data samples. In this talk, we propose an algorithm for ORMF and prove its almost sure convergence to the set of critical points of the expected loss function, even when the data matrices are functions of some underlying Markov chain satisfying a mild mixing condition. We illustrate our results through dictionary learning and outlier detection problem for images and networks.

Biography: *Hanbaek Lyu is a Hedrick Assistant Professor in the Department of Math at UCLA. He earned his Ph.D. degree from the Ohio State University in 2018, under guidance of Professor David Sivakoff. His research interests lie at probability, combinatorics, complex systems, and machine learning. Recently, he is focusing the projects on online optimization algorithms and dictionary learning problems on networks.*

Date : 25 March, 2020 (Wednesday)
Time : 4:00pm – 5:00pm
Zoom Meeting : <https://hkust.zoom.com.cn/j/590198340>

All are Welcome!