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THE HONG KONG UNIVERSITY OF SCIENCE & TECHNOLOGY

Department of Mathematics

MATHEMATICS COLLOQUIUM

Some Basic Theories and Algorithms in Low-Rank Matrix Recovery

By

Prof. Song LI

School of Mathematical Sciences
Zhejiang University

Abstract

This talk will focus on some basic theories and algorithms of low-rank matrix recovery problems. Firstly, we give optimal RIP upper bound estimation and Null space equivalence characterization conditions, which involves several known conjectures. Furthermore, to study the case with robust sparse noise, we develop a unified framework of considering a non-smooth formulation with low-rank constraint for meeting the challenges of mixed noises—bounded noise and sparse noise. We show that the non-smooth formulations of the problems can be well solved by the projected sub-gradient methods at a rapid rate when initialized at any points. Finally, we discuss the stable recovery of the matrix that is simultaneously low-rank and Toeplitz, as a result, we resolves the conjecture by Chen et al.

Short Bio:
Song Li *is a Qiushi Distinguished Professor at Zhejiang University, specializing in the mathematical foundations of data science. As a pioneer in compressed sensing and low-rank matrix recovery in China, his work has been published in leading journals like ACHA, TIT, and TSP. He is a recipient of the Natural Science Award from the Ministry of Education (Second Prize, ranked first) and co-authored a key monograph on compressed sensing. He has led major national and provincial research grants and formerly served as the Vice President of the Zhejiang Mathematical Society.*

Date : 17 October 2025 (Friday)
Time : 3:00p.m.-4:00p.m.
Venue : Lecture Theatre F (near Lift 25/26)

All are Welcome!