

The Hong Kong University of Science and Technology

Department of Mathematics

PhD THESIS EXAMINATION

Nonconvex Optimization for Low-rank Matrix Related Problems

By

Miss Zhenzhen LI

<u>ABSTRACT</u>

In this seminar, we will talk about some nonconvex analysis applied to the low-rank matrix related problems via the Riemannian optimization. Firstly, we will introduce some tools we developed to provide the theoretical guarantee for asymptotic escape from strict saddle points and saddle sets. Then, we will also establish fast and near optimal convergence theory for a class of low-rank matrix recovery problems by using Riemannian gradient descent and with random initialization under mild conditions. We are going to reveal some important and intrinsic properties of the low-rank matrix manifold. Finally, we will also reach the topic about how to shape a landscape of a non-convex loss function by using an activation function. This will help with concentration and push the sampling requirements to be optimal, while it also keeps the well-behaved property that all local minima are global minima and all saddles are strict.

Date:	19 Jun 2020, Friday	
Time:	10:00 a.m.	
ZOOM Meeting:	https://hkust.zoom.us/j/91862458604?pwd=S0V	
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	password: 680679	

Thesis Examination Committee:

Chairman	:	Prof. Inchi HU, ISOM/HKUST
Thesis Supervisor	:	Prof. Jianfeng CAI, MATH/HKUST
Member	:	Prof. Yang WANG, MATH/HKUST
Member	:	Prof. Yuan YAO, MATH/HKUST
Member	:	Prof. Haibin SU, CHEM/HKUST
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(Open to all faculty and students)