



MATH-IMS Joint Applied Mathematics Colloquium Series The Chinese University of Hong Kong

This MATH-IMS Joint Colloquium Series is organized by Center for Mathematical Artificial Intelligence (CMAI), under Department of Mathematics and Institute of Mathematical Sciences (IMS) at The Chinese University of Hong Kong. The colloquium series focuses on mathematics and applications of artificial intelligence, big data and related topics.

Date: August 14, 2020 (Friday)

Time: 3pm – 4pm (Hong Kong Time)

Zoom Link: <https://cuhk.zoom.us/j/92775210812>

Landscape analysis of non-convex optimizations in phase retrieval

Speaker: Professor Jian-Feng Cai, HKUST

Abstract: Non-convex optimization is a ubiquitous tool in scientific and engineering research. For many important problems, simple non-convex optimization algorithms often provide good solutions efficiently and effectively, despite possible local minima. One way to explain the success of these algorithms is through the global landscape analysis. In this talk, we present some results along with this direction for phase retrieval. The main results are, for several of non-convex optimizations in phase retrieval, a local minimum is also global and all other critical points have a negative directional curvature. The results not only will explain why simple non-convex algorithms usually find a global minimizer for phase retrieval, but also will be useful for developing new efficient algorithms with a theoretical guarantee by applying algorithms that are guaranteed to find a local minimum.

Bio: Professor Jian-Feng Cai received the B.Sc. and M.Sc. degrees in computational mathematics from Fudan University in 2000 and 2004, respectively, and the Ph.D. degree in mathematics from the Chinese University of Hong Kong in 2007. He is currently a Professor with the Department of Mathematics, Hong Kong University of Science and Technology. His research interests include imaging and data sciences. He has been named as a Highly Cited Researcher in Mathematics by Clarivate Analytics in 2017 and 2018.