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: July 23, 2021 (Friday)
Time: 11:00-12:00 (Hong Kong Time)
Zoom Link: https://cuhk.zoom.us/j/92775210812

Learning to Optimize

Speaker: Wotao Yin
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Abstract: Many applications require repeatedly solving a certain optimization problem, each time with new but similar data. "Learning to optimize" or L2O is an approach to develop algorithms that solve these similar problems very efficiently. L2O-generated algorithms have achieved significant success in signal processing and inverse-problem applications. On LPs, SAT problems, and MIPs, L2O shows promising progress in many aspects. This talk introduces the motivation for L2O and gives a quick overview of different types of L2O approaches for continuous optimization. Then, we will introduce Fixed Point Networks (FPNs), which incorporate fixed-point iterations into deep neural networks and provide abilities such as physics-based inversion, data-driven regularization, encoding hard constraints, and infinite depth. The FPNs are easy to train with a new Jacobian-free backpropagation (JFB) scheme.

Bio: Dr. Yin received his Ph.D. in OR from Columbia University in 2006. Before joining Alibaba US in 2019, he was a Professor in the Department of Mathematics at University of California, Los Angeles. During 2006–2013, he was with the Department of Computational and Applied Mathematics at Rice University. Dr. Yin won the NSF CAREER award in 2008, an Alfred P. Sloan Research Fellowship in 2009, a Morningside Gold Medal in 2016, and a Damo Award in 2021. Dr. Yin's research interests include computational optimization and its applications in signal processing, machine learning and other data science problems. Among his over 200 research publications, Dr. Yin had seven papers co-authored with his students and collaborators that have received the best paper kind of awards. Since 2018, he has been among the top 1% cited researchers by Clarivate Analytics.