



THE HONG KONG UNIVERSITY OF SCIENCE & TECHNOLOGY

Department of Mathematics

MATHEMATICS COLLOQUIUM

A Statistical Perspective of Federated Learning Algorithms and Model Personalization

By

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Abstract

Federated learning is a promising framework with immense potential in privacy preservation and reducing the computation load at the cloud. The successful deployment faces many challenges in both theory and practice such as data heterogeneity and client unavailability. In this talk, I will discuss the resolution from a statistical perspective including the statistical efficiency of FedAvg and FedProx from a nonparametric regression viewpoint, and a new algorithm achieving global convergence when the clients exhibit cluster structure. One notable innovation in our analysis is a uniform estimate on clustering errors, which we prove by bounding the VC dimension of general polynomial concept classes based on the theory of algebraic geometry.

Biography

Pengkun Yang is an assistant professor at the Center for Statistical Science at Tsinghua University. Prior to joining Tsinghua, he was a Postdoctoral Research Associate at the Department of Electrical Engineering at Princeton University. He received a Ph.D. degree (2018) and a master degree (2016) from the Department of Electrical and Computer Engineering at University of Illinois at Urbana-Champaign, and a B.E. degree (2013) from the Department of Electronic Engineering at Tsinghua University. His research interests include statistical inference, learning, optimization, and systems. He is a recipient of Thomas M. Cover Dissertation Award in 2020, and a recipient of Jack Keil Wolf ISIT Student Paper Award at the 2015 IEEE International Symposium on Information Theory (semi-plenary talk).

Date : 20 October 2023 (Fri)

Time : 3:00pm – 4:00pm

Venue : Lecture Theater F (Lifts 25/26)

All Are Welcome!