数学与系统科学研究院

计算数学所网络学术报告

报告人：Assistant prof. Zhenyu Liao

（ Huazhong University of Science and Technology ）

报告题目：

A Random Matrix Approach to Large Dimensional Machine Learning

邀请人： 马俊杰 博士

报告时间：2021 年 7 月 27 日（周二）

上午 10:00-11:00

报告工具：腾讯会议 ID：（160 107 777）

Abstract:

The advent of the Big Data era has triggered a renewed interest for large dimensional machine learning and (deep) neural networks. These methods, being developed from small dimensional intuitions, often behave dramatically different from their original designs and tend to be inefficient when dealing with large dimensional datasets. By assuming both dimension and size of the datasets to be simultaneously large, recent advances in random matrix theory (RMT) provide novel insights and precise performance predictions, allowing for a renewed understanding and the possibility to control and improve machine learning approaches, thereby opening the door to completely new paradigms.

In this talk, we will start with the example of covariance estimation and the "curse of dimensionality" phenomenon in high dimensions, and highlight many counterintuitive phenomena that arise when large dimensional data are considered. By considering the data dimension and/or the machine learning systems to be large, we discuss how RMT is able to provide a renewed understanding and to make precise predictions on many practical problems.

Bio:

Zhenyu Liao received a M.Sc. in Signal and Image Processing in 2016, and a Ph.D. in Computer Science in 2019, both from University of Paris-Saclay, France, where he worked with Prof. Romain Couillet and Prof. Yacine Chitour. In 2020 he was a postdoctoral researcher at University of California, Berkeley, where he worked with Prof. Michael Mahoney. Since 2021 he is an assistant professor with the School of Electronic Information and Communications, Huazhong University of Science and Technology, China. His research interests are broadly in machine learning, signal processing, random matrix theory, and high-dimensional statistics. He is the recipient of the 2021 East Lake Youth Talent Program FellowShip of Huazhong University of Science and Technology, the 2019 ED STIC Ph.D. Student Award and the 2016 Supélec Foundation Ph.D. Fellowship of University of Paris-Saclay, France.

欢迎大家参加！