**THE HONG KONG UNIVERSITY OF SCIENCE TECHNOLOGY**
**Department of Mathematics**

# *MATHEMATICS COLLOQUIUM*

# Integrating Statistical Learning and Deep Learning for Interpretable Analysis of Complex Unstructured Data

By

# Prof. Ke DENG
*Tsinghua University*

## Abstract

The great success of large deep learning models in various applications in recent years have encouraged many researchers to seek improved performance by utilizing larger models and bigger data in practical problems involving unstructured data, leading to psychological implications to pursuit large models everywhere. However, the fundamental principle of statistical modeling tells us that an over-flexible large model without a clear focus on unique features of the problem of interest would often lead to inefficient utilization of data and sub-optimal results. In this talk, I will provide a few examples in analyzing complex unstructured data, including texts, videos and multimodal data, that deep learning can be greatly enhanced by statical learning once we integrate them wisely. We hope these examples could inspire more research efforts on developing advanced statistical approaches with competitive performance and transparent interpretation for analyzing complex unstructured data on top of deep learning.

*Bio:* Ke Deng, Professor and Deputy Head of the Department of Statistics and Data Science at Tsinghua University, Vice Dean of the Interdisciplinary Research Institute for Data Science at Tsinghua University. Professor Deng mainly engages in research on Bayesian statistics and interdisciplinary research with applications in bioinformatics, artificial intelligence, material science and social sciences. He obtained PhD in Statistics from Peking University in 2008, and then joined the Department of Statistics at Harvard University to serve as a Postdoctoral Fellow and later Research Associate, until he joined Tsinghua University in 2013. He has published more than 60 peer-reviewed research papers in leading journals and conferences in statistics and data science, and obtained 19 patents. His academic contributions have been recognized by the Best Paper Awards by the International Congress of Chinese Mathematicians (ICCM) and the Digital Humanities Annual Conference of China, and the Natural Science Award for Outstanding Achievements in University Scientific Research by the Ministry of Education of the People's Republic of China. He was selected into the Youth Project of the National Talent Plan in 2014, was awarded the honorary title of Person of the Year by Scientific Chinese Magazine in 2016, was selected as a Research Fellow of Beijing Academy of Artificial Intelligence in 2018，and was elected as the Elected Member of International Statistical Institute (ISI) in 2024. He is the Associate Editor of "Statistica Sinica" and "Communications in Statistic", and plays a leading role in multiple international and national academic organizations.

**Date** : **10 April 2026 (Friday)**
**Time** : **3:00pm - 4:00pm**
**Venue** : **Lecture Theatre F (Lift 25/26)**
*All Are Welcome!*