深圳北理莫斯科大学

应用数学讲座

Научный Семинар по Прикладной Математике
Research Seminar on Applied Mathematics

应用数学报告（93）

报告人 / Докладчик / Speaker: Zhigang Yao，National University of Singapore

题目 / Название / Title: Manifolds in Machine Learning and Beyond

时间 / Время / Time：2023.12.08, 9:00-11:30；14:00-16:00

地点 / Место / Venue: 主楼336

摘要 / Аннотация / Abstract:

Manifold fitting, which offers substantial potential for efficient and accurate modeling, poses a critical challenge in non-linear data analysis. This study presents a novel approach that employs neural networks to fit the latent manifold. Leveraging the generative adversarial framework, this method learns smooth mappings between low-dimensional latent space and high-dimensional ambient space, echoing the Riemannian exponential and logarithmic maps. The well-trained neural networks provide estimations for the latent manifold, facilitate data projection onto the manifold, and even generate data points that reside directly within the manifold.

Zhigang Yao 简介：

Zhigang Yao is an Associate Professor in the Department of Statistics and Data Science at the National University of Singapore (NUS). He also holds a courtesy joint appointment with the Department of Mathematics at NUS. He is a Faculty Affiliate of the Institute of Data Science (IDS) at NUS. He received his Ph.D. in Statistics from University of Pittsburgh in 2011. His thesis advisors are Bill Eddy at Carnegie Mellon and Leon Gleser at University of Pittsburgh. He has been an Assistant Professor at NUS from 2014-2020. Before joining NUS, he has been

working with Victor Panaretos as a post-doc researcher at the Swiss Federal Institute of Technology (EPFL) from 2011-2014.

From 2022, he has been a Member of the Center of Mathematical Sciences and Applications (CMSA) at Harvard University.　At Harvard, he collaborates with Shing-Tung Yau on manifold fitting and research the interface between statistics and geometry. He is also a Visiting Faculty in the Department of Statistics at Harvard. He is the organizer of the Harvard Conference on Geometry and Statistics, hosted by CMSA in 2023.