



深圳北理莫斯科大学

УНИВЕРСИТЕТ МГУ-ППИ В ШЭНЬЧЖЭНЕ

SHENZHEN MSU-BIT UNIVERSITY

应用数学讲座

Научный Семинар по Прикладной Математике

Research Seminar on Applied Mathematics

应用数学报告 (69)

报告人 / Докладчик / Speaker: 姚志刚 教授 (新加坡国立大学)

题目 / Название / Title: Principal flow, sub-manifolds and boundary

时间 / Время / Time: 2 Nov. 2022, 9:00-12:00

地点 / Место / Venue: 腾讯会议: 326-877-543 会议密码: 777777

摘要 / Аннотация / Abstract:

While classical statistics has dealt with observations which are real numbers or elements of a real vector space, nowadays many statistical problems of high interest in the sciences deal with the analysis of data which consist of more complex objects, taking values in spaces which are naturally not (Euclidean) vector spaces but which still feature some geometric structure. I will discuss the problem of finding principal components to the multivariate datasets, that lie on an embedded nonlinear Riemannian manifold within the higher-dimensional space. The aim is to extend the geometric interpretation of PCA, while being able to capture the non-geodesic form of variation in the data. I will introduce the concept of a principal sub-manifold, a manifold passing through the center of the data, and at any point on the manifold extending in the direction of highest variation in the space spanned by the eigenvectors of the local tangent space PCA. We show the principal sub-manifold yields the usual principal components in Euclidean space. We illustrate how to find, use and interpret the principal sub-manifold, by which a principal boundary can be further defined for real data sets on manifolds.

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Yao Zhigang 是新加坡国立大学 (NUS) 统计系副教授兼终身教授, 研究重点是统计和几何的交互, 特别非欧式空间数据及流行学习。他现为哈佛大学数学科学与应用中心成员, 哈佛大学统计系访问教授, 也曾作为特邀客座教授访问瑞士洛桑联邦理工大学 (EPFL) 等高校。

访问学者以及需要做报告的学者请联系 张晔 教授 / Всем желающим выступить с докладами на семинаре просьба обращаться к Чжану Е ye.zhang@smbu.edu.cn