



THE UNIVERSITY OF CHICAGO

COMPUTATIONAL AND APPLIED MATHEMATICS COLLOQUIUM

TINGRAN GAO
Department of Statistics
The University of Chicago

Manifold Learning on Fibre Bundles

THURSDAY, May 16, 2019, at 4:00 PM
Jones 226, 5747 South Ellis Avenue

ABSTRACT

Spectral geometry has played an important role in modern geometric data analysis, where the technique is widely known as Laplacian eigenmaps or diffusion maps. In this talk, we present a geometric framework that studies graph representations of complex datasets, where each edge of the graph is equipped with a non-scalar transformation or correspondence. This new framework models such a dataset as a fibre bundle with a connection, and interprets the collection of pairwise functional relations as defining a horizontal diffusion process on the bundle driven by its projection on the base. The eigenstates of this horizontal diffusion process encode the “consistency” among objects in the dataset, and provide a lens through which the geometry of the dataset can be revealed. We demonstrate an application of this geometric framework on evolutionary anthropology.

Organizers:

Daniel Sanz-Alonso, Department of Statistics, sanzalonso@uchicago.edu
CAM Colloquium URL: <https://cam.uchicago.edu/seminars/colloq/index.shtml>.

For further information and inquiries about building access for persons with disabilities, please contact Zellencia Harris, zellenciah@uchicago.edu. If you wish to subscribe to our email list, please visit the following website: https://lists.uchicago.edu/web/subscribe/cam_colloquium/.