THE UNIVERSITY OF HONG KONG

Department of Mathematics

C O L L O Q U I U M

Understanding manifold-structure data via geometric modeling and learning

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Abstract

Analyzing and inferring the underlying global intrinsic structures of data from its local information are critical in many fields. In practice, coherent structures of data allow us to model data as low dimensional manifolds, represented as point clouds, in a possible high dimensional space. Different from image and signal processing which handle functions on flat domains with well-developed tools for processing and learning, manifold-structured data sets are far more challenging due to their complicated geometry and representation ambiguities. To overcome these ambiguities, I will first discuss modeling based methods. This approach uses geometric PDEs to adapt the intrinsic manifolds structure of data and extracts various invariant descriptors to characterize and understand data through solutions of differential equations on manifolds. Inspired by recent developments of deep learning, I will also discuss our recent work of a new way of defining convolution on manifolds and demonstrate its potential to conduct geometric deep learning on manifolds. This geometric way of defining convolution provides a natural combination of modeling and learning on manifolds. It enables further applications of comparing, classifying and understanding manifold-structured data by combing with recent advances in deep learning.

Date:	**December 4, 2018 (Tuesday)**
Time:	**11:00am – 12:00noon**
Venue:	**Room 210, Run Run Shaw Bldg., HKU**

All are welcome