國家理論科學研究中心

IAMS / NCTS Applied Math Seminar

Speaker: **Mr. Yen-Chi Chen (Department of Statistics, Carnegie Mellon University)**

Title: **Statistical Inference for Shards**

Abstract:

Shards are low dimensional structures in the ambient space that represent high density regions. Some common examples for shards include density level sets, density local modes and density ridges. Detection of shards from a given data is important in scientific research. For instance, in cosmology, galaxy clusters are like density local modes and the cosmic filaments, one dimensional high density curves, can be modeled as density ridges and regions below certain density level can be used to trace the voids—the vast part of the Universe with only a few matters. Studying the shards in the Universe helps cosmologists to understand how the Universe evolves and allows us to test the existing cosmological models.

Although a huge amount of literatures have discussed the consistency for estimating the shards, very few of them consider making statistical inference. In this talk, we focus on statistical inference for three types of shards: the density level sets, the density ridges and the modal regression. The modal regression is a variant of the usual regression that instead of looking for the conditional expectation, we aim at the conditional local modes--shards in a regression setting. We will show (1) the limiting distribution for estimating the shards, (2) the valid confidence sets for the shards, and (3) how to interpret the results.

Time: **May 27 (Wed.) 13:20 – 14:20**

Venue: **Rm 202, NCTS (Astro-Math Bldg., NTU Campus)**

Organizer: **Jenn-Nan Wang (NTU)**

For more information, please refer to http://www.cts.ntu.edu.tw/,
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