

A Bridge between High-dimensional Data to Functional Data: Application to Functional Cox Model

Jane-Ling Wang

University of California, Davis

Abstract

There is a close relation between high-dimensional data and functional data. For instance, densely observed functional data can be viewed as high-dimensional data endowed with a natural ordering. In this talk, we explore the opposite question whether one can find a proper ordering of high-dimensional data so they can be reordered and viewed as functional data.

Stringing is such a method that takes advantage of the high dimensionality by representing such data as discretized and noisy observations that originate from a hidden smooth stochastic process. It transforms high-dimensional data to functional data so that established techniques from functional data analysis can be applied for further statistical analysis. We illustrate the advantage of the stringing methodology through several data sets. In one of the applications, stringing leads to the development of a new Cox model that accommodates functional covariates. Theoretical properties of the proposed functional Cox model will be explored in the second part of the talk.

*Based on joint work with Kun Chen (GE Healthcare), Kehui Chen (U. Pittsburgh), Hans-Georg Mueller (UC Davis), Simeng Qu and Xiao Wang (both from Purdue U.)