

**Indiana University-Purdue University
Indianapolis**
Department of Mathematical Sciences

STATISTICS SEMINAR

12:30pm—1:30pm, Tuesday, April 18, 2023
Zoom Meeting: Meeting ID: 845 0989 4694

Speaker: Ping-Shou Zhong

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University of Illinois Chicago*

Title: Inter-Subject Correlation Analysis for Heterogeneous
Functional Data

Abstract:

A focus of the inter-subject correlation (ISC) analysis is to understand the correlation among individuals' brain activities to identify the brain regions that respond similarly to the same real-life stimuli. It plays an important role in neuroscience research. This paper aims to develop a consistent test for the ISC analysis with fMRI data. We explore the benefit of using nonparametric smoothing in the ISC test and propose a nonparametric test procedure for testing the existence of the inter-subject correlation. More specifically, testing whether the covariance matrix among subjects is diagonal. Our proposed test is applicable under subject heteroscedasticity and temporal heteroscedasticity. We establish the asymptotic distributions of the proposed test statistics under the null hypothesis and a series of local alternative hypotheses. Numerical studies show that the proposed test procedure performs better than the commonly used methods in the ISC studies and cross-sectional dependence tests including the adjusted Lagrange multiplier test, Pesaran's cross-sectional dependence (CD) test, and the adjusted Pesaran's CD test.

Bio:

Dr. Ping-Shou Zhong is an Associate Professor in the Department of Mathematics, Statistics, and Computer Science at the University of Illinois Chicago. He got his PhD in Statistics from Iowa State University in 2011. Dr. Zhong's research interests focus on High dimensional statistical inference, Statistical analysis for longitudinal and functional data, Empirical likelihood method, Nonparametric smoothing methods and Missing data problems.