

DEPARTMENT OF STATISTICS

Bhaswar BhattacharyaWharton Statistics Department
University of Pennsylvania*Detection Thresholds for Non-Parametric Tests
Based on Geometric Graphs: The Curious Case of
Dimension 8***September 11, 2019****11:45am – 12:45pm**

Light refreshments will be served

**110 Frelinghuysen Road
Hill Center, Room 552**

Abstract: Two of the fundamental problems in non-parametric statistical inference are goodness-of-fit and two-sample testing. These two problems have been extensively studied and several multivariate tests have been proposed over the last thirty years, many of which are based on geometric graphs. These include, among several others, the celebrated Friedman-Rafsky two-sample test based on the minimal spanning tree and the K-nearest neighbor graphs, and the Bickel-Breiman spacings tests for goodness-of-fit. These tests are asymptotically distribution-free, universally consistent, and computationally efficient (both in sample size and in dimension), making them particularly attractive for modern statistical applications.

In this talk, we will derive the detection thresholds and limiting local power of these tests, thus providing a way to compare and justify the performance of these tests in various applications. Several interesting properties emerge, such as a curious phase transition in dimension 8, and a remarkable blessing of dimensionality in detecting scale changes.

Bio: Bhaswar B. Bhattacharya is an Assistant Professor in the Department of Statistics at the Wharton School, University of Pennsylvania. He received his Ph.D. from the Department of Statistics at Stanford University in 2016. Prior to that, he obtained his Bachelor and Master's degrees in Statistics from the Indian Statistical Institute, Kolkata in 2009 and 2011, respectively. His research interests include non-parametric statistics, combinatorial probability, and discrete and computational geometry.

