

Multivariate Control Quantile Test Based on Triangle Data Depth

Zhenyu Liu and Reza Modarres
Department of Statistics
The George Washington University
2140 Pennsylvania Ave. NW
Washington, D.C. 20052

Abstract

Over the last two decades, various notions of data depth have emerged as powerful explanatory and inferential tools for nonparametric multivariate analysis. The notion of data depth provides a center-outward ordering of multivariate observations with respect to a distribution function F or a data cloud in R^d . In this talk, I will first review the concept of data depth and propose a new data depth, called triangle data depth. I will show that the triangle data depth possess the four desirable properties of statistical depth functions and the sample triangle data depth enjoys computational simplicity in high dimension settings and it is strongly and uniformly convergent. Then, I will extend the univariate control quantile test for testing of equality of distribution functions in high dimensions using triangle data depth. The performance of the test based on different notions of data depth is examined through a simulation study.