Gervini, Daniel
Outlier detection and trimmed estimation for general functional data. (English)
Stat. Sin. 22, No. 4, 1639-1660 (2012).

Summary: This article introduces trimmed estimators for the mean and covariance function of general functional data. The estimators are based on a new measure of “outlyingness” or data depth that is well defined on any metric space, although we focus on Euclidean spaces. We compute the breakdown point of the estimators and show that the optimal breakdown point is attainable for the appropriate choice of the tuning parameters. The small-sample behavior of the estimators is studied by simulations, and we show that they have better outlier-resistance properties than alternative estimators. This is confirmed by two data applications that also show that the outlyingness measure can be used as a graphical outlier-detection tool in functional spaces where visual screening of the data is difficult.

MSC:
62G05 Nonparametric estimation
62G35 Nonparametric robustness
65C60 Computational problems in statistics (MSC2010)

Keywords:
breakdown point; data depth; robust statistics; stochastic processes

Software:
robustbase

Full Text: arXiv Link