Nonparametric methods for directional data

Eduardo García–Portugués (University of Copenhagen)

Joint work with I. Van Keilegom, R. M. Crujeiras and W. González–Manteiga

In this talk we will introduce two nonparametric inference methods for directional data, that is, for data observed on a hypersphere. Prior to that, a short introduction to the applications of this kind of data and the statistical methods to deal with it will be sketched. Afterwards, we will present a nonparametric estimator of the regression function with linear response and directional predictor, together with its asymptotic properties. Based on the nonparametric estimator, a test for parametric regression functions will be constructed using a weighted squared distance with respect to the smoothed parametric estimate. The asymptotic distribution and power of the test statistic will be discussed, as well as a consistent resampling procedure for the practical calibration of the test. The performance of the method will be illustrated in a simulation study and applied to analyze datasets from forest science, astronomy and text mining.