W. González-Manteiga
Statistical Inference with synthetic functional data derived from point processes with applications

Abstract. A common question when a given point process is observed in more than one population is whether those patterns share the same structure or they can be partitioned in a certain number of groups. To address this issue, recent advances on nonparametric inference for point processes are needed. In this talk we focus on kernel estimators of the first-order intensity and nonparametric tests for comparison of two point patterns. Moreover, clustering algorithms, such as the k-means, can be used to classify a number of observed point patterns into groups. To tackle this problem we move from the point process framework with intensity functions, to the space of density functions. We describe the particularities of this space, and analyze the requirements, implementation and limitations of the k-means algorithm for classification of density functions. The methodology presented is applied to different real data problems: COVID-19 infections and deaths in Spain, wildfires in Galicia (north-west Spain) and crime events in Rio de Janeiro (Brazil).