UNIVERSIDAD DE GRANADA

Máster Universitario en
Estadística Aplicada

Conferencia María Isabel Borrajo García

25/10/2024

PONENTE: María Isabel Borrajo García, Universidad de Santiago de Compostela

TÍTULO: point processes on linear networks: foundations, challenges and applications

FECHA Y HORA: 31 de octubre a las 16:00-20:00

Summary

Point processes on linear networks have gained significant attention in recent years due to their broad applications across various fields. Data sets representing the spatial locations of a series of events arise in a wide range of scenarios, such as trees in a forest, earthquakes in a region, or traffic accidents on road networks. While the former are examples of spatial point processes in two- or three-dimensional Euclidean spaces, the latter represent point patterns constrained to a one-dimensional subset within a Euclidean plane, known as a linear network. This talk introduces the foundational concepts of point processes on linear networks, highlighting how they differ from traditional spatial point processes on planar domains. We will explore the mathematical framework, focusing on key properties and the unique challenges posed by the structure of linear networks, such as roads or rivers. In addition, we will examine practical applications, particularly the modelling of traffic accidents.

A widely studied problem in statistics is population comparison, which involves determining whether two (or more) samples originate from the same stochastic process. This problem also arises in the context of point processes on linear networks, such as comparing car-to-car versus car-to-motorcycle collisions. We will present two specific testing methods: Kolmogorov-

Smirnov and Cramér-von Mises-type test statistics. A comprehensive simulation study is conducted to evaluate the finite sample performance of these methods, which will also be applied to real-world data on traffic collisions in Rio de Janeiro, Brazil

Short biography

María Isabel Borrajo (Narón, 1989) es Profesora Contratada Doctora en el Departamento de Estadística, Análisis Matemático y Optimización de la Universidad de Santiago de Compostela. Obtuvo su doctorado en Matemáticas en febrero de 2018, con la tesis titulada "Nonparametric inference on point processes with covariates". Fue Profesora Interina de Sustitución en el Departamento de Estadística de la Universidad de Oviedo durante el curso 2017/2018 y desde septiembre de 2018 trabajó como investigadora posdoctoral en la Universidad de Lancaster (Reino Unido). Las líneas de investigación en las que trabaja actualmente son la inferencia no paramétrica y los procesos puntuales