



Statistics and Actuarial Science Seminar

Title: Uncovering dynamic textual topics that explain crime

Speaker: Seppo Virtanen (University of Leeds)

Date: Mon 11th April 2022 at 12:00PM

Location: Online

Abstract: Crime analysis/mapping techniques have been developed and applied for crime detection and prevention to predict where and when crime occurs, leveraging historical crime records over a spatial area and covariates for the spatial domain. Some of these techniques may provide insights for understanding crime and disorder, especially, via interpreting the weights for the spatial covariates based on regression modelling. However, to date, the use of temporal covariates for the time domain has not played a significant role in the analysis. In this work, we collect time-stamped crime-related news articles, infer crime topics or themes based on the collection and associate the topics with the historical numeric crime counts. We provide a proof-of-concept study, where instead of adopting spatial covariates, we focus on temporal (or dynamic) covariates and assess their utility. We present a novel joint model tailored for the crime articles and counts such that the temporal covariates (latent variables, more generally) are inferred based on the data sources. We apply the model for violent crime in London.

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