{php} $id=315;include("FILES/NOTICIA_SEMINAR.php");{/php}

Keywords:
Crime, Gaussian random fields, Log-Gaussian Cox processes, Nonstationarity, Spatio-temporal point patterns, Surveillance

Abstract:
Surveillance systems have their origins in industrial applications, where the name refers to the routine collection and analysis of data for quality control purposes. More recently, the increasing need for early detection of disease outbreaks to inform prevention and control policies has given rise to an extensive literature on public health surveillance systems. Surveillance methods have been developed for other areas of application, for example, to detect acts of bioterrorism. Our motivation is from criminology, in particular prediction of crime events, and detection of emergent clusters in the spatio-temporal distribution of such crimes.

We propose a method for conducting likelihood-based inference for a class of nonstationary spatio-temporal log-Gaussian Cox processes. We derive an approximate conditional likelihood function for spatio-temporal log-Gaussian Cox processes. The method uses low-rank convolution-based models to capture the spatio-temporal correlation structure, to alleviate the computational burden involved in applying likelihood-based methods to full rank models.
We describe an application to a surveillance system to model the spatio-temporal distribution of crime events with the aim of predicting and detecting emergent spatio-temporal clusters of crime events.

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