Spatial Modelling It's use in predictive policing

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- 2 Spatial data
 (Spatial) Modelling
- O What modelling offers
- A case study
 The Modelling procedure



STOP GLOBAL WARMING: BECOME A PIRATE



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Statistics

- A type of mathematical analysis involving the use of quantified representations, models and summaries for a given set of empirical data or real world observations.
- Statistical analysis involves the process of collecting and analyzing data and then summarizing the data into a numerical form.

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Income Index of Deprivation for London in 2010



EXPLORE THE LONDON BLITZ during 7th October 1940 to 6th June 1941



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- Spatial auto-correlation has to be accounted for to avoid wrong inference and hence wrong conclusions

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- Identify clusters in space
- Understand why clusters in space occur
- Local scale interaction (attract, repulse)

• Model the spatial and or temporal dependence

• Model phenomena that vary both in time and across space

• Investigating the interaction between time and space



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5 Discussion...



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Estimation of latent process



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Spatial Modelling

Uncertainty



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• Observed data; Independent given the latent process

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- Latent process; "Driver" of the observations

$\eta_i = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \dots + \beta f(x_{s,t})$

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The Stochastic process through time

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- Need to have some "structure" which accounts for the spatial and temporal dependence between the crimes
- Want to correctly identify variables affecting "crime rates"
- Want to explain as much of the "variation" in the data as possible
- Development of spatio-temporal modelling techniques.....

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"The development of new statistical methods for analysing crime patterns and predicting their occurrence in space and time. The outputs from such work have important implications for efficient and effective police deployment and crime prevention." What is of interest? What questions are there? What is the desired outcome? What are the envisaged benefits?

Further questions

