spatstat: An R package for analysing spatial point patterns

Presenters

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About spatstat

spatstat is a package for analysing spatial point patterns. It supports a complete statistical analysis of spatial point pattern data: data input and inspection, calculations, plotting, exploratory data analysis, hypothesis tests, model-fitting, simulation, Monte Carlo methods and model diagnostics. Numerous other packages for spatial analysis depend on spatstat and extend its capabilities.

spatstat is the result of over 20 years' development and is one of the most extensive contributed packages available for R, with a 1300-page manual. Recent development has accelerated and the package is now 3 times larger than in 2010.

Goals

- Understand basic statistical concepts used in spatial point pattern analysis.
- Get an overview of the capabilities of spatstat and how to find your way around.
- Learn how to conduct a basic analysis of a point pattern dataset:
- Calculating and plotting exploratory summaries.
- Fitting Poisson, Cox, and Gibbs point process models.
- Validating and critiquing fitted models.

Contents

- All the content is based on hands-on exercises.
- We begin with real examples and establish basic principles.
- We introduce relevant graphical/exploratory methods including nonparametric intensity estimation, pair correlation, Ripley's K-function.
- We demonstrate model building, model-fitting, formal inference and model validation.

Importance

- Spatial point pattern datasets are becoming more common across many fields of research. However, statistical methodology for analysing these data has not been widely disseminated.
- spatstat is one of the few packages supporting a full analysis based on sound statistical principles.
- spatstat has greatly expanded in the last few years, so a quick brush-up and introduction to new capabilities is very relevant.

Requirements

- Basic familiarity with R.
- Basic familiarity with statistical concepts.
- Please bring your own laptop, with the latest version of R and spatstat installed. Please ensure that all the 'Suggested' packages for spatstat are also installed.

Potential attendees

- Researchers in any field, working with spatial point pattern data.
- useRs with an interest in spatial data analysis.
- Current spatstat users and package developers wanting a broader knowledge of spatstat's new capabilities.