university of groningen / faculty of spatial sciences

Spatial Analysis and mapping using R workshop schedule

Pre-Workshop Homework

You should work through the *Session0* (`Session0.html`) worksheet **before** the workshop. This will introduce R and some core operations.

Day 1: Monday 7th May, zaal 5415.0042 (09:30-17:00, with a break for lunch)

Session 1: *Introduction*

Prof Lex Comber, University of Leeds

- **Talk** why use R / RStudio.
- This session will cover loading data, saving projects, using, saving and calling scripts, data exploration including basic boxplots, histograms, scatter plots and summary statistics.

Session 2: *Regression I*

Prof Chris Brunsdon, Maynooth University

- **Talk** basics of Regression in R.
- This session will use some UK census data to develop some simple OLS regressions. It will cover model selection, residuals, identifying outliers.

Session 3: *Visualisations with `ggplot2`*

Prof Lex Comber, University of Leeds

- **Talk** Simple Visualisations
- This session will introduce participants to the more sophisticated graphical data summaries extending the simple plot functions from session 1 to ggplot2 (based on the Grammar of Graphics).

Day 2: Tuesday 8th May, zaal 5415.0041 (09:00-13:00 & 15:00-17:00) & zaal 5415.0042 (13:00-15:00)

Session 4: *Introduction to Spatial Data and Mapping*

Prof Lex Comber, University of Leeds

- **Talk** Spatial data formats and mapping in R.
- This session will introduce both the sp and sf spatial data formats, will demonstrate how to read and write spatial data into R, some simple Choropleth mapping using the tmap package and will apply and introduce some basic cluster analysis (Moran's I, G-statistic).

Session 5: *Other Forms of Regression*

Prof Chris Brundson, Maynooth University

- **Talk** Introduction Poisson Regression, GWR and other variations
- This session will extend the idea of ordinary least squares regression to a number of variants. Key extensions will be to model count data (Poisson regression) and to allow for spatial variability in relationships (Geographically Weighted Regression).

Lecture*: Progress in applied retail location modelling*

Prof Graham Clarke, University of Leeds

Session 6: *Spatial Interaction Models - A Poisson Regression Approach*

Prof Chris Brunsdon, Maynooth University

- **Talk** Using R for Spatial Interaction Modelling
- This session will apply Poisson regression approaches to spatial data, using a retail demand and supply data set for Groningen. It will use models with different options for the row and column constraints – and demonstrate how results can be mapped.

Day 3: Wednesday 9th May, zaal 5412.0039 (11:15-13:00) & zaal 5415.0032 (14:00-17:00)

11:15 – 13:00 5412.0039 (11:15-13:00)

Lecture: *Cross-national Comparisons of Internal Migration* (Prof John Stillwell, University of Leeds)

14:00 – 17:00 5415.0032 (14:00-17:00)

Session 7 - Q&A / practice