Applied Statistics (Michaelmas and Lent (24))
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This course is split over two terms, with 16 hours (8 lectures and 8 practical classes) in the Michaelmas Term and 8 hours (4 lectures and 4 practical classes) in the Lent Term. It is a practical course aiming to develop skills in analysis and interpretation of data. The practical classes will deal with an introduction to R, exploratory data analysis (data visualization and dimensional reduction) and the implementation of the statistical methods discussed in the lectures. We aim to cover a selection of the following topics:

- Generalised linear models and quasi-likelihood methods.
- Non parametric regression, generalized additive models, introduction to functional data analysis.
- Mixed effects models and longitudinal data.
- Empirical and parametric bootstrap.
- Time series: spectral analysis, ARMA models and forecasting.
- Basics of spatial statistics.

Pre-requisites

Elementary probability theory. Maximum likelihood estimation, hypothesis tests and confidence intervals. Linear models.

Previous experience with R is helpful but not essential.

Literature


Additional support

This course includes practical classes in both the Michaelmas and Lent Terms, where statistical methods are introduced in a practical context and where students carry out analysis of datasets using R. In practical classes, the students have the opportunity to discuss statistical questions with the lecturer. Four examples sheets will be provided and there will be four associated examples classes. There will be a revision class in the Easter Term.