Generalized Linear Mixed Models

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Course Description

This course provides an introduction to Generalized Linear Models (GLM) and its extension to mixed-effects (hierarchical) models. Relevant theoretical results will be reviewed and practical issues arising in modeling complex data (i.e., correlated or clustered data) will be considered.

Objectives

The objectives of this course are:

- To learn (or review) basic theoretical results about inference for generalized linear and mixed-effects models.
- To understand how to build, fit and interpret GLMMs
- To fit hierarchical models to some real datasets by using R and Bugs.

Schedule

5	May	10.00-13.00	Introduction to the course: basic ideas on generalized linear models (Torelli)
19	May	10.00-13.00	Models for binary, multinomial and count data: some important applications of GLMs (Torelli)
5	June	10.00-13.00 and 14.30-17.30	Overdispersion in GLMs and introduction to hierarchical models and to GLMMs (Torelli)
18	June	10.30-13.00	Likelihood inference in GLMMs (Bellio - Udine)
		15.00-17.30	Practical session with R (Bellio)
19	June	10.30-13.00	Bayesian Hierarchical Models (Trevisani- Trieste)
		15.00-17.30	Practical session with R-Bugs (Trevisani)
20	June	10.00-12.00	Introduction to (generalized) additive mixed models (Pauli- Trieste)
		15.00-17.00	Practical session with R (Pauli)

Recommended texts

- Mc Cullagh, P & Nelder J.A. (1989) *Generalized Linear Models*, Chapman & Hall, New York.
- Gelman, A. & Hill J. (2007), *Data Analysis Using Regression and Multilevel/Hierarchical Models*, Cambridge University Press, NY.
- Fahrmeir L., Tutz, G. (2001) *Multivariate Statistical Modelling Based on Generalized Linear Models*, Springer, New York. Chapter 6.

Final Exam July, 21, h:10.00