ACADEMIA TERRA

Capacitação para Investigadores

17 - 21 MARCH 2025
9 - 16h (Friday 9 - 13h)

Total of 25 hours of course
In person and online
Max. onsite participants: 30
Language: English

Introduction to GLLVM
- with spatial or temporal dependency -

OBJECTIVES

This course offers a journey through classical multivariate analysis techniques, progressing into advanced, recently developed tools for multivariate generalised linear models (GLM) and generalised linear mixed models (GLMM).

TRAINERS

ALAIN ZUUR | Highland Statistics Ltd
ELENA IENO | Highland Statistics Ltd

DESCRIPTION AND SCHEDULE

17.3.2025 | • GENERAL INTRODUCTION;
• THEORY PRESENTATION ON PRINCIPAL COMPONENT ANALYSIS (PCA) AND REDUNDANCY ANALYSIS (RDA);
• EXERCISE ON PCA AND RDA;
• THEORY PRESENTATION ON GENERALISED LINEAR LATENT VARIABLE MODELS (GLLVM).

18.3.2025 | • CATCHING UP;
• TWO EXERCISES ON GLLVM USING POISSON AND NEGATIVE BINOMIAL MODELS FOR COUNT DATA.

19.3.2025 | • THEORY PRESENTATION ON CONSTRAINED GLLVM (REDUCED RANK REGRESSION AND CONCURRENT ORDINATION);
• TWO EXERCISES ON CONSTRAINED GLLVM.

20.3.2025 | • WE WILL APPLY EXERCISES USING GLLVM WITH VARIOUS DISTRIBUTIONS, INCLUDING TWEEDIE, GAMMA, BERNOULLI, GAUSSIAN, AND BETA. WHILE WE MAY NOT COVER ALL THESE DISTRIBUTIONS DURING THE COURSE, SOLUTION FILES WILL BE PROVIDED.

21.3.2025 | • ADDING SPATIAL AND TEMPORAL DEPENDENCY STRUCTURES TO GLLVM.

PREPARATION MATERIAL
(with on-demand video)

- EXERCISE ON LINEAR REGRESSION
- EXERCISE ON POISSON / NEGATIVE BINOMIAL GLM
- EXERCISE ON POISSON / NEGATIVE BINOMIAL GLMM
- MATRIX NOTATION
- WHAT IS A VARIOGRAM
- DHARMA FOR MODEL VALIDATION

REGISTRATION

HTTP://HIGHSTAT.COM/INDEX.PHP/COURSES
HIGHSTAT@HIGHSTAT.COM

TERRA

Fundação para a Ciência e a Tecnologia

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MORE INFORMATION

- We begin with classical multivariate techniques such as principal component analysis (PCA) and redundancy analysis. From there, we transition into generalised linear latent variable models (GLLVM), a powerful approach for analysing multiple response variables simultaneously. GLLVMs account for dependencies among response variables and between observations, providing a flexible framework for complex data.
- The course also covers extensions of GLLVMs, including reduced rank regression (constrained latent variables), concurrent ordination and models that incorporate spatial or temporal dependency structures.
- This is an applied and non-technical course that focuses on the practical implementation in R.
- Please ensure that you have system administration rights to install R, and R packages on your computer. Instructions what to install is on the course website

INCLUDED

The course includes a 1-hour face-to-face video chat with the instructors (to be used after the course). The meeting needs to take place within 12 months after the course. You can discuss your own data, but we strongly advice that the statistical topics are within the content of the course. The 1-hour needs to be consumed in one session, and will take place at a mutual convenient time.

COURSE PRICE

330 GBP (aprox. 400 €) - TERRA members [first 5 registrations will be free upon expression of interest];
425 GBP (aprox. 510 €) - for externals and online participants

Credit card payments are charged in GBP currency.
VAT Charge:

- EU participants who do not provide a VAT number will be charged VAT at their national rate.
- We do not charge VAT to EU participants who provide their institutional VAT number.
- The fee does not contain coffee, tea, lunch or accommodation.
- Access to the course website is 12 months.

CANCELLATION POLICY

Once participants are given access to exercises with R solution codes, pdf files of certain book chapters, and pdf files of presentations, all fees are non-refundable. However, if you are unable to attend, we may be able to offer you a slot in a future course.

PRE-REQUIRED KNOWLEDGE

Participants should be familiar with data exploration, linear regression and basic GLM and GLMM (i.e. Poisson and negative binomial GLM) in R. The course website contain revision/preparation material with on-demand videos covering these topics.

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