Format: Hybrid (onsite and online)

The World of Zero-Inflated Models -Using GLMs, GLMMs and multivariate GLMMs

Organised by: Highland Statistics Ltd

Key components:

- Analysis of count data, continuous data and proportional data with an excessive number of zeros.
- Applying zero-inflated Poisson, negative binomial, generalised Poisson, Tweedie, binomial, beta and ordered beta GLMs and GLMMs using glmmTMB. Applying hurdle models using glmmTMB.
- Analysing zero-inflated multivariate response variables using generalised linear latent variable models (GLLVM).

The course begins with a brief review of Poisson and negative binomial GLMs. After presenting the theory on how these models can be extended to zero-inflated models, we will apply them to various datasets.

In the second part of the course, we will utilise GLMMs to analyse zero-inflated data. In the third part, we will use GLLVMs to analyse multiple species.

Dates:
- 7 - 11 October 2024
- 09.00 - 16.00

Location: Newburgh, Aberdeenshire, UK

Price: £525

Included: 1 hour face-to-face video chat about your data

Instructors:
- Dr. Alain Zuur
- Dr. Elena Ieno

Authors of 12 books and providers of over 250 courses

Throughout the course, we will use the glmmTMB package for zero-inflated GLMs and GLMMs, and the gllvm package for multivariate GLMMs.

This is an onsite course, but you can also participate online via a Zoom connection (same price).

Interaction between participants and instructors after the course:

- The course fee includes a 1-hour face-to-face video chat with the instructors. You can ask questions related to your own data or to the course.
- A Discussion Board allows for interaction between instructors and participants. You can ask detailed questions related to the course material.

COURSE CONTENT

Preparation material with on-demand video
- Exercise on linear regression.
- Exercise on Poisson and negative binomial GLM, and Bernoulli GLM.
- Exercise on linear mixed-effects models.

Module 1 (Monday)
- General introduction.
- One exercise revising basic GLMs.
- Model validation using DHARMa.
- Theory presentation on zero-inflated models.

Module 2 (Tuesday)
- Two exercises using zero-inflated GLMs for the analysis of data sets with an excessive number of zeros in the count data.
- Exercise using a zero-inflated Poisson GLMM to analyse count data.

Module 3 (Wednesday)
- Exercise using a zero-inflated negative binomial GLMM to analyse count data.
- Exercise using a beta GLMM and ordered beta GLMM to analyse zero-inflated proportional data.
- Exercise using a Tweedie GLMM to analyse continuous data with an excessive number of zeros.

Module 4 (Thursday)
- Catching up
- Exercise using hurdle models for the analysis of zero-inflated count data.
- Exercise using a zero-altered Gamma GLMM to analyse continuous data with an excessive number of zeros.
- Time allowing: Exercise using a zero-inflated binomial GLMM to analyse proportional data.

Module 5 (Friday)
- Theory presentation: Generalised linear latent variable models (GLLVM) for the analysis of data sets with multiple response variables.
- Exercise showing how to apply a GLLVM to count data.
- Exercise showing how to apply a GLLVM to zero-inflated count data.

We reserve the right to change the exercises. Pdf files of all theory material will be provided. All exercises consists of data sets and annotated R scripts. Access to the course website is for 12 months. The Monday-Friday material does not contain on-demand video. For terms and conditions, see:
https://www.highstat.com/index.php/component/hikashop/checkout/termsandconditions/step-3/pos-6/tmpl-component

PRE-REQUIRED KNOWLEDGE:
Working knowledge of R, data exploration, linear regression, GLM (Poisson, negative binomial, Bernoulli) and linear mixed-effects models. The course website provides preparatory materials, including on-demand videos and R scripts covering these topics. If you are not familiar with these methods, please review them before the course begins.

GENERAL
- 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.

GENERAL INFORMATION

Access to the course website is 12 months.

COURSE FEE: £525

- Credit card payments are charged in GBP currency.
- Onsite participants are charged 20% VAT.
  - The course fee does not include accommodation.
  - Tea, coffee and a simple cold lunch are included.
  - There are only 12 onsite seats available.
- Online participants (VAT charge):
  - UK participants are charged 20% VAT.
  - Non-EU participants (including Norway) are not subject to VAT.
  - We do not have to charge VAT to EU-based participants who provide their institutional VAT number.
  - EU-based participants who do not provide a VAT number will be charged VAT at their national rate.

CANCELLATION POLICY:

What if you are not able to participate? Once participants are given access to course exercises with R solution codes, pdf files of certain book chapters, pdf files of powerpoint files and video solution files, all course fees are non-refundable. However, we will offer you the option to attend a future course or you can authorise a colleague to attend this course. Terms and conditions see: http://highstat.com/index.php/sign-up2

COURSE TIMES (UK summer time):

- Monday - Friday: 09.00-16.00
  - Including a 60-minutes lunch break and two short 20 minutes tea/coffee breaks.
- You can use this link for a time zone converter: https://www.timeanddate.com/

FREE 1-HOUR FACE-TO-FACE MEETING

The course fee includes a 1-hour face-to-face meeting with one or both instructors. You can discuss your own data, but we strongly advice that the statistical topics are within the content of the course. The 1-hour consultancy needs to be consumed in one sessions, and will take place at a mutual convenient time. It is not transferable. The meetings needs to take place within 12 months after the last live zoom module.

COURSE LOCATION

Udny Arms Hotel (https://www.udnyarmshotel.com/)
50 Main Street,
Newburgh, Ellon,
Aberdeenshire,
Scotland
AB41 6BL

You can either attend onsite (in person) or/and online via Zoom.

REGISTRATION

www.highstat.com

Dr Alain F Zuur
highstat@highstat.com
www.highstat.com
Payment via credit card or bank transfer