Online live course using Zoom

Generalised Additive Models for the analysis of spatial and spatial-temporal data

Provided by: Highland Statistics Ltd

Course format
- Live online teaching is from 15.00-20.00 UK time (10.00-15.00 EST).
- There are six 5-hour sessions over a 3-week period, representing a total of 30 hours of work.
- The course includes a few theory presentations along with a large number of exercises using real data sets. Detailed, annotated R code will be provided, and a brief period will be set aside for practice before each exercise is discussed in depth.
- Please note that this is not a self-study course.

Brief outline
We will start with a non-technical introduction to generalised additive models (GAM). Using a series of exercises, we show how GAMs can be used to allow for non-linear covariate effects. Once we are familiar with GAM, we will apply them to various spatial, and spatial-temporal data sets.

During the course, GAMs are applied to count data, absence-presence data, proportional data, and continuous data using the Gaussian, Poisson, negative binomial, Bernoulli, beta, gamma and Tweedie distributions.

We will apply GAMs with 2-dimensional smoothers to analyse spatial data, and spatial-temporal data. To allow for natural barriers (e.g. an island in the sea), soap-film smoothers are used.

Throughout the course we will use the `mgcv` package in R. This is a non-technical, and easy-to-follow course.

2 hours face-to-face consultancy
Provided that you attend at least 80% of the Zoom sessions, you will get two hours face-to-face video consultancy with the instructors. You can use this to discuss your own data analysis.

A discussion board (access for 12 months) allows for interaction on course content between instructors and participants.

Online live course

Dates (6 sessions):
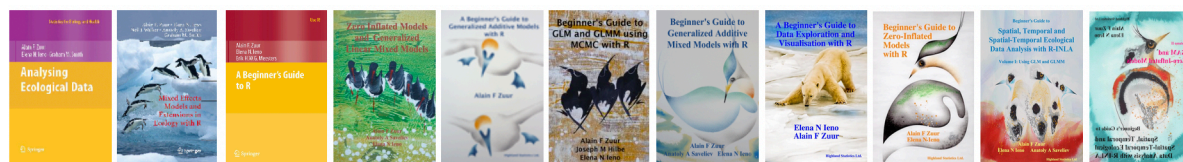- 29 and 30 January, 5, 6, 12 and 13 February 2024.

Price: £450.

Included: **2 hours face-to-face video chat about your data. Conditions apply.**

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

Authors of 12 books and providers of over 250 courses.

Maximum participants: 20

COURSE CONTENT

Preparation material (containing on-demand video):
- Revision exercise on multiple linear regression.
- Introduction to matrix notation.
- Revision of Poisson and negative binomial GLM.
- Introduction to DHARMa.
- What is a variogram.

Modules 1 and 2
- General introduction.
- Theory presentation on GAM.
- Three introductory GAM exercises.
- Key phrases: How to fit a GAM using mgcv, how to read its output, model selection, model validation, smoother interactions, what to present in a paper.

Module 3
- Two revision exercises on Poisson and negative binomial GLM.
- One exercise on negative binomial GAM.
- Two exercises on GAMs applied to spatial data.

Modules 4 and 5
- Catching up.
- Two exercises showing how to use GAM with a spatial smoother in case the study area contains a natural barrier (e.g. an island in the sea).

Module 6
- Four exercises GAM applied to spatial-temporal data using a variety of distributions (e.g. Poisson, negative binomial, Bernoulli, Tweedie, Gamma, beta).
- Time allowing: GAM applied to areal data.

The course material consists of relevant pdf files of presentations, data sets and clearly documented R code.

Course participants will be given access to the course website with all data sets, R solution code and course material 2 weeks before the start of the course.

PRE-REQUIRED KNOWLEDGE:
Working knowledge of R, linear regression, and Poisson, negative binomial and Bernoulli GLM. This is a non-technical course. Revision material (on-demand video) is provided.

GENERAL INFORMATION

COURSE FEE: £450
- Credit card payments are charged in GBP currency.
- VAT charge:
  - Non-EU participants (including Norway) are not subject to UK VAT.
  - UK participants are charged 20% VAT.
  - We do not have to charge VAT to EU participants who provide their institutional VAT number.
  - EU participants who do not provide a VAT number will be charged VAT at their national rate.
  - Canadian participants are subject to GST/HST tax.

COURSE TIMES:
- **All modules:**
  - **15.00-20.00 UK time (10.00-15.00 EST)**
  - Including a 30-minutes lunch break and two short tea/coffee breaks.
- You can use this link for a time zone converter: https://www.timeanddate.com/

	Module 1	Module 2	Module 3	Module 4	Module 5	Module 6
15.00-20.00 (UK time)	29 January	30 January	5 February	6 February	12 February	13 February

FREE 2-HOUR FACE-TO-FACE MEETING

Provided that you attend 80% of the Zoom sessions, the course fee includes a 2-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 2-hours consultancy needs to be consumed in two 1-hour 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. If attendance is between 50-80%, we will offer you 1 hour face-to-face consultancy. If attendance is less than 50%, we will not offer face-to-face consultancy.

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.

GENERAL
- Please ensure that you have system administration rights to install R and R packages on your computer.
- Instructions what to install are on the course website.
- Zoom sessions will not be recorded.
- In order to receive a certificate, you need to attend at least 80% of the zoom live sessions.

REGISTRATION

https://www.highstat.com/

Dr Alain F Zuur
highstat@highstat.com
www.highstat.com