Introduction to GAMs with spatial, and spatial-temporal correlation using R-INLA

Provided by: Highland Statistics Ltd

In cooperation with: Dr. Juan Gallego-Zamorano
De Vlinderstichting, Dutch Butterfly Conservation & Sovon, Dutch Centre for Field Ornithology

We begin with an introduction to Bayesian statistics and how to execute a linear regression model in R-INLA. We then continue by discussing how to include spatial dependency in linear regression and generalized linear models (GLMs). We also provide an introduction to generalized additive models (GAMs) and show how to execute such models in R-INLA. Additionally, we apply GAMs with spatial dependency. Finally, we will show how to execute GLMs and GAMs with spatial-temporal dependency.

During the course, several case studies are presented, integrating statistical theory with applied analyses in a clear and understandable manner. Throughout the course, we will use the R-INLA package in R. This is a non-technical course; provided you have the required knowledge, it is easy to follow.

Pre-required knowledge
Participants should be familiar with data exploration, linear regression and basic GLMs (i.e. Poisson and negative binomial GLM) in R. The course does contain short revisions.

1 hour face-to-face
The course includes a 1-hour face-to-face video chat with the instructors (to be used after the course). You are invited to apply the statistical techniques discussed during the course on your own data and if you encounter any problems, you can ask questions during the 1-hour face-to-face chat.

Onsite course in Wageningen, The Netherlands.

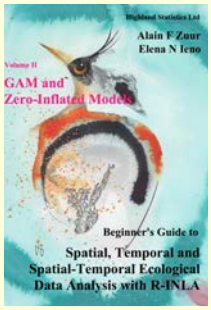
Venue: Hotel de Nieuwe Wereld. Marijkeweg 5
6709 PE Wageningen. The Netherlands.

Dates:
- 22-26 January 2024.

Price: £500.

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

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



A discussion board (access for 6 months) allows for interaction on course content between instructors and participants.

In this course, we will only use the Gaussian, Poisson and negative binomial distributions.

COURSE CONTENT

Monday:
- General Introduction.
- Brief Introduction to Bayesian Analysis. Conjugate priors. Diffuse versus informative priors
- Theory presentation on R-INLA
- Exercise on executing a linear regression model in R-INLA

Tuesday:
- Short theory presentation on adding dependency to a regression model
- Theory presentation on adding spatial correlation to a regression model in R-INLA
- Exercise on adding spatial correlation to a linear regression model

Wednesday
- Exercise on executing a Poisson GLM in R-INLA
- Exercise on adding spatial correlation to a Poisson GLM
- Exercise on adding spatial correlation to a negative binomial GLM

Thursday:
- Theory presentation on GAM in R-INLA
- Exercise on executing a Gaussian GAM in R-INLA
- Exercise on adding spatial correlation to a Gaussian GAM

Friday:
- Catching up
- Theory presentation on adding spatial-temporal correlation in R-INLA
- Exercise on adding spatial-temporal correlation to a negative binomial GAM

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 6 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

GENERAL INFORMATION

COURSE FEE: £500
Credit card payments are charged in GBP currency.
VAT Charge:

- UK participants are charged a 20% VAT.
- Non-EU participants (including Norway and Switzerland) are not subject to VAT.
- We do not 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.

Access to the course website is 6 months.

FREE 1-HOUR FACE-TO-FACE MEETING
The course fee includes a 1-hour face-to-face meeting with one or both instructors. The meeting needs to take place within 6 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.

CANCELLATION POLICY:
Once participants are given access to course exercises with R solution codes, pdf files of certain book chapters, and pdf files of presentations, all course fees are non-refundable. Terms and conditions see: http://highstat.com/index.php/sign-up2

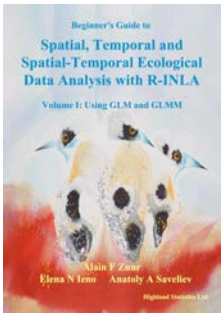
GENERAL

- 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.

PRE-REQUIRED KNOWLEDGE
Good knowledge of R, data exploration, linear regression and GLM (Poisson and negative binomial). Short revisions are provided. This is a non-technical course.

RECOMMEND LITERATURE:

- Zuur, Ieno, Saveliev (2017). Beginner's Guide to Spatial, Temporal and Spatial-Temporal Ecological Data Analysis with R-INLA.
- Zuur and Ieno (2018). Beginner's Guide to Spatial, Temporal and Spatial-Temporal Ecological Data Analysis with R-INLA. Volume II: GAM and Zero-Inflated Models (2018).
- These books are available from www.highstat.com.
- Books are not included in the course fee. The course can be followed without purchasing these books.



REGISTRATION

http://highstat.com/index.php/courses
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