

Online course with on-demand video and live Zoom meetings

Introduction to Regression Models with Spatial Correlation using R-INLA

Provided by: Highland Statistics Ltd

This online course consists of 7 modules representing a total of approximately 40 hours of work. Each module consists of video files with short theory presentations, followed by exercises using real data sets, and video files discussing the solutions. All video files are on-demand and can be watched online, as often as you want, at any time of the day, within a 6 month period.

A discussion board allows for daily interaction between instructors and participants. The course also contains 4 live web meetings in which we answer any questions and also discuss some of the exercises.

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 on the Discussion Board.

Date

Date: 5 April - 26 April 2021

Price: £500 + **1 hour free face-to-face video chat about your data**

Multiple live online meetings in different time zones.

Instructors: Dr. Alain Zuur
Dr. Elena Ieno

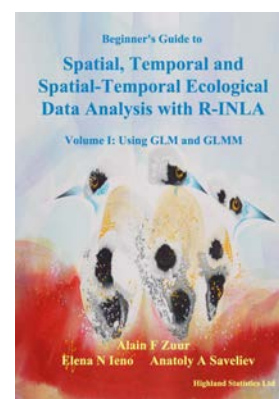
Authors of 11 books and providers of over 150 courses

Course content

We begin with an introduction how to add dependency to regression models using frequentist tools. After discussing the limitations of this approach we switch to Bayesian techniques. R-INLA is used to implement regression models, generalised linear models (GLM) and generalised linear mixed models (GLMM) with spatial dependency.

We will also explain how to deal with dependency around islands and fjords (barrier models). We will use geostatistical data and areal data.

During the course several case studies are presented, in which the statistical theory is integrated with applied analyses in a clear and understandable manner.



COURSE CONTENT

Module 1 consists of 5 on-demand videos

- General introduction.
- Theory presentation on adding dependency to a regression model using frequentist techniques: Temporal correlation, spatial correlation and mixed-effects models.
- One exercise.
- Short introduction to mixed effects models.
- One exercise on linear mixed effects models.

Module 2 consists of 5 on-demand videos

- Brief introduction to Bayesian analysis.
- Conjugate priors.
- Diffuse versus informative priors.
- Theory presentation on INLA.
- Exercise showing how to execute a linear regression model in R-INLA.
- **Live Zoom session 1 covering Modules 1 and 2.**

Module 3 consists of 4 on-demand videos

- Exercise showing how to execute a linear mixed-effects model in R-INLA.
- Exercise showing how to execute a Poisson GLM in R-INLA.
- Exercise showing how to execute a negative binomial GLM in R-INLA.
- Exercise showing how to execute a Bernoulli GLM in R-INLA.
- **Live Zoom session 2 covering Module 3.**

Module 4 consists of 3 on-demand video files

- Theory presentation on adding spatial correlation to regression models in R-INLA.
- Exercise showing how to add spatial correlation to a linear regression model.
- Exercise showing how to add spatial correlation to a Poisson GLM.

Module 5 consists of 4 on-demand video files

- Exercise showing how to add spatial correlation to a negative binomial GLM.
- Exercise showing how to add spatial correlation to a Bernoulli GLM.
- Exercise showing how to add spatial correlation to a gamma GLM.
- Exercise showing how to add spatial correlation to a beta GLM.
- **Live Zoom session 3 covering Modules 4 & 5.**

Module 6 consists of 3 on-demand video files

- Theory presentation on barrier models for dealing with islands and fjords.
- Two exercises showing how to implement the barrier model.

Module 7 consists of 3 on-demand video files

- Theory presentation on the analysis of lattice and areal data.
- Exercise showing how to use the CAR correlation with a Poisson GLM.
- **Live Zoom session covering Modules 6 and 7.**

A roadmap of essential exercises and theory presentations will be provided.

GENERAL INFORMATION

COURSE FEE: 500 GBP

- Credit card payments are charged in GBP currency.
- UK participants are subject to 20% VAT. EU participants (but non-UK) are not subject to UK VAT, but need to provide their institutional VAT number. Non-EU participants are not subject to VAT.

LIVE ZOOM MEETINGS DISCUSSING SOME OF THE EXERCISES

Video files of every theory presentation and all exercises are available to view. Zoom summary sessions from a previous course (summarising most of the material) are also available to view.

In this course we assume that you go through the course material in your own time. Four live Zoom sessions will be scheduled. During these sessions you can ask any questions, and we will also discuss some of the exercises. If requested, short ad-hoc live question-and-answer sessions via Zoom can be scheduled.

	Module 1	Module 2	Module 3	Module 4
09.00-11.00 BST	5 April	8 April	19 April	26 April
19.00-21.00 BST	5 April	8 April	19 April	26 April

BST = British Summer time

- 09.00 London (BST) = 10.00 Amsterdam / 16.00 Perth (Australia) / 18.00 Brisbane (Australia).
- 19.00 London (BST) = 14.00 New York (US) / 12.00 Edmonton (Canada).
- Please use this link for a time zone converter: <https://www.timeanddate.com/>

The duration of the Zoom sessions is around 2 hours. Course participants will be given access to the course website with all the videos, data sets, R solution code and course material when they sign up. You can start this course anytime.

FREE 1-HOUR FACE-TO-FACE MEETING

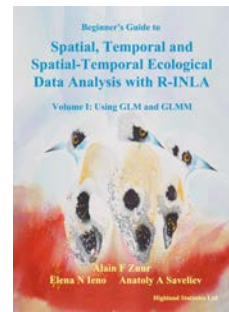
The course includes a 1-hour face-to-face meeting with one or both instructors. The meeting needs to take place within 3 months after the last live zoom meeting. You can discuss your own data, but we strongly recommend that the statistical topics are within the content of the course. The 1-hour needs to be consumed in one session. It will take place at a mutual convenient time.

PRE-REQUIRED KNOWLEDGE:

Good knowledge of R, data exploration, linear regression and GLM (Poisson, negative binomial, Bernoulli). Working knowledge of mixed-effects models. 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*.
- This book is available from www.highstat.com.
- Books are not included in the course fee. The course can be followed without purchasing these books.



GENERAL

- Please ensure that you have system administration rights to install R and R packages on your computer.
- Instructions what to install will be provided before the start of the course.

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/courses>

REGISTRATION

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