

Online workshop: GLM with spatial, temporal and spatial-temporal correlation using R-INLA

Provided by: **Highland Statistics Ltd**

This course consists of two comprehensive parts. In Part 1, we focus on teaching the application of GLMs with spatial, temporal, and spatio-temporal correlation using R-INLA. Part 2 is designed to give participants the opportunity to work hands-on with their own data and receive detailed feedback.

Part 1: Core Learning and Practical Application: This part introduces how to incorporate temporal, spatial, and spatio-temporal dependencies into GLMs using Bayesian techniques with R-INLA. You will learn to apply these methods in Gaussian, Poisson, and negative binomial GLMs.

To extend your learning, the course website includes on-demand videos demonstrating the use of additional distributions, such as Bernoulli, beta, Tweedie, and Gamma. These videos provide worked examples for analysing absence/presence data, proportional data, and continuous data, which you can explore at your own pace.

Part 2: Personalised Data Analysis and Feedback. Part 2 offers a truly hands-on experience. After Part 1 concludes, you will have six days to work independently, applying the techniques to your own data sets. During this time, you will have continuous support via a discussion board, chat, or email, ensuring you can address any challenges or questions as they arise.

During Part 2, each participant will have 1 – 1 1/2 hours to present their analysis, during which the instructors and fellow participants will offer detailed feedback and suggestions. This isn't just a presentation session—it's a collaborative experience where we dive deep into your results, discuss alternative approaches, and explore how to refine your analysis. This helps you move beyond theory and into the practical application, allowing you to strengthen your statistical understanding in a meaningful, project-based way.

We also include a Q&A and troubleshooting session, where we tackle common issues that arise during data analysis and provide expert advice on overcoming these obstacles.

Dates (2025):

- Part 1: 6 - 9 January
- Part 2: 16, 17 January
- Catching up: 17 April
- 09.00 - 16.00 (UK time)

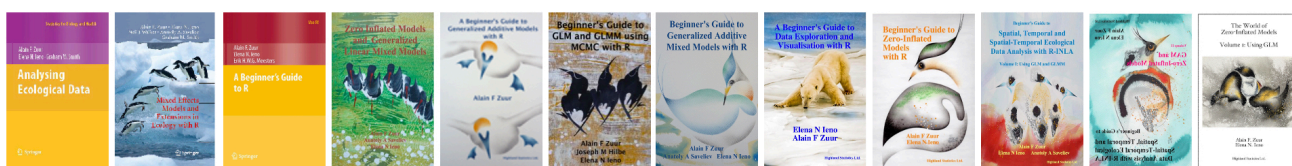
Maximum number of participants: 8

Price: 625 GBP

Instructors:

- Dr. Alain Zuur
- Dr. Elena Ieno

Authors of 12 books and providers of over 250 courses



COURSE CONTENT

Part 1, module (Monday 6 January 2025)

- General introduction.
- Theory presentation on adding temporal and spatial dependency to a regression model using frequentist techniques.
- One exercise showing how to add spatial dependency to a regression model using frequentist tools.
- Brief introduction to Bayesian analysis.
- Conjugate priors: Diffuse versus informative priors.

Part 1, module 2 (Tuesday 7 January 2025)

- Theory presentation on INLA.
- Exercise showing how to execute a linear regression model in R-INLA.
- Theory presentation on adding spatial correlation to a regression model in R-INLA.

Part 1, module 3 (Wednesday 8 January 2025)

- Exercise showing how to add spatial correlation to a linear regression model.
- Exercise showing how to execute a Poisson GLM in R-INLA.
- Exercise showing how to add spatial correlation to a Poisson GLM.

Part 1, module 4 (Thursday 9 January 2025)

- Exercise showing how to add spatial correlation to a negative binomial GLM.
- Exercise showing how to add temporal correlation to a GLM.
- Exercise showing how to add spatio-temporal correlation to a Poisson or negative binomial GLM.

Format of Part 2: Thursday 16 and Friday 17 January 2025

- In Part 2, participants will have the opportunity to present their own analyses and receive personalised feedback. Each participant will have a 45-minute presentation slot (voluntary), followed by a 45 minute feedback and group discussion session.
- **Peer Feedback Sessions:** Along with feedback from the instructors, participants will engage in a peer-review process. After each presentation, other participants will offer constructive feedback on methods, interpretation of results, and visualisation techniques. This creates a collaborative and interactive learning environment, allowing you to learn from different approaches and perspectives.
- **Group Discussion on Common Themes:** We will also have group discussions focused on common challenges and themes that emerge during the presentations. This allows participants to share insights, discuss solutions, and learn from each other's experiences.
- **Follow-up Exercises:** Participants will have the opportunity to complete follow-up exercises after receiving feedback. These exercises will allow you to refine your models and apply the insights gained from the group discussions and feedback sessions. Further support will be available through the discussion board, giving you time to fully absorb the material.

Catching up session (17 April 2025):

- Three months after the course, we will hold a Catching Up Session to help you continue progressing with your data analysis. This session will include a dedicated Q&A, where you can revisit the course materials, ask questions, and seek further guidance from the instructors.

For Part 2 and the Catching Up session: Please note that while the session duration may be shortened if fewer participants choose to present or ask questions, it may also extend slightly if additional time is needed to accommodate all presentations and discussions. No pro-rata refund will be provided if the session is shortened. Discussions and feedback will be limited to the techniques and methods covered during the course.

Certification: Upon completion of the course, you will receive a certificate of participation, detailing the skills you have acquired.

GENERAL INFORMATION

PRE-REQUISITE KNOWLEDGE::

A working knowledge of R, data exploration, linear regression, and Poisson and negative binomial GLMs is required. This is a non-technical course.

The course website provides preparatory materials, including on-demand videos and R scripts covering multiple linear regression, basic matrix notation, generalised linear models, model validation using DHARMA, and an explanation of variograms. If you are not familiar with these methods, please review the materials before the course begins.

GENERAL INFORMATION

- Please ensure you have administrative rights on your computer to install R and R packages. Installation instructions are available on the course website.
- Access to the course website is available for 12 months.
- We reserve the right to modify the exercises.
- All exercises include data sets, annotated R scripts, and on-demand videos.
- All theory presentations consist of on-demand video and pdf files.

COURSE TIMES (UK time):

- 09.00-16.00, including a 60-minutes lunch break and two short 20 minutes tea/coffee breaks.
- The Part 2 modules and the Catching-Up session may be shortened or extended slightly depending on the number of presentations and discussions, as well as the time needed to accommodate all participants.

REGISTRATION

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Payment via credit card or bank transfer

