Online course with on-demand video and live Zoom meetings

Introduction to R using a protocol for conducting and presenting results of regression-type analyses

Provided by: Highland Statistics Ltd

In this course we will provide an introduction to R. We will do this in the context of a 10-step protocol based on Zuur and Ieno (2016).

The protocol takes us from organisation of data (formulating relevant questions, visualising data collection, data exploration, identifying dependency), through conducting analysis (presenting, fitting and validating the model) and presenting output (numerically and visually), to extending the model via simulation. We will also cover power analysis (which can be used to determine sample size).

FOR WHO IS THIS COURSE

This course is for scientists who would like to learn R in a non-traditional approach by applying it in a playful way, and also for scientists who have been exposed to an introductory R course and would like to extend their skills to the next level. This course is also beneficial if you would like to learn data exploration and visualisation.

FORMAT OF THE COURSE

This online course contains various modules representing a total of approximately 8 to 10 hours of work. Each module consists of multiple 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 a series of (approximately) 2-hour live Zoom web meetings in which we summarise the exercises, and answer questions. Attending these live web meetings is optional.

The course contains a 1-hour face-to-face video chat in which you can discuss your own data.
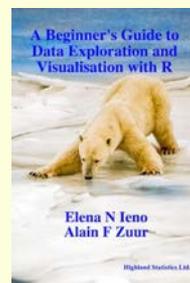

Date and Price

Dates:
   17, 24 and 31 May 2021
   6 months access

Price: 100 GBP

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

Instructors: Dr. Alain Zuur
             Dr. Elena Ieno
Authors of 11 books and providers of over 250 courses

COURSE CONTENT

Module 1: Introduction to R, theory presentation (10-step protocol) and executing steps 1 and 2 of the protocol in R

We will discuss the installation of R, R-Studio and add-on packages, importing data into R, merging data, taking subsets and accessing variables.

We will present a 10-step protocol for conducting and presenting results of regression-type analyses. We will also discuss data exploration tools.

We will present various data sets and discuss how to formulate the underlying questions (which will motivate the application of certain statistical techniques). We will use the ggplot package in R to visualise spatial-temporal data, and explain how to modify and manipulation data sets in R (e.g. removing rows or columns, creating new variables, etc.).

Protocol for conducting and presenting results of regression-type analyses

1. State appropriate questions
2. Visualize the experimental design
3. Conduct data exploration
4. Identify the dependency structure in the data
5. Present the statistical model
6. Fit the model
7. Validate the model
8. Interpret and present the numerical output of the model
9. Create a visual representation of the model
10. Simulate from the model

Fig. 1. Protocol for statistical analysis of data and presenting results in a scientific paper.

Web meeting 1: A 2-hour web-meeting will be scheduled.

Module 2: Conduct data exploration in R and visualise the dependency structure in the data (steps 3 and 4 of the protocol).

We continuation with the visualisation of spatial data, time series data and spatial-temporal data. Data exploration (Zuur et al. 2010) is applied on various data sets using R functions like the plot, boxplot and dotchart functions. However, the emphasis is on the ggplot2 package to make multipanel graphs.

Web meeting 2: A 2-hour web-meeting will be scheduled.

Module 3: Steps 5 - 10 of the protocol.

In this module we assume that you are familiar with bivariate linear regression. We will show how to implement such a model in R, explain how to assess the underlying assumptions, and visualise the model. Note that we will not explain the underlying theory. We will also explain what to present in a paper or report.

During the exercises we will explain statistical topics like the PCA biplot and also power analysis (which can be used to determine how many samples to take) in Layman's terms.

Web meeting 3: A 2-hour web-meeting will be scheduled.

For a more detailed course outline, see the course website.

<div align="center">**GENERAL INFORMATION**</div>

COURSE FEE: 100 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 UK VAT.

LIVE 2-HOUR ZOOM MEETINGS SUMMARISING THE MODULES

	Zoom meeting 1	Zoom meeting 2	Zoom meeting 3
19.00 - 21.00 BST	17 May 2021	24 May 2021	31 May 2021

If you are interested in a 09.00-11.00 BST Zoom session, please let us know. If there is enough interest (> 5 people), then we will organise it on the same dates. Zoom sessions from a previous course are available to view.

BST = British Summer Time
- 19.00 London (BST) = 14.00 New York / Montreal = 16.00 Sao Paulo.
- For a world time converter, see https://www.timeanddate.com/

Course participants will be given access to the course website with all the videos, data sets, R solution code and course material as soon as they sign up. Access is 6 months. Video files cannot be downloaded, but they can be watched in the same way as on Netflix.

COURSE MATERIAL:
- Pdf files of all presentations are provided. These files are based on Zuur and Ieno (2016), Ieno and Zuur (2015) and Zuur, Ieno and Elphick (2010).
- All R solution files and data sets are provided before the start of the course.

PRE-REQUIRED KNOWLEDGE:
A working knowledge of bivariate linear regression is recommended. A short revision is provided. This is a non-technical 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

RECOMMEND LITERATURE:
- Zuur AF, Ieno EN (2016). A protocol for conducting and presenting results of regression-type analyses. *Methods in Ecology and Evolution* **7**: *636–664*.
- Ieno EN, Zuur AF (2015). *Beginner's Guide to Data Exploration and Visualisation with R*. Newburgh, UK: Highland Statistics. This book is exclusively available from www.highstat.com

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.
- Upon completion of the course you will get a certificate (pdf file).
- The course represents about 10 hours of work.

REGISTRATION

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