2021 Advanced Statistics Workshop, XTBG

Call for application

Venue: Xishuangbanna Tropical Botanical Garden (XTBG), Chinese Academy of Sciences

Dates: workshop will be held 14 – 19 June 2021

Registration deadline: application will be closed at 6 June 2020

Organiser: Xishuangbanna Tropical Botanical Garden, Chinese Academy of Sciences

Sponsors: Environmental Education Centre of the Xishuangbanna Tropical Botanical Garden, CAS

Registration fee: 1000 RMB/person (including lecture room, materials, allowance for instructor and other staffs; **not including** transportation between your organization and XTBG, hotel and food during the workshop etc.)

About the workshop: This advanced workshop aims at introducing students to linear modelling methods that are commonly used in Ecology today. The workshop consists of a series of modules that build on each other towards more complex linear models, starting from simple linear models, through generalised linear models, to mixed effects models and ending with linear models with generalised least squares and phylogenetically correlated data. We expect participants should be competent at using these methods after the workshop and understanding when they are appropriate to use.

Requirements for applicants: (1) Participants should have seen at least one semester of statistics at university or college. Students who have completed the AFEC stats module will also be considered. (2) Participants should be familiar with R. Students familiar with S and SAS may also apply. Please provide evidence in line with each of these requirements when applying for the course. (3) The course is divided into a series of modules that build on each other towards more complex linear models, starting from simple linear models and generalised linear models, to mixed effects models with grouped random effects, and linear models with generalised least squares for random effects that cannot be grouped. The underlying linear models are explained so experience with linear algebra will be very helpful though not essential to complete the course.

Workshop outline:

Module 1: Classical methods (~ 1 day)
The first day revises basic statistical concepts and classical methods, and links them via the linear model and the generalised linear model.

Module 2: Modelling with grouped non-independent data: mixed effects models for grouped random factors (~ 2.5 days)
This section introduces the problem of non-independent data and how to fix it appropriately using linear models. Here we introduce concepts of fixed and random effects and how they can be combined in mixed effect model (MM) formulations of the general linear model. At this stage we deal only with grouping random effects.

Module 3: Modelling with non-independent data that cannot be grouped: covariance matrix methods (~2 days)

Certain types of data are non-independent, but the non-independence cannot be corrected by grouping, e.g. autocorrelation in spatial and temporal data, which depend on individual pairwise distances between data units. These can be dealt with by incorporating covariance matrices into the calculations. In this module we introduce two methods for dealing with this: generalised least squares (GLS) and an extended MM called the animal model. Because of limits on available software in R for the animal model, we will use Bayesian formulations and software. Therefore, we will also include a brief intro to Bayesian philosophy and considerations for Bayesian analyses here.

Student number: not more than 30 (20 offline + 10 online)

Instructor: (1) Professor Kyle Tomlinson, PI of Community Ecology and Conservation Group of XTBG, working on landscape conservation, forest ecology, savanna ecology, and functional trait diversity. Kyle is a very good and experienced statistic instructor and has been invited to run statistic workshops during ATBC-Asia chapter annual meetings since 2014, and during Advanced Fieldcourse in Ecology and Conservaton (XTBG's annual international training program) since 2013. Since 2020 he has been the associate editor of Journal of Ecology. (2) Dr. FAN Huan, Post doctor in Community Ecology and Conservation Group of XTBG, working on bioinformatics, next-generation sequencing, host-associated microbiome. Huan is experienced with data analysis and teaching, since last year she started to teach the Bayesian part for this workshop.

Please go to https://www.wjx.top/jq/34227526.aspx **to register**

If you have any questions about the workshop, please email liujx@xtbg.org.cn, and/or kyle.tomlinson@xtbg.org.cn