CoDaCourse-2014 at University of Girona, Spain: 2014 July 7-11

IASC-ERS Summer School on Compositonal Data Analysis (CoDA)

The **IASC-ERS summer school on compositional data analysis**, imparted at the premises of the University of Girona (UdG), is supported by the European Regional Section of the International Association for Statistical Computing.

The *IASC-ERS summer school on CoDA* provides an introduction to the theoretical and practical aspects of statistical analysis of compositional data, as well as an informal discussion forum on more advanced modeling topics.

Compositions are vectors which components show the relative importance of some parts (in percentages, ppm, ppb, or the like) of a whole. Typical examples are: economy (income/expenditure distribution), medicine (body composition: fat, bone, muscle), food industry (food composition: fat, sugar, …), geochemistry and chemometrics (chemical composition), ecology (abundance different species), sociology (time-use surveys), and genetics (genotype frequency). John Aitchison introduced the log-ratio approach to do CoDA back in the eighties. Since then, progress has been done in understanding the geometry peculiar to their sample space, the D-part simplex. This course will present the current state of the art in this field of active research and will cover the following topics:

1. Hypothesis underlying CoDA (sample space, scale).
2. The Aitchison geometry of the simplex.
3. Coordinate representation of compositions; distributions on the simplex.
4. Exploratory analysis (centering, variation array, biplot, balances-dendrogram).
5. Compositional linear processes in the simplex; regression.
6. Irregular data in CoDA: missing data, zero values, and outliers.
7. Introduction to multivariate CoDA: cluster and discriminant analysis.
8. Introduction to available software: CoDaPack and R-packages.
9. Open seminar: discussion sessions.

The summer school will consist of lectures, exercises and an open seminar. Exercises are done with the freeware CoDaPack (http://ima.udg.edu/codapack/) and the package "GUIcompositions" from the open source statistical environment R. The open seminar is a case-based discussion. Some datasets and their particular problems will be presented. They will be discussed and analysed interactively. Assistants are encouraged to bring their own data sets and state those questions they would like to be answered during the course. Some of these proposals will be selected for a detailed open discussion.

Statisticians and applied scientists of any field, in particular engineering geologists, geologists, economics, scientists, environmental engineers, and bio&environmental scientists, working in academic or industrial institutions, are strongly encouraged to take the course. It is recommended that attendants have undergone some first semester courses on statistics, algebra and calculus. Basic knowledge about multivariate statistics may also be handy.

The *summer school on CoDA* is organized by the Research Group on Statistical MEthods in resTRICted spaceS, whose acronym is METRICS. The core of the group belongs to the Computer Science, Applied Mathematics and Statistics Department of the University of Girona (UdG), and includes members from the Technical University of Catalonia (UPC), and the Biomathematics & Statistics Scotland (BIOSS).

DESCRIPTION

Staff

First Name	Last Name	Affiliation	Web page
Dr. Juan José	Egozcue-Rubí	UPC (Spain)	http://eprints.upc.edu/producciocientifica/invest/178708
Dr. Vera	Pawlowsky-Glahn	UdG (Spain)	http://ima.udg.edu/~verap/
Dr. Carles	Barceló-Vidal	UdG (Spain)	http://ima.udg.edu/~barcelo/
Dr. Josep Antoni	Martín-Fernández	UdG (Spain)	http://ima.udg.edu/~jamf/

How to apply: Register on the website: www.compositionaldata.com and fill in the form from the CoDaCourses menu. **Due to the class room facilities at the UdG, the places are limited to 30.**

Duration: 2014 July 7-11; 5 days from 9:00-17:00, including coffee-breaks and lunches (i.e. 30 class room hrs).

Language: English

Support, certificate and acreditation: IASC supports the course. Attendance certificate will be provided, officially accredited by the International Association for Mathematical Geosciences (IAMG: http://www.iamg.org/).

Fees and location:

- Students: without accommodation: € 150; with accommodation € 275.
- Regular: without accommodation: € 250; with accommodation € 375.

Students can apply for a reduced fee, by sending to the organization of the CoDaCourse a proof of their condition (scanned membership card, university documentation, etc.). IASC and ISI members receive an additional discount of 10%.
The fee includes all course material, coffee breaks, lunches and dinner on Thursday.
The fee with accommodation also includes a room (5 nights; Sunday to Friday) in a student residency (http://www.resa.es/eng/Residences/Campus-de-Montilivi). It will be a basic room (bed and bathroom) with shared kitchen and living room. Sheets and towels will be provided at the residence. Breakfast is not included.
The residence is in the Campus of Montilivi of the UdG, near the class room "Sala Actes", ground floor of the building P-4 (Politècnica 4) [http://goo.gl/maps/Q5oa; Coord: 41°57′46.97″N 2°49′54.69″E]. It is well communicated with the city centre by bus (lines 1 and 2), a mere 5 minutes.

Girona and its surrondings: the city offers an endless list of amenities; cultural, gastronomy, sports and leisure, and educational. We can assure you a pleasant stay because Girona is considered one of the most comfortable cities in Spain. Its traditions together with its high development rate make the city a reference in all aspects. For further information visit http://www.girona.cat/turisme/eng/. Its surrondings includes the famous touristics places: Costa Brava, Figueres-Dalí Museum and Barcelona.