PRBB Intervals Course Proposal

Course Title
Introduction to Scientific Data Visualization

Proposed date(s)
19th & 26th October

Course Language
English

Course Leader(s) and very brief summary of relevant qualifications and experience (no more than 2 lines for each trainer)
Fernando Cucchietti.
Head of visualization and data analytics at the BSC; PhD in quantum physics at the University of Córdoba, Argentina; with postdocs at Los Alamos National Laboratory and the Institute of Photonic Sciences.
Guillermo Marin.
Lead visualization artist at the BSC and Director of UPF's Masters in Computer Animation; BFA at the UB; MSc in Cognitive Systems and Interactive Media at UPF; +10 year experience in the animation industry.

Rationale for course (why is this course of interest for the PRBB staff?)
Communication is a key aspect of science, either as dissemination or between peers. Although often neglected by scientists, the visual aspect of the communication plays a crucial role in its effectiveness--in particular if data are used as supporting evidence for the message. The field of Data Visualization provides us with a set of tools, techniques, and strategies to display data in ways that are both appealing and informative; that capture the attention of the audience while still being accurate and rich in information.

This course provides scientists with the basic understanding of data visualization principles to communicate their results through impactful and accurate charts and graphs. The principles of graphic design and information visualization that form the course are useful to show results in conferences, articles, or to build exploratory visualizations to interrogate the data.

The contents of the course come from the field of data visualization and are independent of any particular research area. Thus, they can be applied in a variety of fields as long as they involve data, and the need to visually communicate complex information.

Course aim - general
To learn how to present scientific data and maximize the effectiveness of your visualizations

Specific learning outcomes (what new skills, knowledge &/or attitudes will participants to take away from the course?)
- Being able to extract and process data and information to work with it in visualization settings
- Transform the analyses and conclusions into narratives of visual/auditive character
- Knowing and understanding current technologies for data visualization

Course contents (outline of topics to be covered)

    a) Data and information visualization

        Data: Extraction, treatment, formats, and analysis

        Visual encoding strategies: Tables, charts, maps, and graphics

        Visual perception and usability in data visualization

        Art vs Communication, complexity vs simplicity

        Software and tools

    b) Storytelling with data

        Visual honesty and precision

        Interacting with data

        Tangibilization of information

        Data narrative techniques

Training methods

Theoretical lectures and workshop-style practical exercise. Attendants will develop a short visualization project to apply what they have seen in class in a learn-by-doing style. Feedback will be sent via e-mail following the course.

Target group in PRBB (Senior scientists, postdocs, predocs, management/admin staff, all residents)

Students, post-docs and senior researchers interested in the visual display of information

Number of participants (maximum)

15

Total course hours (Please specify: a) direct training with instructor present b) required self-study.

Note: only the direct training hours will be included in the post-course certificate.

8 hours of direct training. 6 hours of required self-study

Distribution of course (hours/days)

2 days, 4 hours each day

Pre-course preparation and/or between sessions?

No pre-course preparation required.

Self-study for final exercise (visualization software tutorials, and recommended readings)

Material participants need to bring (laptops, etc…)

Laptops

Relevant background reading/ audiovisual/websites or other materials

- Trainer's documentaries using dataviz: https://goo.gl/Q5oDZZ
- Books: The functional art (Alberto Cairo), Visualization Analysis and Design (Tamara Munzner)
- Interesting material on color: http://www.visualisingdata.com/, http://flowingdata.com/, https://goo.gl/ql1WmI