Abstract

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The main goal of the course is to prepare participants for eye-tracking data analyses, teach them how to describe eye-tracking results, and make publication ready visualisations for a scientific journal or a conference, e.g., ACM Computer-Human Interaction. All analyses we be done in a widely used in scientific community R language. Students will be accustomed with R environment, they will learn how to write a basic analytical code and use the built-in and online help. There is no requirement of prior experience in coding to participate in the course. All analyses and exercises will be conducted on an example of visual search experiment built in PsychoPy during the Winter School.

Participants during the course will plan statistical analyses of eye tracking experiments according to the research design and hypotheses. The lectures will provide participants with theoretical requirements of statistical tests, e.g. level of measurement or number of participants and data points. The first part of hands on sessions will be dedicated to data set preparation for different analytical procedures. We will test the theoretical requirements and learn how to search for and deal with outliers. This relatively boring part is extremely important in the proper data analyses since we don't want to be victims of a popular statistical saying ''garbage in = garbage out''.

The second part of the course will focus on an initial investigation of data sets which allows the researcher to check descriptive statistics and exploratory visualisation of eye tracking data. We will talk about requirements and differences between analytical and publication-ready data and results visualisations.

In the third part of the course participants will get the knowledge and skills of basic statistical testing of hypotheses concerning one and more fixed factors. The focus will be put on interaction effects analyses using analysis of variance (ANOVA) and Linear Mixed Models (LMM) which allow- to test a moderating role of fixed factors. Specifically, students will be familiarized with terms such as simple main effects and simple effects (pairwise comparisons). Concerning the later ones we will give a lecture about different types and pairwise comparisons corrections (e.g., Bonferroni) their theory and typical usage. Students during this part of the course will also learn how to describe the results of the analyses according to APA standards, which is one of the mostly widely used scheme in the scientific articles.

Finally, during the hands on session participants in small groups will write brief reports from a demo study they will conduct during the course. Each report will be focused on different hypothesis stated prior to data collection. All reports will be prepared in the text form which will be a simulation of a part of a scientific article as well in the form of a presentation ready for a scientific conference.