Eye tracking methodology for psychological science (3 hp)

Eye tracking is used in many areas of psychology and neuroscience as a means of studying attention and other cognitive processes. The technology is non-invasive and can be used for research in groups across the whole developmental span from infancy to old age. Eye tracking studies have also shed light on clinical conditions such as autism. While eye tracking data can be relatively easy to record, the analysis involves several analytical steps which are important to understand. This course will give an introduction to eye tracking as a tool in psychological research.

Course leader

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Language

English

Intended learning outcomes

At the end of the course, the doctoral student will be able to:

1) Understand the principles underlying eye tracking and pupillometry
2) Understand and apply key concepts of eye tracking analyses, including fixation filters
3) Understand how eye tracking and pupillometry can be used to address psychological research questions
4) Conduct a basic eye tracking analysis in R (or a similar language)

Prior knowledge

Practical exercises in R form part of the course. Students who are not familiar with R are advised to familiarize themselves with the software and particularly with the *dplyr* package. No prior knowledge is needed to follow the lectures and seminars.

Teaching and learning activities

- *Lectures and seminars* which cover essential aspects of eye tracking data acquisition and analyses.
- *Practical workshops* in which students will practice eye tracking analyses and visualization.

Compulsory elements

- *Participation in seminars and workshops*

Examination

The examination consists of a research plan for a planned eye tracking study *or* an essay on a methodological question in the eye tracking field, either of which will be presented in written form (2-3 pages) and orally during an examination seminar. The report should discuss questions related to analysis and data acquisition. To course will be graded Pass or Fail. To pass the course, the student needs a Pass on both the written and oral part of the examination.

Course Period

Course period C-D (April-May 2025)

Course Literature

Carter, B. T., & Luke, S. G. (2020). Best practices in eye tracking research. *International Journal of Psychophysiology*, *155*, 49-62.

Duchowski, A.T. (2017). *Eye tracking methodology. Theory and practice*, 3d. Ed., Springer: Heidelberg/Berlin *(Note:* ***Selected parts only. This book is available online for free****)*

Hessels, R. S., & Hooge, I. T. (2019). Eye tracking in developmental cognitive neuroscience–The good, the bad and the ugly. *Developmental cognitive neuroscience*, *40*, 100710.

Mathôt, S. (2018). Pupillometry: Psychology, physiology, and function. *Journal of Cognition*, *1*(1).

Other relevant articles will be provided during the course.