LITHUANIAN UNIVERSITY OF HEALTH SCIENCES

International Summer School Practice

Which one is bigger? Eye movements and size illusions

Judging which of two objects is larger is one of the most basic visual decisions, yet perceived size is strongly shaped by context, as size-contrast illusions such as the Ebbinghaus figure show. Where we look while comparing objects may contribute to these biases, but the link between gaze behaviour and size judgements remains poorly understood.

In this traineeship, one or two students will design, run and analyse a size-comparison experiment with simultaneous eye-tracking. Observers will judge which of two discs is larger, both in isolation and embedded in an illusion-inducing context. Adaptive psychophysical procedures will be used to estimate discrimination thresholds (JND) and points of subjective equality (PSE), while eye movements are recorded throughout.

The study follows a small-N design: a small number of observers (3–5) each complete several sessions and thousands of trials, and effects are estimated and replicated at the level of individual observers. This approach, standard in psychophysics, yields precise individual estimates and is well suited to a one-month project.

The project has two complementary analysis strands. The psychophysical strand covers fitting psychometric functions, quantifying illusion magnitude and estimating uncertainty. The eye-movement strand covers detecting fixations and saccades, defining areas of interest and relating gaze allocation to perceptual choices. With two trainees, each leads one strand; a single trainee completes both, with a simplified eye-movement analysis.

Trainees will gain hands-on experience in experiment programming, eye-tracker calibration and data quality control, ethical work with research participants, data analysis in Python or R, and presenting scientific results. Expected outputs are a documented experiment, an annotated dataset, analysis scripts, a short written report from each trainee and an oral presentation at the department seminar.