



Workshop on Eye Tracking and Pupillometry

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08th to the 10th of June 2026

Days 1 – 2: 9:00–18:00

Day 3: 9:00–13:30

Participant Requirements Own laptop with a recent, active MATLAB installation

Learning Outcomes

- I. Interpret eye movements / pupil size as cognitive signals
- II. Preprocess eye-tracking / pupillometry data in MATLAB
- III. Apply state-of-the-art deconvolution methods
- IV. Critically evaluate pupil-based cognitive effects

Outline

Day 1 – Foundations of Eye Tracking

Morning: Lectures

- Types of eye movements (blinks, fixations, saccades, pupil dilation and constriction, hippus, microsaccades, opto-kinetic nystagmus)
- Neural and clinical basis of eye movements
- Eye-tracking technologies: historical and modern approaches
- From raw signals to analysis pipelines (*MATLAB*, *FieldTrip*)

Afternoon: Practical

- Live demonstration of an EyeLink system: (setup, calibration, operation)
- Inspection of pre-recorded eye-tracking data during free viewing
- Visualization of gaze and pupil signals
- Identifying eye movements, blinks, and artifacts



Day 2 – Eye Movements & Pupillometry

Morning:	Pupil size as a marker of arousal and cognition
Lectures	Separating the pupil light reflex from cognitive pupil responses
	Experimental design in <i>PsychoPy</i> : best practices for pupillometry
	Why pupil responses overlap in time
Afternoon:	Preprocessing of eye-movement data (blink handling, epoching)
Practical	Gaze position analysis and fixation density maps
	Event coding for advanced analysis

Day 3 – Pupillometry & Deconvolution

Morning:	Preprocessing pupil data (interpolation, filtering, downsampling)
Practical	Quantifying pupil dilation time courses
	Statistical analysis of pupil responses
Advanced Module	Linear deconvolution for pupil data
	Modeling overlapping responses with the <i>Unfold</i> toolbox
	Linking pupil dynamics to behavior and cognitive variables