Ecole Polytechnique Fédéral de Lausanne (EPFL)

Laboratory of Psychophysics (https://www.epfl.ch/labs/lpsy/) – Prof. Michael H. Herzog

Supervision: Simona Garobbio, PhD student

Title: The time course of age-related macular degeneration by using an innovative test battery evaluating both structural and functional aspects of the visual system

Background:

Visual deficits, such as age-related macular degeneration (AMD), are heterogenous. Patients experience different onsets and progressions of the disease, as well as different visual impacts. Vision itself is also heterogenous: a deficit in one visual ability (e.g., visual acuity) does not necessarily predict performance in another visual ability (e.g., motion discrimination or orientation detection).

Methods:

We have collected data from 50 patients with AMD and 50 healthy controls in collaboration with the Institute of Molecular and Clinical Ophthalmology Basel (IOB). Each participant completed a battery of five psychophysical tests and various imaging exams (including OCT). Participant were tested three times, with a one-year gap between each visit. The psychophysical tests included visual acuity, contrast sensitivity, motion discrimination, orientation detection, and visual search. Structural data were extracted from the imaging tests, such as the thickness of various retina layers (e.g., outer nuclear layer) for various subfields (e.g., inferior inner subfield). All patients had early to intermediate AMD at their first testing.

Aim of the project:

The aim of this project is to predict the course of the disease by combining structural and functional information. The selected candidate will conduct multidimensional data analysis, possibly using Python. Importantly, the project requires an understanding of the visual system, especially the retina and various visual functions.

Selected publications:
Garobbio S, Pilz KS, Kunchulia M, Herzog MH (2023) No common factor underlying decline of visual abilities in mild cognitive impairment. *Experimental Aging Research*, 49(3), p183-200. https://doi.org/10.1080/0361073X.2022.2094660

Anders P, Traber G, Hall U, Garobbio S, Chan E, Gabrani C, Camenzind H, Pfau M, Herzog MH & Scholl H. (2023). Evaluating Contrast Sensitivity in Early and Intermediate Age-Related Macular Degeneration with the Quick Contrast Sensitivity Function. Investigative ophthalmology & visual science. 64. 7. https://doi.org/10.1167/iovs.64.14.7