

The aim of the two seminars is to provide the students with the tools necessary to design experiments, collect data and analyze them in the fields of psychophysics (Winter Semester) and psychomotorics (Summer Semester).

The psychophysics seminar will deal with experimental methods which are commonly used to test hypotheses in perception, in particular vision. Possible examples are the fitting of psychometric curves to data obtained with the method of constant stimuli, the measurement of matching data in color research, the measurement of processing speed using masked visual presentation, the measurement of reaction times in visual search and the analysis of continuous reports in bistable perception.

The psychomotoric seminar will deal with experimental methods in the study of motor control, in particular for eye and hand movements. Possible examples are the measurement of saccades, smooth pursuit and fixational eye movements, as well as the measurement of manual pointing speed and precision, the measurement of maximum grip aperture in grasping and the analysis of movement kinematics in free drawing movements.

In both semester the students will work in groups of ideally 2-3 components. Each group will first study and discuss a classical paper which introduced one of the most widely used experimental paradigms in the respective fields of research. They will then collect and analyze a limited set of experimental data replicating those classic findings. The results will be presented in a final talk.

Among the skills which will be learned through the seminars is the programming of Matlab, which will be used as the main software for handling data in both semesters. In particular in the psychomotoric section the attendees will be instructed on the use of laboratory equipment like eye-trackers and motion-capture systems.

Readings:

*Psychophysics:*

Blake, R., Westendorf, D. H., & Overton, R. (1980). What is suppressed during binocular rivalry?. *Perception*, 9(2), 223-231.

Lotto, R. B., & Purves, D. (1999). The effects of color on brightness. *Nature neuroscience*, 2, 1010-1014.

Thorpe, S., Fize, D., & Marlot, C. (1996). Speed of processing in the human visual system. *Nature*, 381(6582), 520-522.

Wichmann, F. A., & Hill, N. J. (2001). The psychometric function: I. Fitting, sampling, and goodness of fit. *Perception & psychophysics*, 63(8), 1293-1313.

Wolfe, J. M. (1998). What can 1 million trials tell us about visual search?. *Psychological Science*, 9(1), 33-39.

*Psychomotorik:*

Bahill, A. T., Clark, M. R., & Stark, L. (1975). The main sequence, a tool for studying human eye movements. *Mathematical Biosciences*, 24(3), 191-204.

Deubel, H., Wolf, W., & Hauske, G. (1985). Adaptive gain control of saccadic eye movements. *Human neurobiology*, 5(4), 245-253.

Fitts, P. M. (1954). The information capacity of the human motor system in controlling the amplitude of movement. *Journal of experimental psychology*, 47(6), 381.

Jeannerod, M. (1981). Intersegmental coordination during reaching at natural visual objects. *Attention and performance IX*, 9, 153-168.

Lacquaniti, F., Terzuolo, C., & Viviani, P. (1983). The law relating the kinematic and figural aspects of drawing movements. *Acta psychologica*, 54(1), 115-130.