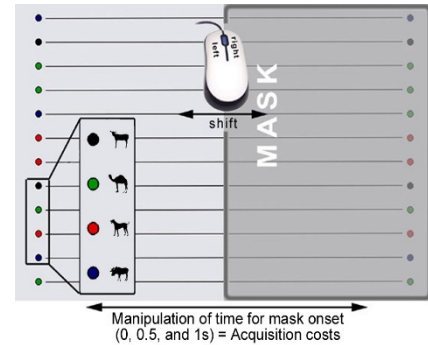




Student project in Visual Perception

Identification of working memory markers predicting individual strategies (trade-offs) in a comparative visual search paradigm

Background. The capacity (in terms of quantity as well as temporal considerations) of working memory (WM) is limited. If subjects were confronted with a comparative visual search task (CVS) where the costs for memorisation (i.e. complexity of the visual search items) and those for information acquisition (spatial/temporal separation of the search arrays) were manipulated, a manifestation of (memorisation vs. acquisition) trade-offs could be observed. These trade-offs reflect the amount of investment of the one or other strategy. Interestingly, such trade-offs were found as stable (given a particular manipulation) and individualized (i.e. each subject select another trade-off for the same kind of manipulation).



In this project we ask, (a) if the finding of stable and individualized trade-offs is reliable and (b) what are potential markers on the side of memory processes that allow us to predict the amount of memorisation strategy a particular subject preferred.

Project(s).

- Develop an experimental setup (psychophysically) by using MatLab technology and the PsychToolbox 3.
- Learn to use psychophysics and memory tasks to investigate trade-offs in CVS.
- Learn to create and to run a psychophysical experiment and data processing by the use of MatLab.
- Analyze behavioural data empirically and graphically and perform statistical tests to extract meaningful effects.

Methods. Visual psychophysics, d' - statistics, and MatLab programming of the experiments and the scripts for analysis.

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Level: The project is planned as BSc-project but can be extended to a MSc-project.

References.

- Droll JA, Hayhoe MM. 2007 Trade-offs between gaze and working memory use. *J. Exp. Psychol. Hum. Percept. Perform.* 33, 1352-1365.
- Hardiess G, Gillner S, Mallot HA. 2008 Head and eye movements and the role of memory limitations in a visual search paradigm. *J. Vis.* 8, 1-13.
- Hardiess G, Basten K, Mallot HA. 2011 Acquisition vs. memorization trade-offs are modulated by walking distance and pattern complexity in a large-scale copying paradigm. *PLoS One* 6.

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