Bachelor's/Master's thesis (or other type of student work) at the group of
Human Factors Engineering, Chair of Consumer Behavior (D-HEST)

Using visual attention test to assess fatigue

Fatigue is an important risk factor in safety at work. The early detection of fatigue in workers may help in preventing accidents or a drop in quality of work output. Moreover, there is also clear evidence for sleepiness causing impaired driving performance and accidents. Sleepiness can easily be quantified in terms of time of wakefulness. However, objectively detecting symptoms of fatigue is a challenge in an occupational environment as methods used for measuring the symptoms must be rapid, reliable and as non-obstrusive as possible.

A previous term paper (Xu, 2017) reviewed effects of sleepiness on attentional performance. Sleepiness was evidenced as a cause for an asymmetric attention performance in visual field. Our lab has developed a test for visual attention (fig. 1) fitting requirements of occupational practice and testing attention in various locations of the visual field. In the test, test takers report whether a flashed 6-digit number appearing on a background movie (car drive) includes the digit "3" (fig. 2). The test could be used for testing for asymmetry of attentional performance in the visual field and therefore the test could be used as an indicator for sleepiness.

Figure 1: Visual attention test set up: Participants position their head into a rest and observe the test images presented on the monitor.

Figure 2: Test image presented on the monitor: a 6-digit number flashes either on the left, center or right in the visual field.

The aim of this student work is to investigate the effects of sleepiness on the visual attention test. For this purpose, a group of tired individuals do the visual attention test. In parallel, individuals' fatigue is recorded with a standardized fatigue questionnaire. Questioinnaire data and results from the attention test are then correlated.

Tasks

- Familiarize with the visual attention test and previous work on the topic
- Design and run the study
- Analyze and discuss findings of the study
- Report achievements in a written report and in an oral presentation

Requirements

- Motivated to work with a visual attention test that is used in the industry
- Organizational skills
- Have basic skills in statistics or willing to learn such skills

Support and contacts

The Human Factors Engineering group can provide a broad interdisciplinary technical and scientific support and has a solid experience in the many disciplines required to run the project. For further information please contact: mmenozzi@ethz.ch or tanjab@ethz.ch
or call: 044 632 39 81 (M. Menozzi). Earliest start date is October, 2019. No latest start date.