

Improving accuracy of an attention test for testing medium and high performers

Inattention is an important risk factor in road safety. Measurement of attention performance in drivers may help in preventing accidents. We developed a computerized test for screening visual attention (fig. 1), for instance in traffic checks. This test, which has already been used in traffic controls in Germany, objectively determines the attention performance in a realistic situation. 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 has been configured such as to detect low performers. For moderate to high performers the test is too easy and therefore inaccurate.

We would like to modify the test to improve test accuracy when testing medium to high performers while keeping the test duration short (4 min). A shorter duration of the flashed 6-digit number increases the test difficulty but renders the test too difficult for low performers. An improvement of test accuracy while maintaining the test feasible for low performers is achieved by varying the duration of the flashed 6-digit number according to a so called adaptive psychophysical procedure. For instance, the duration could be controlled by a staircase procedure with a variable step size.



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 modify the current computerized test to improve test accuracy when testing medium and high performers by integrating an adaptive psychophysical test procedure. Implementation is validated by means of a user study.

Tasks

- Familiarize with the visual attention test and previous work on the topic
- Adapt current program of the visual attention test
- 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
- Good programming skills in C#
- 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 September, 2019. No latest start date.