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# Stress Generation and Measurement in Virtual Environments

Keywords: Virtual Reality, Stress Generation, Eye Tracking

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## Overview

Generating and measuring stress has been an interesting research topic for years. Not only does it help to understand and monitor the emotional state of a human being, but it may also allow to artificially induce stressful situations in applications, for instance, for training purposes.

Beside classically measuring brain activity or the skin response, there was shown that an emotionally stressful situation affects pupil dilation and the blink rate of a person. This can be especially useful in a virtual reality (VR) environment since some eye tracking equipment can be simply attached to head-mounted displays.

So far, a positive correlation of eye activity and stress has not been shown in VR, but will be inevitable since more and more training environments are developed for VR.



## Tasks

Your task is to research on stress detection and develop a concept how this could be tested in VR. Eventually, the focus of this implementation will lie on eye activity. Therefore, you integrate an off-the-shelf eye tracking device in an HTC Vive and conduct a user study to find such a correlation. The user study may be set in a premodelled virtual environment which should be extended with stressors (e.g. sounds, tasks, etc.).

You present your work in an intermediate and a final presentation to the ICVR lab. Finally, you summarise your results in a written report.

## Workpackages

- Literature research on the state-of-the-art of stress detection
- Integration and testing of the eye tracking device
- Extension of a virtual environment to include stressors
- User study and evaluation of recorded data
- Intermediate and final presentation
- Written report

## Skills

- Programming skills, preferably in C#/C++
- Unity and/or VR experience is a plus
- Strong communication and interpersonal skills

## Results

The results of this thesis need to be summarised in a written report and will be presented to the ICVR in a 20min talk.

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