UNIVERSITÄT BIELEFELD
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Medical Assistance Systems AG 2
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Evaluating Dynamic Scaffolding in HRI Through Eye-Tracking Analysis

This project is designed for students interested in writing a bachelor's thesis or conducting a project focused on the analysis of eye-tracking data within the context of human-robot interaction (HRI). The project aims to evaluate the effectiveness of dynamic scaffolding strategies in robot-guided tasks.

In a study, participants complete tasks while being guided by a robot using either dynamically generated scaffolding strategies or simple affirmation-based approaches. The goal of this project is to analyze eye-gaze patterns, fixation times, and other relevant eye-tracking metrics to identify potential correlations between visual attention, task performance, and the scaffolding strategy employed. By detecting patterns in gaze behavior, such as fixation durations and transitions between task-related areas, the project seeks to uncover how attentional focus relates to the effectiveness of different robot-explained strategies. The findings could offer valuable insights into how visual attention and cognitive load influence the need for scaffolding, ultimately contributing to the improvement of adaptive robot interactions.

Depending on the project's start date, the data may already be available for analysis. Alternatively, there could be an opportunity to assist with the data collection (conducting the study). The eye-tracking device used in the study is the Pupil Core from Pupil Labs. There is also room for your own ideas and wishes, allowing you to tailor the project to your specific interests and expertise.

Related literature

[1] https://docs.pupil-labs.com/core/
[2] https://pupil-labs.com/blog/what-is-eye-tracking
[3] Borys, Magdalena, and Małgorzata Plechawska-Wójcik. "Eye-tracking metrics in perception and visual attention research." EJMT 3 (2017): 11-23.

Medical assistance systems ranging from robots to smart home devices and apps provide support for people in physical and cognitive tasks. Based on a deep understanding of social interaction and human cognition, we develop effective intelligent assistance systems with the flexibility to co-construct interaction with different user groups (patients, relatives, doctors, nurses, etc.). This is achieved through a consistent *user-centered co-design*. Our goal is to support people in their well-being and participation through *studies and technology development* so that they can live autonomously and healthily.

More information is available at: `https://www.uni-bielefeld.de/fakultaeten/medizin/fakultaet/arbeitsgruppen/assistenzsysteme/`

Interested? @mail to `agross@techfak.uni-bielefeld.de`