Eye Tracker Assisted Learning System for Students with Dyslexia

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Abstract

Students' high level of motivation to learn is fundamental for their learning success. Specifically, students with various kinds of learning difficulties such as **dyslexia** can cause young people not to engage fully with the education system or drop out. Thanks to the advancement of assistive learning system and user modelling techniques for personalised learning, the different individual learning needs can be incorporated and met by personalising the learning environment based on user models.

The initial personalisation of learning content will be performed based on the registration form and the rules, and then the real-time user behaviour data will be recorded and used to update user's motivation, according to the real-time motivation, adaptive feedback will be output to user to sustain and enhance their motivation. Based on the data collected from eye tracker and multiple-choice questions in the learning system, the output will be different quantities of course materials with feedback to user according to their motivation and inference rules.

What You Need to Do

This is a development project, which uses eye tracker hardware to capture user's eye gaze stream data and learning performance data to output adaptive feedback to the user to improve their learning motivation and performance.

What you need to do is to design a system/software which can:

- contain a presentation mechanism for the learning materials, in the formats of texts, images and/or videos. Learning materials also contain quizzes in the format of multiple-choice questions.
- capture the user's eye gaze stream data when a user is learning with the learning materials.
- capture the user's performance data from the quizzes in the learning materials.
- read and process the captured eye gaze stream data as well as the performance data from the quizzes, to generate feedback to the user using provided algorithms/ranges. The feedback could be pop-up text messages or alarms etc. on the screen.

What You Will Get

- A Tobii eye tracker hardware (Manufacturer website: https://www.tobii.com/)
- Its SDKs, for PCs to communicate with the hardware (Tobii Developer Zone: https://developer.tobii.com/)
- Learning materials
- Rules/Ranges, for processing data to give feedbacks to users.

Technical Highlights

- Utilisation of Tobii eye tracker SDKs to convey eye tracking gaze stream data to your own application
- Programming logics for reading and processing the captured data to give feedback based on the rules provided

Deliverables

- An eye tracker assisted learning system/software
- Full documents which demonstrate the design

Research Questions for Your Choice (At least one of them)

- Assistive Technology in Supporting Users with Learning Difficulties such as Dyslexia
- How eye tracker embedded learning applications assist with learning
- State of The Art in IoT
- Any other relevant ones

Benefits

This project will apply eye tracker SDKs to your own application, to achieve the communication between PC and this hardware. When we design a system/software with other hardware, the way is like that you use this eye tracker. You could learn much practical knowledge during your development process, and you can extend this to the cases using other devices.