

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.

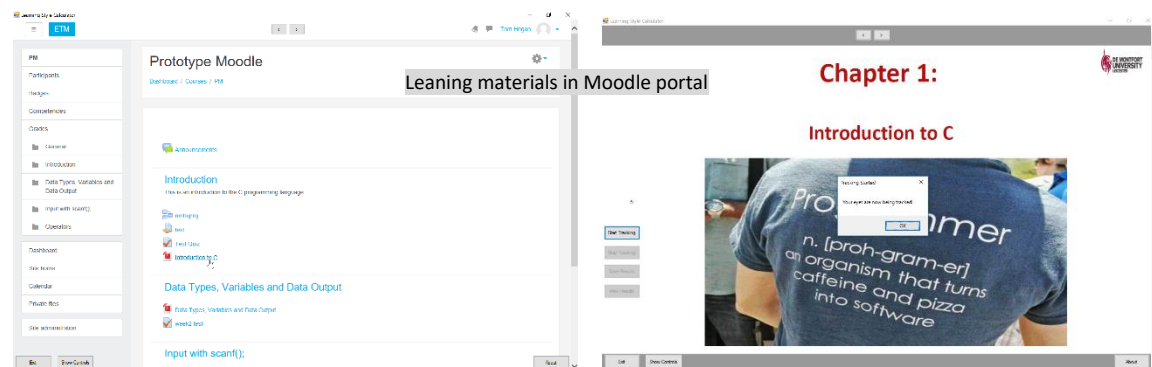
The initial personalisation of learning content will be performed based on the motivation questionnaire and the rules, and then the real-time user behaviour data will be recorded and used to update user's motivation, according to the real-time motivation, adaptive feedback will be output to user to sustain and enhance their motivation. Based on the data collection from eye tracker and Moodle website, the output will be different quantities of course materials with feedback to user according to their motivation and inference rules.

Prerequisite

1. Interests
2. Basic programming knowledge

Description

This is a development project. What you need to do is primarily designing a software which can process the data from Tobii eye tracker hardware. This software must contain basic web browser function (or other creative ways to access materials in Moodle website) used to login Moodle learning system to review learning materials to generate eye tracking data. After learning the materials, each user will have a grade report containing their overall grades and the grades for each question which can be exported from Moodle to local machine. Therefore, this system comprises three parts. **1. From user's eye movement when using Moodle website with embedded eye tracker, eye tracking data will be generated continuously; 2. System captures and processes eye tracking data. 3. Combining with step 2 data, necessary I/O operations should be designed to read data from exported grade report for system to process to generate feedback according to provided rules/ranges.**



Difficulties

1. The difficulty might be mainly the utilisation of Tobii eye tracker SDK to convey eye tracking data to your own programme.
2. I/O operations for reading and processing generated grade report after user's learning

Support

1. An eye tracker hardware from Tobii (Manufacturer website: <https://www.tobii.com/>) will be provided for development and test. The SDK packages and tools together with development documentation are available at <http://developer.tobii.com/>.

2. We will help deploy Moodle server used to review learning materials in your machine and tell you how to use it. What you need to do with Moodle is to make sure your software containing web browser function can login and review learning materials we provided in Moodle portal.

3. The motivation questionnaire and rules/score-ranges for generating user's feedbacks will be provided.
4. An existing software with some basic functions and its source code in C++ will be provided for your reference. The system can continually monitor learners' eye movements when they are using the system along with the percentage of eye gaze time spent on text, images and out of the screen.

Deliverables

1. A designed eye tracker assisted learning system/software which can

(1) capture and process eye tracking data generated from Tobii eye tracker

(2) read data in Moodle's exported grade report, then generate feedbacks for users according to provided rules/score-range

If this system is desktop-based, it must contain web browser function which used to login and review learning materials in Moodle website.

2. Full documents which demonstrate design process.

Tips

1. Possible Techniques for Your Choice: *Win Form or WPF development frameworks supported by C#, C++ or VB which can be easily developed in Visual Studio or others for your own interests*

2. Regarding web browser function in desktop-based software, for example, in WPF development framework, web browser control is ready-to-use or others for your own interests.