Overview

Eye-tracking based solutions for computer use for persons with disabilities are expensive and therefore out-of-reach for many people. Our sponsor presented us with a $150 camera, the Intel RealSense SR300, and our goal was to determine if this camera could be a viable, cheap alternative for eye-tracking. Since we were a large team (7 people when the average is 4) we were also given a second task, to come up with software to test various different input methods for computers.

Objectives

- Determine if the Intel RealSense is a viable option for an eye-tracking-based solution for computer use
- Develop a program to test the effectiveness of any cursor-based input method for computers

Approach

Intel RealSense Evaluation and Improvement

- Determine what last semesters team did and how they improved on the original code
- Look at why the data is still inaccurate
- Apply filters to improve the data, smoothing and low-pass filters
- Test the level of stress and strain on a user trying to use our software

Input Evaluation Software

- Create a Java application that acquires and records data from a set of trials that challenge the user to move their cursor efficiently and click a target quickly
- Procure useful statistics such as “time to target,” “R-squared,” and “fluency” from the application to provide insight about the path the cursor is taking
- Evaluate the data to determine whether the cursor-based based input method was accurate and capable

Outcomes

- Our sponsor now has a clearer idea as to whether or not they should continue the development of eye-tracking software for the Intel RealSense
- The eye-tracking software is improved and more usable than previously
- Our sponsor now has a one-of-a-kind evaluation software that can be used across the field to determine the ease of use any cursor-based input method