uOttawa
Faculté de génie
Faculty of Engineering

Deliverable G
Prototype II and Customer Feedback

IlluminEye

Sum Ki Kelsie Ling
Roz Diella Tikum Ngo Sii
Thomas Harvey
Stephanie Chiamaka Obasi

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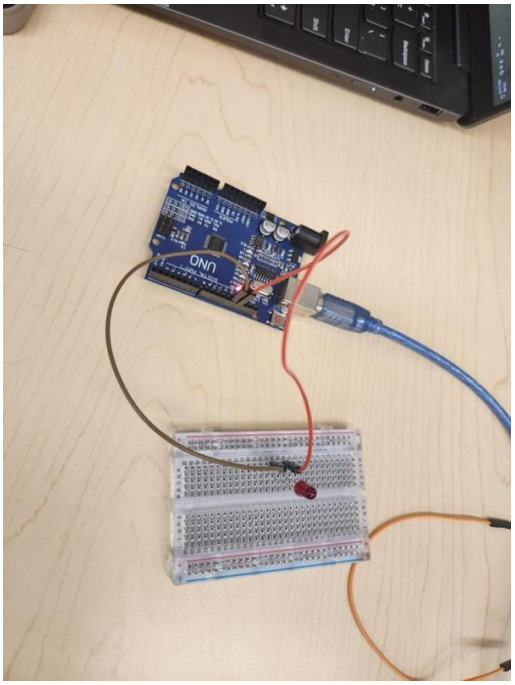
1. ## Prototype 2

Prototype 2 is a focused prototype that is aimed at getting a response from the Arduino when an obstacle is detected. A circuit was made on the Arduino using an LED and 2 wires. We then wrote a C++ code for the Arduino to receive signals from the computer and light up the LED. The C++ code was uploaded onto the Arduino UNO, and we ran the python code from VSCode onto the Arduino through serial connection.



Analysis and Results

The purpose of this prototype is to be able to receive a response from the Arduino when an object is detected by the camera from a certain distance. Although we successfully made the circuit on the Arduino, the LED lit up successfully and the Arduino successfully received signals from the VSCode as seen from the blinking TX point on the Arduino, the LED was unsuccessful in turning off when the object was 25 cm away, which we decided was a safe distance away from the user, from the camera.

Feedback

The client was pleased with our design and ideas but advised to show more emphasis in implementing the APIs into our design.

Prototype 3

Our previous prototypes have been focused, each on a critical subsystem. In our first prototype our group tested our software's ability to use a camera to detect obstacles within its field of view. Ensuring the software's capabilities were functioning to our team's standards was crucial before proceeding to our second prototype plan in which the response of the software's detection of an obstacle was tested. With those subsystems functioning, our group seeking additional feedback on the combination of our focused prototypes. An objective of a third round of prototype testing is to reduce uncertainty in the functionality of our design meeting our desired result.

Prototype Plan

Prototype 3 will be a comprehensive prototype with very high fidelity to the final product. In this stage of testing, our group seeks to gain an understanding of how our design will assist a visually impaired individual in practice.

Execution

Testing will consist of a series of user simulations. Similar to our testing for Prototype 1, each simulation will consist of a team member holding a laptop to their chest facing outwards with our software running, this team member will henceforth be called the user. This is a high-fidelity test where the laptop camera is acting as the camera which would be in the smart glasses. A simulation consists of the user attempting to navigate through an environment with a set route with remaining team members acting as obstacles. In each simulation, variation of the environment, the start and end point, the user pace, and the obstacles speed and positioning. Each of these simulations will be between 30 seconds to 2 minutes. After each simulation data shall be recorded on the effectiveness of detecting and alerting of obstacles.

Interpret

The intentions of this testing are to monitor if the design is producing the responses that it should, and that the design is useful and does assist the user. Interpreting the data collected from each simulation will provide feedback on whether the design is functioning as intended. If the design is functioning it can be said that it is useful in providing assistance.

Stopping Criteria

The test can be stopped when 100% of detections produce a response from the Arduino.