Preliminary design for visually impaired assistance device.

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Project statement

The device to be built is designed to provide accessibility support, specifically, to the visually imparied. The device will use an infrared sensor in order to detect nearby objects and will then provide feedback to the user via vibration motor. The system will also include green and red LEDs with the red being on when not near an object, and green activating when it is. These can be used to check if there is an issue with the vibration motor and for people who have poor eyesight, but not no eyesight. For someone who has poor eyesight, this device can act as additional feedback for navigating rooms. The device could be used to detect an object and will alert the user using the vibration motor which should provide a distinct signal to the user, while being relatively non-distracting to people nearby.

Constraints

- The program must run continuously while the device is operating.
- The hardware, and in particular, the infrared sensor must be moveable to an extent(sensor must be moveable for demonstration purposes)
- The vibration motor must be strong enough to be easily detectable, but not strong to the point that it can potentially disturb components or be unpleasant to hold.
- Connections between components must be firmly connected in order to avoid being shook loose by the vibration motor.

Specifications

- The Infrared light sensor should trigger an input when near an object that it's pointing at.
- The vibrator motor will activate when infrared light is triggered.
- The system will activate a green LED while not near an object
- The system will activate a red LED while near an object.
- The sensor and rumble motor should ideally be physically connected so that they can be used as a cohesive unit.

Asks:

Purpose

This system is designed to provide feedback in the form of vibrators to a user who is visually impaired. By vibrating when the device is near an object, the user can use this device as a supplement for their vision.

Inputs

The system will have an Infrared sensor for detecting objects near it.

Outputs

A vibration motor and two LEDs, one red, one green. The motor will output vibrations when the input is triggered, and the

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Preliminary BOM

- Nucleo L4R5ZI
- Micro USB to USB type A cable
- A computer running MBED studio
- Jumpers
- Vibration motor
- Infrared sensor
- A Breadboard
- Two LEDs, one red, the other green
- Two resistors