

Requirements

Reliably provides feedback from sensors
Has an on/off switch for the whole device
Has a separate on/off switch for the color identifier
Uses Raspberry Pi and Python

Comfortable to wear
Fashionable
Portable
Non-invasive
Easy to use while blind
Cost-effective. Should be at most \$70 per unit

Sensors

Rgb sensor - when the rgb sensor determines the color which the sensor is facing it will use recorded voice clips and play them through the speaker to allow the user to determine the color.

Ultrasonic - will determine how far the user is from the object or wall and then will use the speaker as an output and make a chirping sound louder and more frequent as you get closer.

Infrared sensor - will determine if there is a moving object in front of the user and will vibrate if no moving object then it will not vibrate.

Vibration motor - will act as an output for the infrared sensor to vibrate as the user is in the field of the moving object.

Speaker - will act as an output for rgb sensor and ultrasonic sensor by saying the color or chirping if getting closer to an object

Button - will use a button for one press to turn off the color sensor so it does not function and is not annoying and keeps saying color or if pressed two times it will turn the whole device on and off so the user can choose to have it running or not.

Project Description & Objectives

The goal of this project is to create a noninvasive, fashionable, and portable device that simplifies daily activities for vision impaired people. The project must contain a variety of different sensors and be based around a Raspberry Pi with coding done in Python.

This project will improve navigation for the visually impaired. It will improve confidence in movement and provide additional sensory feedback to reduce collisions above the waist. An ultrasonic distance sensor triggers a buzzer to alert the user of an obstacle ahead. The buzzers are on the interior of the device. Infrared sensors provide additional situational awareness by alerting the user to other people

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nearby with an audio cue. The speakers are on the neck of the device. Additionally, an included RGB sensor will allow for easier color identification, which is useful when coordinating outfits. In order to be fashionable, the product has a sleek and rounded design. It will come with different color skins that have their color written on in braille, but the default will be black.

