

ROV3R: Robotic Guiding for the Blind

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Abstract

The purpose of this project is to develop a product that gives the visually impaired independence to safely travel on their own.

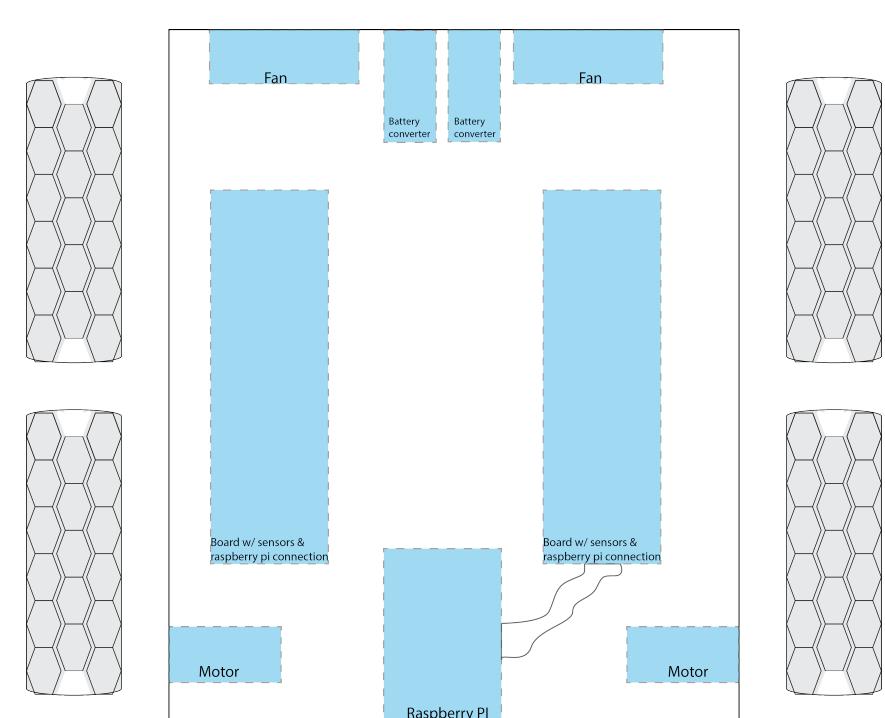
The robotic guide is equipped with ultrasonic sensors to detect numerous obstacles the user may encounter.

The robot is interactive with the user and can verbally describe the environment around it.



Introduction

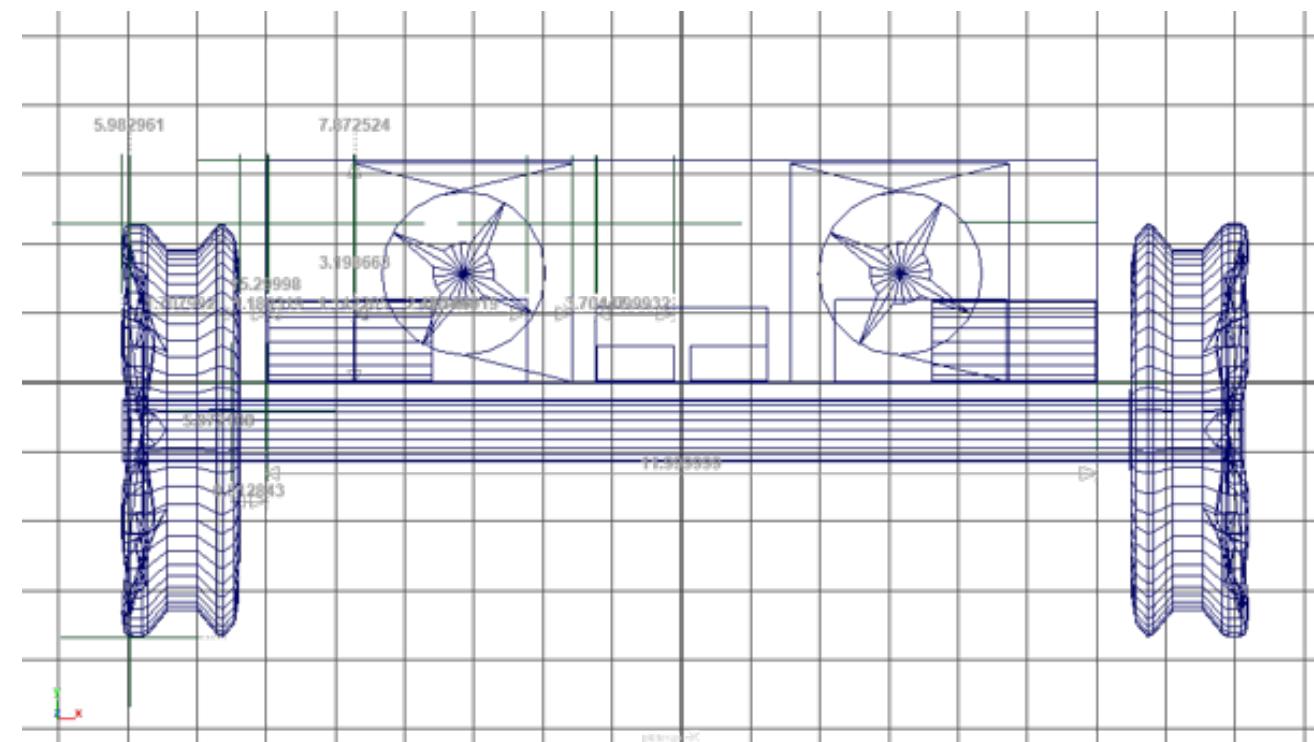
Current solutions to the guidance of the visually impaired are functional, however are not perfect for the ultimate goal of independence and safety.



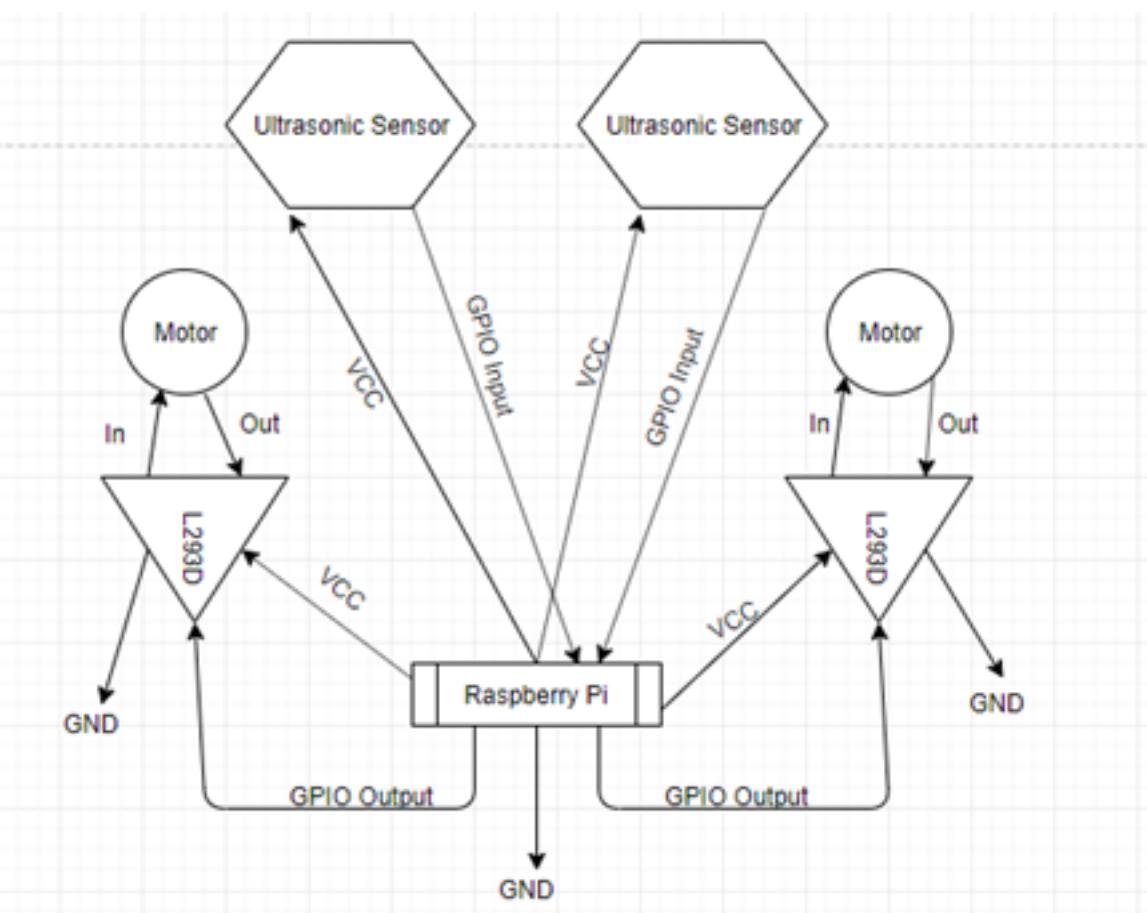
A feasible solution to the problems that blind individuals face on a daily basis is a robot to help guide them through their environment.

Methods and Materials

The robot's voltage control board connects to four motors that drive the robot and the computer. The computer will control the interactions with the GPS, speaker, microphone, on/off button, and the information from the other various sensors.



The motor control system is a vital part of our robot. It is going to be what ultimately guides the user around obstacles that are in front, above, below, or to the sides of them. It does this through 3 different components that give commands on how the motors should run in any given circumstance.



Discussion / Results

- Electrical components within the design that require voltages and currents were tested/observed to show that the design meets them.
- A GPIO emulator was used to simulate the motor control python script.
- A stress test from the handle to the casing was conducted on the robot as well, which shows the casing can fully accept the handle and force from users.

Conclusions

Tasks others find simple, such as walking in a straight line, are impossible for the visually impaired.

The robotic guiding device provides an effective and efficient way for the visually impaired to travel. From sensing obstacles to communicating with the user, R0V3R is there to help.

Acknowledgements

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