

Technology for the Visually Impaired

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Objective

The objective of the project is to improve the quality of daily life for those who are visually impaired.

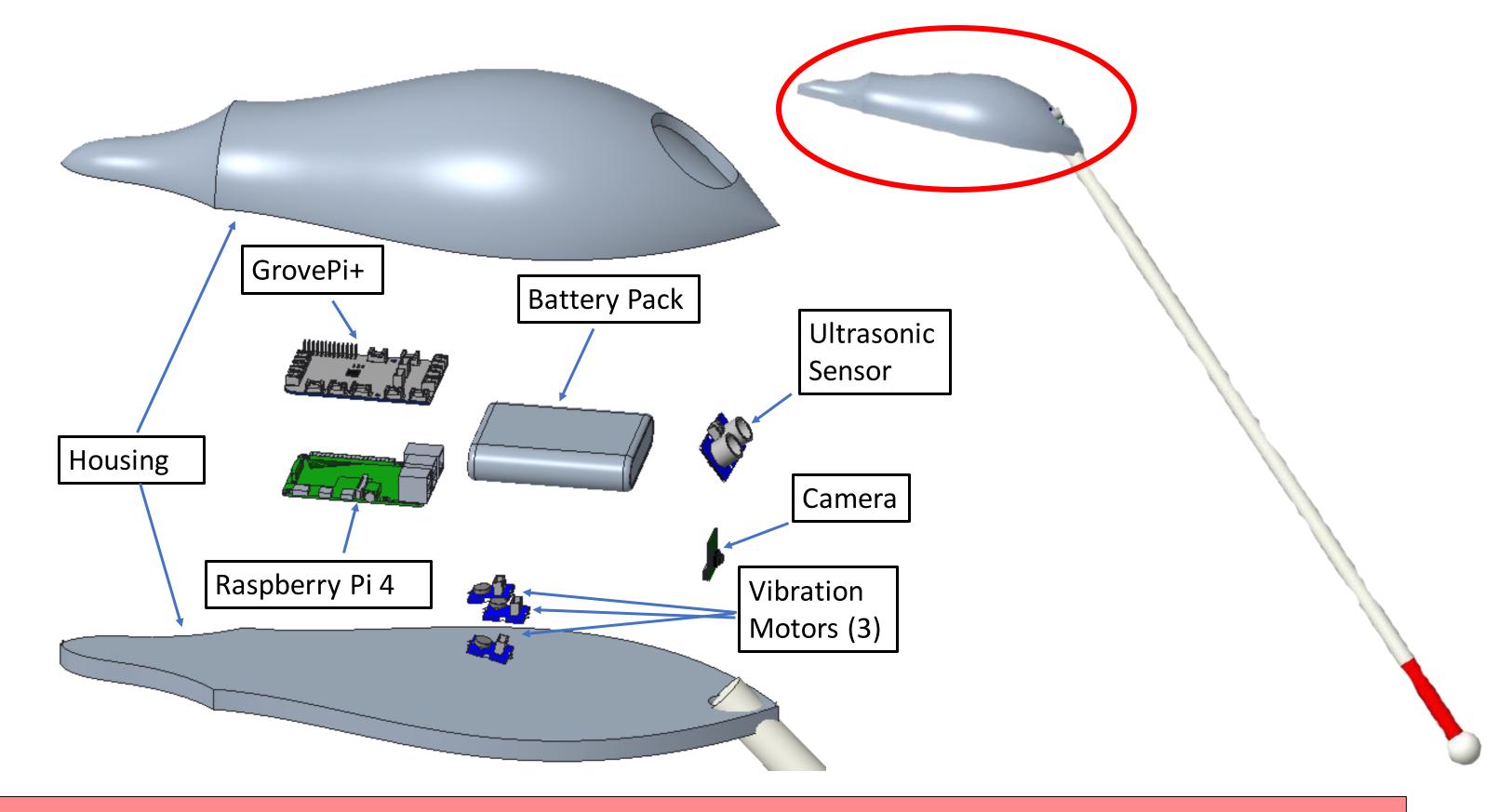
Background

- Individuals who are visually impaired or blind have been limited to simple products for navigation uses.
- Current competing products are often too expensive and require extensive training for its use.
- Some skills can be used to learn about their surroundings but are mainly tactile and uncomfortable to the user.
- The normal white cane only covers the lower range of motion, leaving the area above the waist unknown.

Motivation

- 109,000 of the 1.3 million legally blind people in the United States use a white cane.
- The annual earnings and poverty status of non-institutionalized persons aged twenty-one to sixty-four years with a visual disability in the United States in 2016 had a Median Annual Earnings of \$38,500.
- This population suffers from impairment that makes simple tasks difficult and even hinders these people from obtaining and maintaining employment.

Assembly



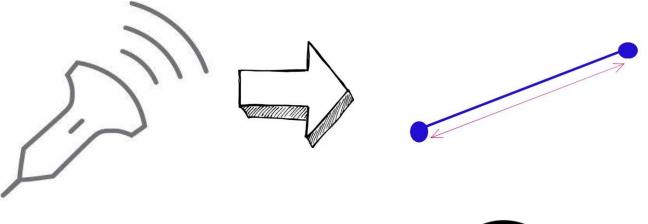
Functions

Sense

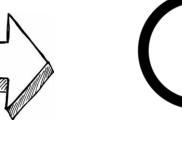
The ultrasonic sensor will sense an object up to 3 meters away.

Determine

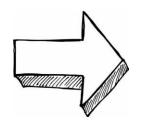
The Raspberry Pi will interpret the sensed information to calculate the proximity to an object.













Haptic feedback will alert the

user with **multiple motors**

with intensity based

The **camera** can be **activated** to scan the desired products.

Scan

Identify

Up to 500 stored products will be in the memory of the Raspberry Pi to identify the product.

Notify

Alert

on distance.

Haptic feedback will notify the user when the product has been identified.

Potential Challenges

- Heat dissipation within the device housing
- Equipment is kept safe when used in all weather
- Operational Time Information is translated to user in a quick and accurate manner
- Ergonomics Device is comfortable for the user to use for extended periods of time
- Waterproof Keep electrical equipment safe

Project Constraints

Weight: < 5 pounds</p>

■ Cost: < \$350

Adaptability: User can intuitively use device

Future Work

- Finalize part arrangement design
- Order parts
- Test for adequate heat ventilation
- Construct housing for mounting components
- Test product with volunteer O&M specialists
- Complete InNOLEvation documents and compete during Spring
- Participate in Engineering Shark Tank