HaptoTech: Creating Wearable Proximity Warning Devices for the Visually Impaired

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Problem: 285 million people in the world are visually impaired, representing a staggering 4% of our population. Currently-available assistive devices for the blind are either somewhat crude (for example a white cane), or expensive, like a guide dog. My aim with this project was to design, fabricate, and package an inexpensive, high-tech solution for blind navigation. Device Design Constraints: - The device must perform its intended function: Aiding the visually impaired in navigating home, office, and other indoor environments. - The device must be small. - The device must be able to withstand typical stress from daily use. - The device's feedback must be intuitive enough for someone to understand its operation with a short learning curve. - The device must cost less than $30. Fabrication and Coding: I performed all design and fabrication in my home. After numerous iterations, I developed a family of suitable solutions. These solutions run on various versions of my proprietary software that I programmed to fit a wide variety of my HaptoTech models. Conclusion: After constructing many different designs, I developed a series of devices that satisfy all constraints. My devices function by providing subtle vibrations to the user when they are close to an object. Different vibration patterns allow the user to have a general understanding of the proximity of objects in their surroundings, allowing them to navigate indoor environments without the use of sight.

Awards Won:

Fourth Award of $500