EyeTouch – Refreshable Braille Display

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Abstract

EYE : : OUCH

EyeTouch is a portable **braille converter** that translates text (i.e., messages, pdf, webpages, etc.) shown on a phone/ tablet/ personal computers into readable braille.

Our translator is designed to limit the need for audio assistance and allows users to rely on touch only. EyeTouch can be used for both **educational** and **personal** purposes.

Background

- ❑ There are **1.3 million** legally blind people in the United States alone, and more than 285 million visually impaired worldwide.
- ❑ Fewer than **10%** of blind individuals can understand braille, mostly due to a chronic instructor shortage and inadequate education tools.
- ❑ Current technology available is **expensive** and **cumbersome** to Braille users.
- ❑ In today's market there is no product that is as **portable** and **user-friendly** as our EyeTouch.

Motivation and Goals

- ❑ Our goal for this project is to provide visually-impaired Braille users with a portable English-to-Braille converter.
- ❑ We want to create a product that will benefit other individuals and potentially provide them with more opportunities than they already have.
- ❑ Our final product must be user-friendly, portable, and cost effective. One of our big goals is to target this product towards average-income houses.

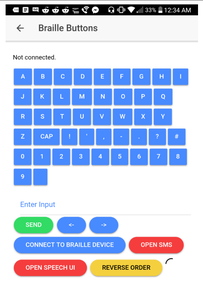
Acknowledgement

We would like to thank the Vision Loss Alliance of New Jersey for their collaboration and support.

Methodology and Results

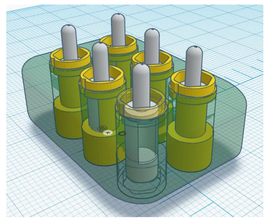
Software

- Converted English text to Braille [2]
- Created our own app to run in the background



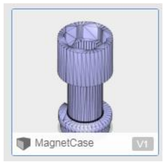
Hardware

- Decrypts signals and displays message as Braille characters
- LED display at the moment
- Arduino [1] was used in order to communicate with the software



Display

- The user will only feel the pins moving
- The device being held is 3D printed
- The pin's design was inspired by various open source projects [3]



Our product works both in communication with software and hardware, and the logic for the Braille display. We have been testing the display through LED lights, but we are now in the process of moving to pin mechanics.

Tools Used

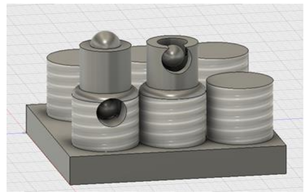
IONIC

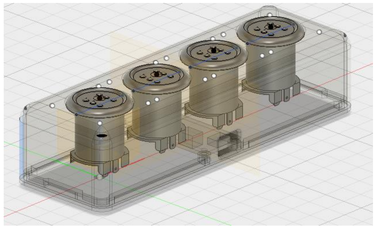
JavaScript

Future Work

Future in Technology

- ❑ Prototype a user-friendly model of our design.
- ❑ Maximize efficiency while also minimizing costs.
- ❑ Complete 3D printed model of our prototype.
- ❑ Extend the applications of our product to include other necessities.





Future in Outreach

- ❑ Test out product for usability.
- ❑ Collaborate with companies tailored for Braille users.
- ❑ Introduce the idea of our product into daily life for Braille users.
- ❑ Redesign and improve our product as users see fit.

Vision Loss Alliance of New Jersey

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References

[1] Arduino. "Serial to Parallel Shifting-Out with a 74HC595." Arduino - ShiftOut, www.arduino.cc/en/Tutorial/ShiftOut.
[2] Ionic, Drifty. "Ionic Documentation." Ionic Framework, ionicframework.com/docs/.
[3] Madaeon. "MOLBED Modular Low Cost Braille Electronic Display." Hackaday.io, 10 Nov. 2016, hackaday.io/project/12442-molbed-modular-low-cost-braille-electronic-display.