Techblazers Project Proposal

Victor Siooh, Emmitt Brandt, Chase Williams, Slate Jordan, Chief Boateng

Problem:

Those who are visually impaired have trouble viewing objects such as text on a computer or letters on a keyboard key. Computer keyboards can be quite difficult to view for these individuals due to factors such as small typeface on the keys or difficulty perceiving the contrast on a particular keyboard. In addition, a lack of knowledge on touch typing can slow performance at the computer, resulting in increased time and difficulty creating or modifying documents. The repeated up and down head movement as somebody who does not know how to type by feel looking constantly up and down from keyboard to screen can result in neck or back strain as well as further increasing time spent re-orienting one's view of the keyboard and screen over and over again.

Solution:

The Keyboard Finger Position Display allows the visually impaired to view which keyboard keys are being touched without them needing to look down at the keyboard. When a key is touched on the physical keyboard, an on-screen keyboard app on the user's computer indicates which key has been touched. Due to everyone's vision problems being different, we are adding several customization features. To account for this, the user will be able to change the font type, font size, font color, background color, the color of each key, and the transparency of the on-screen keyboard.

Prototype v End Product:

Prototype	End Product
12 keys had capacitive touch sensing.	60% keyboard (all 61 keys on the main portion) will have capacitive touch sensing.
The microcontroller code is only able to read touches on 48 keys.	The microcontroller code can read touches on 61 keys.
Wiring was soldered to aluminum tape and attached above the keycaps	Wiring will be integrated underneath the keycaps
Wire size: 26 AWG	Wire size: 30 AWG
No auditory feedback	Auditory feedback
Running from Visual studio code	Running from an application
Does not save keyboard app settings	Saves keyboard app settings
Two adjustable contrast settings	Several contrast options
Hard-coded font size, transparency, font, and key size	Adjustable font size, transparency, font, and key size
Hardware such as Arduino Nano and the MPR121 Capacitive Touch sensors were visible to the user	A compartment will house the hardware and be placed inside the keyboard.