



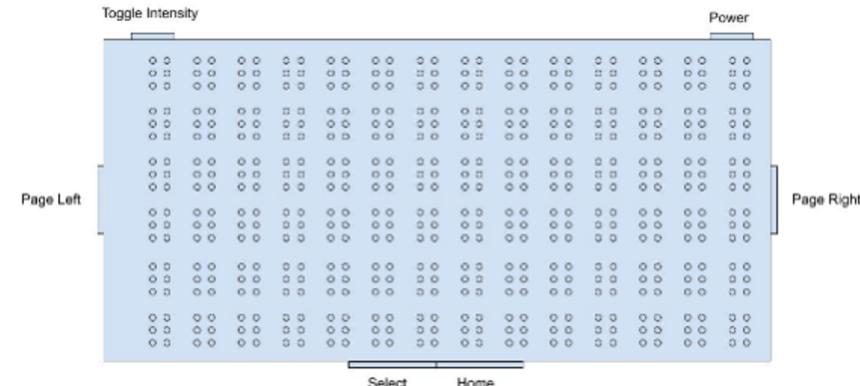
Blindle

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CREATING THE NEXT®

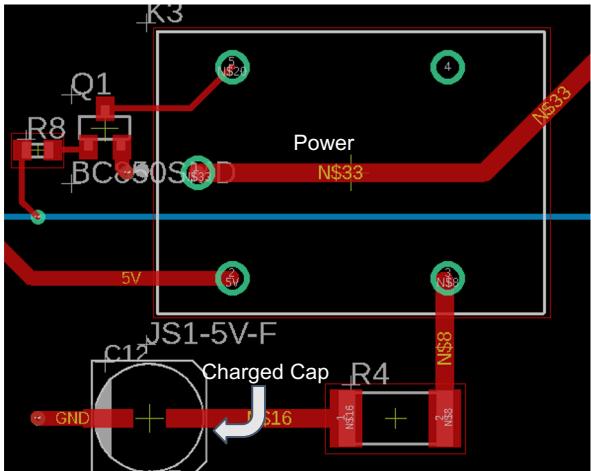
Introduction

- Blindle is a portable e-reader that uses electrotactile stimulation to display an array of 6x14 braille characters
 - 5 push-buttons
 - Potentiometer
 - Removable storage device
 - Web application



Sensation

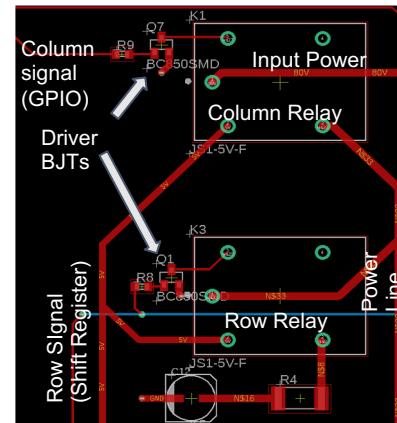
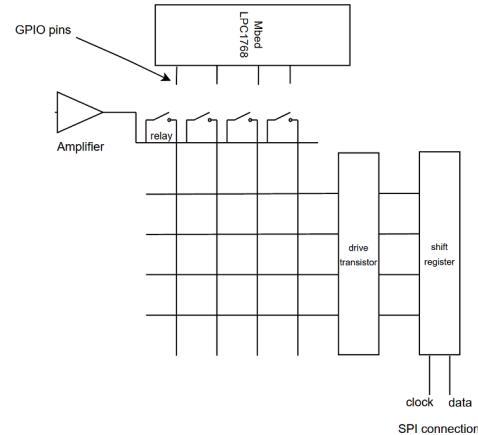
- Capacitor discharges into finger
- Variable power supply from ~60-100V



Voltage	Person 1	Person 2	Person 3
50V	X	X	X
55V	X	X	X
60V	X	X	X
65V	X	X	X
70V	X	X	X
75V	Slight Sting	Slight Sting	X
80V	Strong Sting	Slight String	X
85V	Uncomfortable	Strong Sting	Slight Sting
90V	NA	Uncomfortable	Slight Sting
95V	NA	NA	Slight Sting
100V	NA	NA	Slight Sting

Signal Select

- GPIO pins control column select
 - Each column turned on or off depending on GPIO signal
- Shift registers control row select:
 - ‘Clock’ signal sent out to cycle through cell rows
 - Each point represents a single pin in the array
 - Every 3 rows / 2 columns represents a separate braille cell
 - Traverse across the array left to right

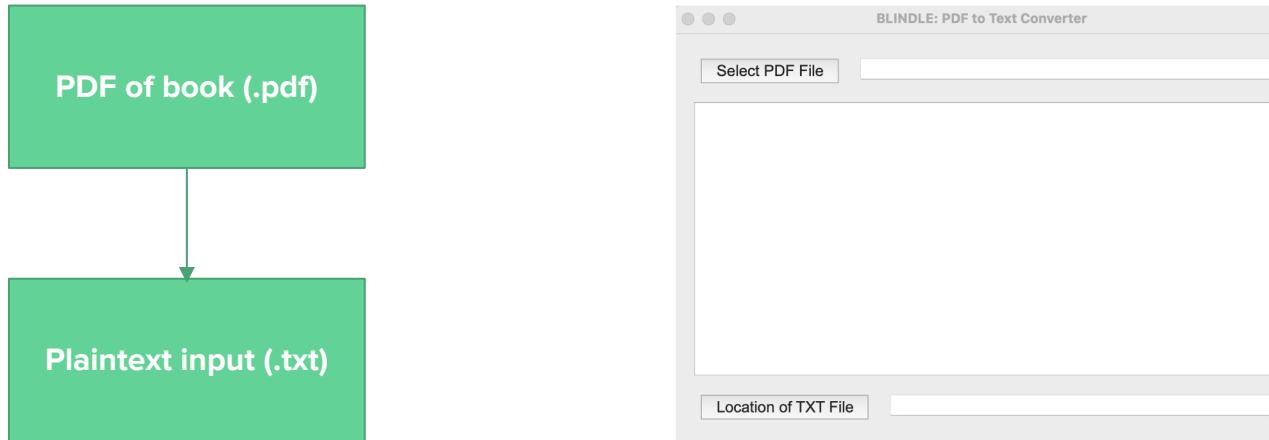


Changing “Pages”

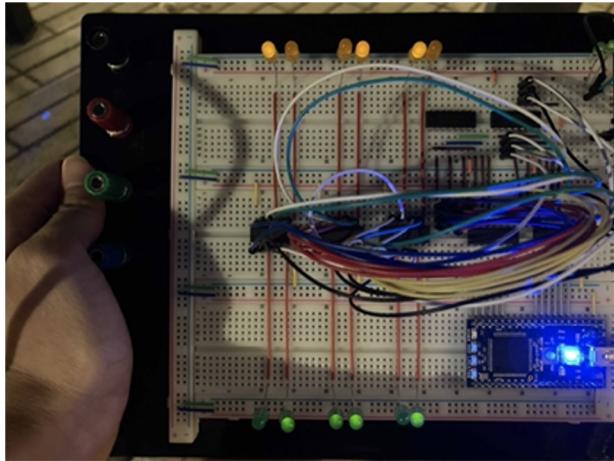
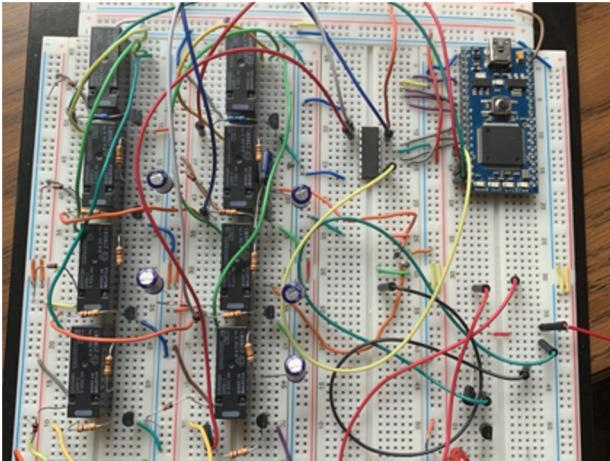
- SD card stores look-up table with braille patterns
- Next page button
 - A button interrupt is set within the program to change the page. We use the interrupt to ensure that the page turn is execute as soon user presses the button.
 - The interrupt function loads the next “page” of text in the text file, converts it to braille and displays it to the LED
- Implemented on the demux set up given time constraints.

Web Application (GUI)

- Lookup table for Braille translation in MCU uses plaintext format, so .txt conversion is required.



Our Prototype



- Hardware demonstration
 - 2x4 braille cell array
 - Shift register signal select
 - Relays and capacitors for electrotactile stimulation
- Software demonstration
 - 2x4 braille cell array
 - Demux signal select
 - LEDs for visibility to show page parsing

Questions?