DYNABRAILLE

Brailliant Solutions

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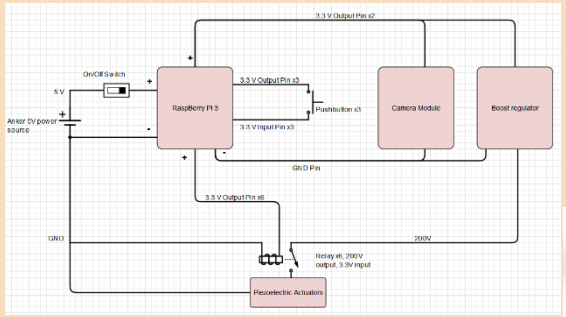
BACKGROUND

In the modern day and age, **visual impairment** can be a big disadvantage and cause many difficulties in life. One of the biggest problems the visually impaired encounter is the **inability to read plain text**. Simple things in life such as reading mail or signs can't be done.

Solution

Brailliant Solutions has designed **DynaBraille**, a state-of-the-art handheld assistive device which will revolutionize the lives of the visually impaired. **DynaBraille** scans plain text and instantly **translates** it into an easily readable **Braille** format.

SYSTEM OVERVIEW



Electrical Schematic

Device Housing

USAGE

Scan → Process → Output

Scan: User takes a picture of the desired text using device
Process: Device translates the picture into a text format
Output: The Dynamic Braille Pad outputs braille characters

HARDWARE

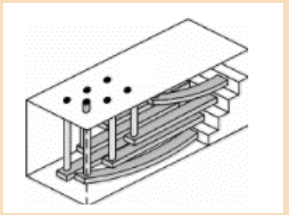
Raspberry Pi 3

- Main device controller
- Open source development
- Expandable memory slot
- Strong processing power

Raspberry Pi 3 [1]

Actuators

- **Piezoelectric** material
- Low energy and small
- Fast response time
- Long lasting and durable



Actuator layout

Boost Converter

- DC to DC step-up transformer
- Input range: **3-5V**
- Output range: **200-620V**
- Meets piezoelectric actuator voltage requirement of **200V**

Boost Converter [2]

SOFTWARE

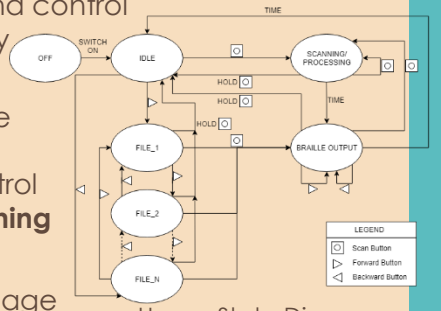
- System and firmware developed using **C++**
- Easy hardware access and control
- Experience and familiarity

RaspiCam API

- Allows **interfacing** with the Raspberry Pi camera
- Provides methods to control **exposure** and other **fine tuning**

Tesseract OCR

- Translates text from an image into a text file using open source **Optical Character Recognition**



Usage State Diagram

CONCLUSION

There are over **285 million** people in the world who are **visually impaired** [3], and we truly believe that **DynaBraille** can revolutionize lives in this community. Aside from a brilliant product idea, extensive hardware and software design has come together to ensure a **reliable** and **high quality** product.

References

[1] https://www.raspberrypi.org/products/raspberry-pi-3-model-b/
[2] https://www.amazon.com/Yeeco-Converter-Regulator-Stabilizer-Adjustable/dp/B011EBSKK0
[3] http://www.who.int/blindness/GLOBALDATAFINALforweb.pdf