



Created by Billy at Shedtech – Bringing technology out of the lab and to your shed!

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Youtube <https://www.youtube.com/channel/UCSLhccJc34ZIHV2Sk5as9ug>

This is my version of the morality machine from the movie Demolition Man.
It uses a speech to text algorithm to match spoken words to a list of profanities.
Once detected the speakers let the user know they have been detected making
a morality violation, and it also prints a citation.

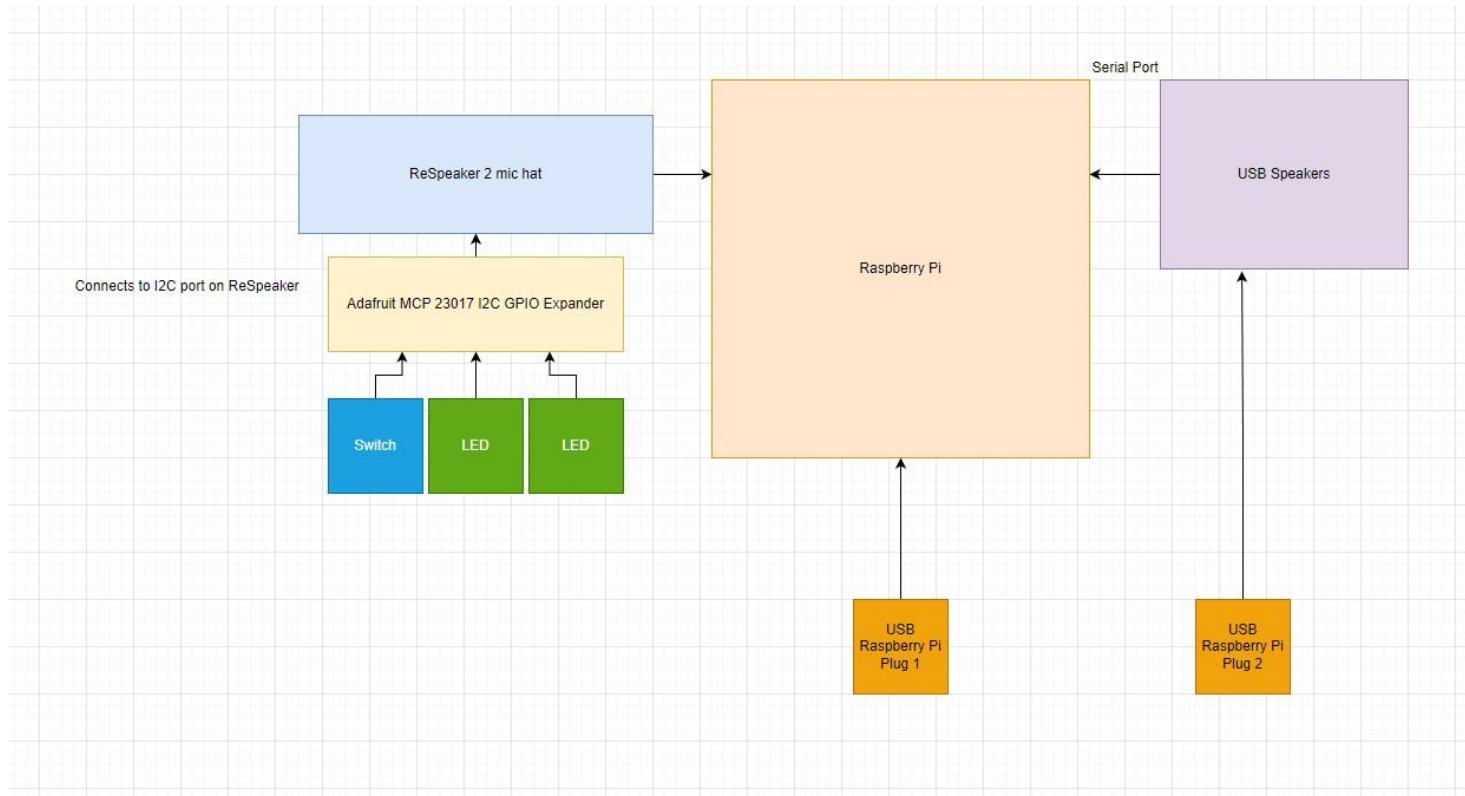
Parts List

1. Raspberry pi
2. Respeaker hat - <https://shop.pimoroni.com/products/respeaker-2-mics-phat?variant=49979573706>
3. Thermal printer - <https://shop.pimoroni.com/products/mini-thermal-printer?variant=28412531207>
4. Adafruit MCP23017 - <https://thepihut.com/products/adafruit-mcp23017-i2c-gpio-expander-breakout-stemma-qt-qwiic>
5. USB Speakers - <https://thepihut.com/products/mini-external-usb-stereo-speaker>
6. Momentary push button x 1 - https://www.amazon.co.uk/eROOSI-Momentary-Switches-industrial-controlling/dp/B098TDHK3D/ref=sr_1_16?keywords=push+button&qid=1668780803&srefix=push+b%2Caps%2C70&sr=8-16
7. Red LED's x 2 - https://www.amazon.co.uk/Round-Super-Bright-Emitting-Diodes/dp/B00X742KVS/ref=sr_1_43?crd=2UE5G7PA5C3P5&keywords=red+led&qid=1668780890&srefix=red+led%2Caps%2C74&sr=8-43
8. Silver card - https://www.amazon.co.uk/Metallic-Silvered-Activity-Cardstock-Reflective/dp/B0983Q6NSL/ref=sr_1_5?crd=3F64PQSSE6L2F&keywords=silver%2Bcard&qid=1668780960&srefix=silver%2Bcard%2Caps%2C74&sr=8-5&th=1
9. USB cables and plugs x 2
10. Glue and contact cement
11. STL's if you want to print the chassis

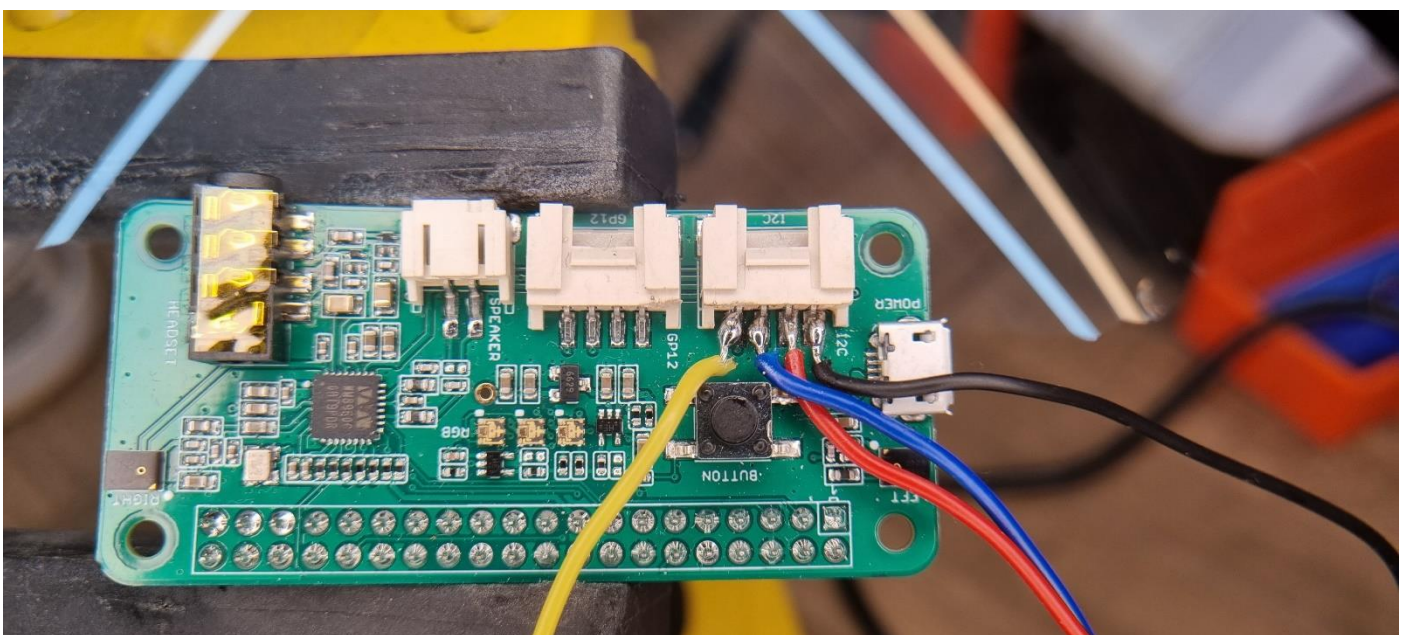
Circuitry

The circuit required for this is very simple. Make sure to follow the pinouts for your thermal printer as set from the manufacturer. Use this link for information about the port expander - <https://learn.adafruit.com/adafruit-mcp23017-i2c-gpio-expander>

Circuit Overview -



I2C Bus taken from the ReSpeaker hat



Accessing the serial port on the Pi when the ReSpeaker hat is plugged in



Serial port, pins bent away from respeaker hat. Connect to the thermal printer

Picovoice

Picovoice is the company who have developed the python speech to text library used in this project. The specific library used is the cheetah library.

Get the required API key at - <https://console.picovoice.ai/profile>

Respeaker set up

Follow the documentation at the link below to set up the respeaker hat on your raspberry pi (you can stop at the Usage Overview section if you wish) –

https://wiki.seeedstudio.com/ReSpeaker_2_Mics_Pi_HAT_Raspberry/

To make the serial port work without sudo or chmod

```
sudo usermod -a -G dialout <username>
```

```
sudo usermod -a -G tty <username>
```

Get your soundcard information from these commands

```
aplay -l
```

```
arecord -l
```

This command will allow you to configure the volume of your speaker

```
alsamixer
```

The first 2 lines in the default section of this file should reflect the card number of the respeaker card number

```
sudo nano /usr/share/alsa/alsa.conf
```

These commands can be used to test your audio settings

```
arecord -d 5 -r 48000 test.wav
```

```
aplay test.wav
```

Install these python libraries for python 3

```
pip3 install pvrecorder
```

```
pip3 install pvcheetah
```

```
pip3 install pvcheetahdemo
```

```
pip3 install adafruit-circuitpython-mcp230xx
```

```
pip3 install adafruit-circuitpython-thermal-printer
```

```
pip3 install Adafruit-Blinka
```

Download the following from github

1. The violation mp3
2. The python script
3. The pv file

Edit the code with your API key, the path to the mp3 on your raspberry pi and the path to the pv file.

Edit the printed message to whatever you would like.