

Exploring HatSpace

<https://sam.pikesley.org>

I glued 100 WS2812 NeoPixels to
a hat then mapped them in 3D
space

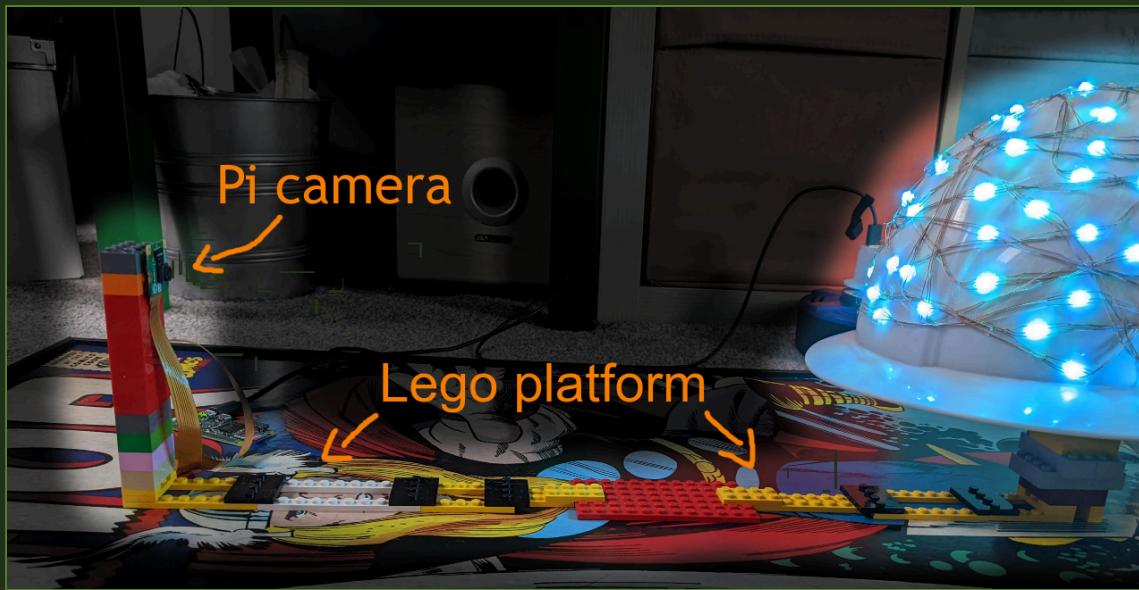
Components

- Hard-hat off eBay
- 2 strings of WS2812 NeoPixels
- Raspberry Pi Zero 2
 - With a button-shim
 - And an Oled display
- USB microphone
 - And a USB-on-the-go adapter
- A power bank
- Wire
- Hot glue

Not a timing device



Mapping the lights



Analysing the photos

{ "x": 623, "y": 260 }

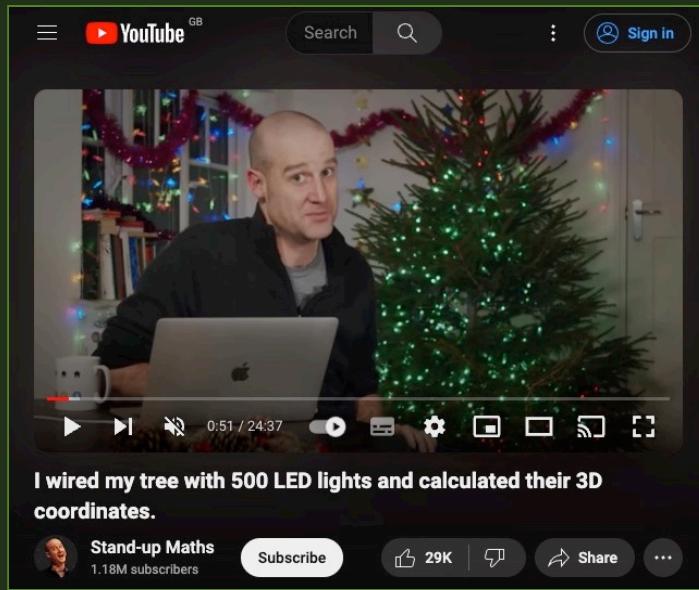
Analysing the photos

```
- index: 0
  x: 1348.0
  y: 999.0
  z: 648.0
- index: 1
  x: 1642.0
  y: 774.5
  z: 833.0
- index: 2
  x: 1629.0
  y: 551.0
  z: 1267.0
```

Pixel metadata

```
{  
  "index": 10,  
  "x": -0.016029593094944512,  
  "y": -0.3249075215782984,  
  "z": 0.5043156596794082,  
  "angles": {  
    "x": 122.79183214885639,  
    "y": 358.1794756662044,  
    "z": 267.17555335782856,  
  },  
}
```

Matt Parker's Christmas tree

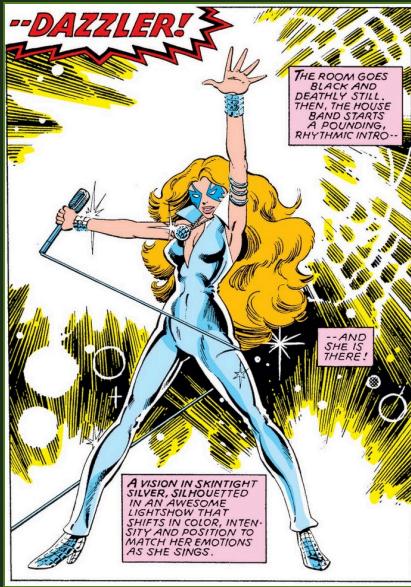


Hue, saturation, value

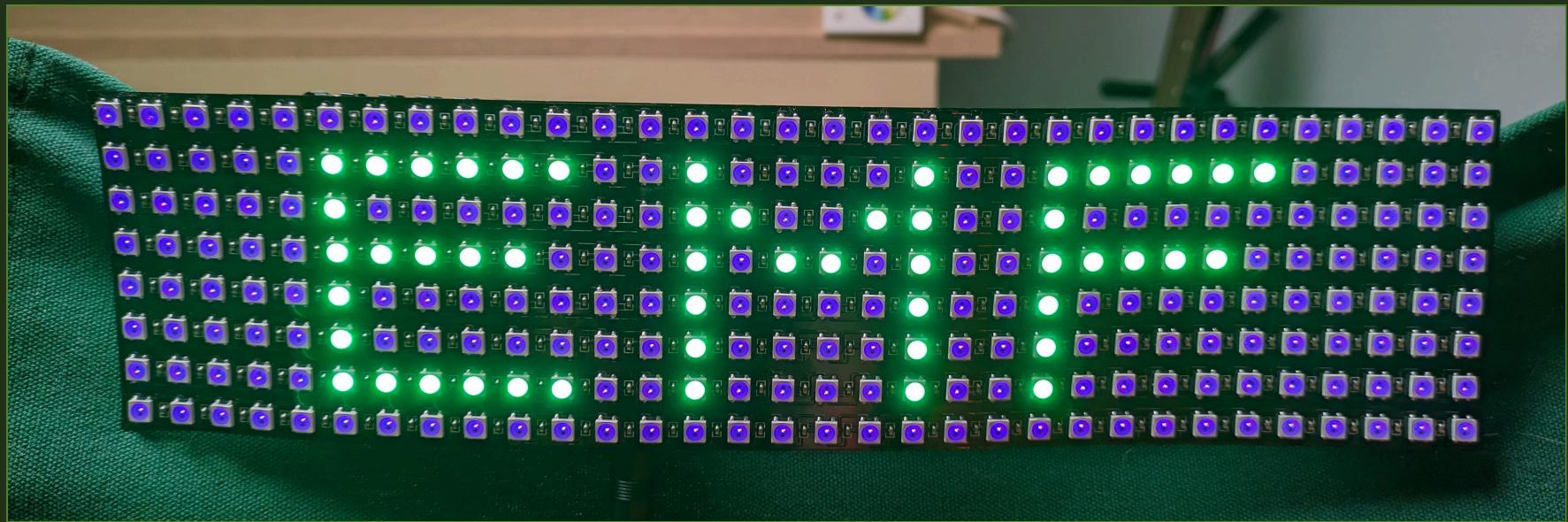
```
>>> import board, neopixel  
>>> lights = neopixel.NeoPixel(board.D21, 100)  
>>> lights[0] = (255, 0, 255)
```

```
{  
    "index": 10,  
    "x": -0.01828410689170183,  
    "y": 0.21729957805907174,  
    "z": 0.7158931082981715,  
    "angles": {  
        "x": 73.11504937908333,  
        "y": 358.53696809142565,  
        "z": 94.80967471203176  
    },  
    "hue": 0.43,  
    "saturation": 1.0,  
    "value": 0.5,  
}
```

Turning sound into light



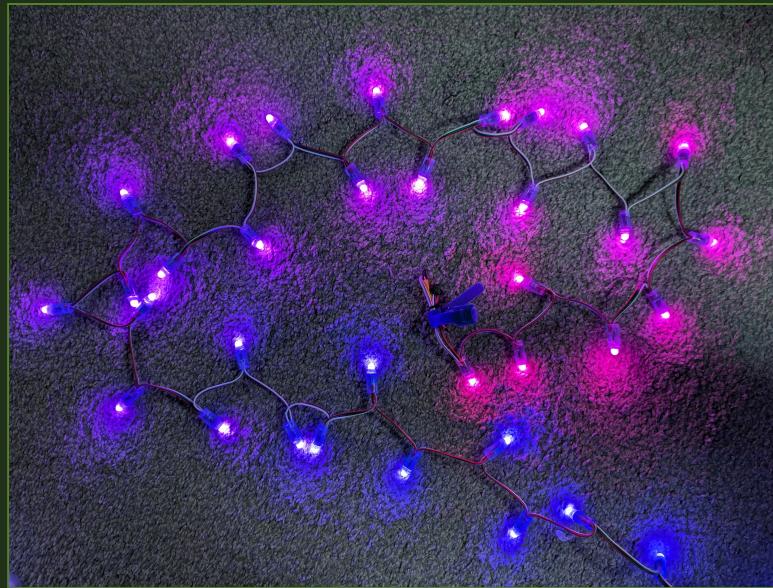
When all you have is a hat...



When all you have is a hat...



When all you have is a hat...



What have
we learned?

Links

- Glowing Hat on pikesley.org
- Matt Parker's Christmas Tree