JavaScript on Microcontrollers

FOSDEM'20

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I am Niels Leenheer

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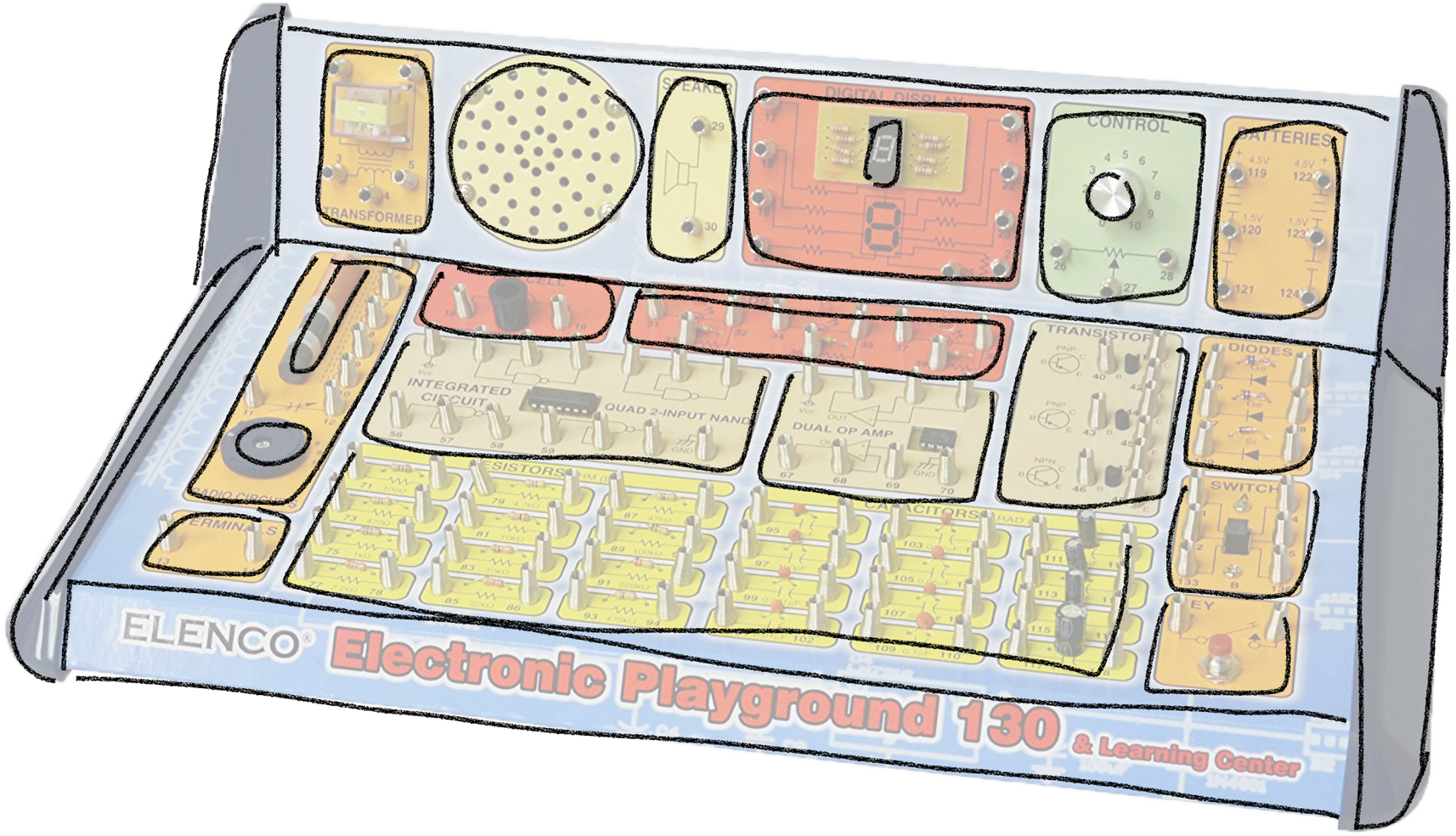
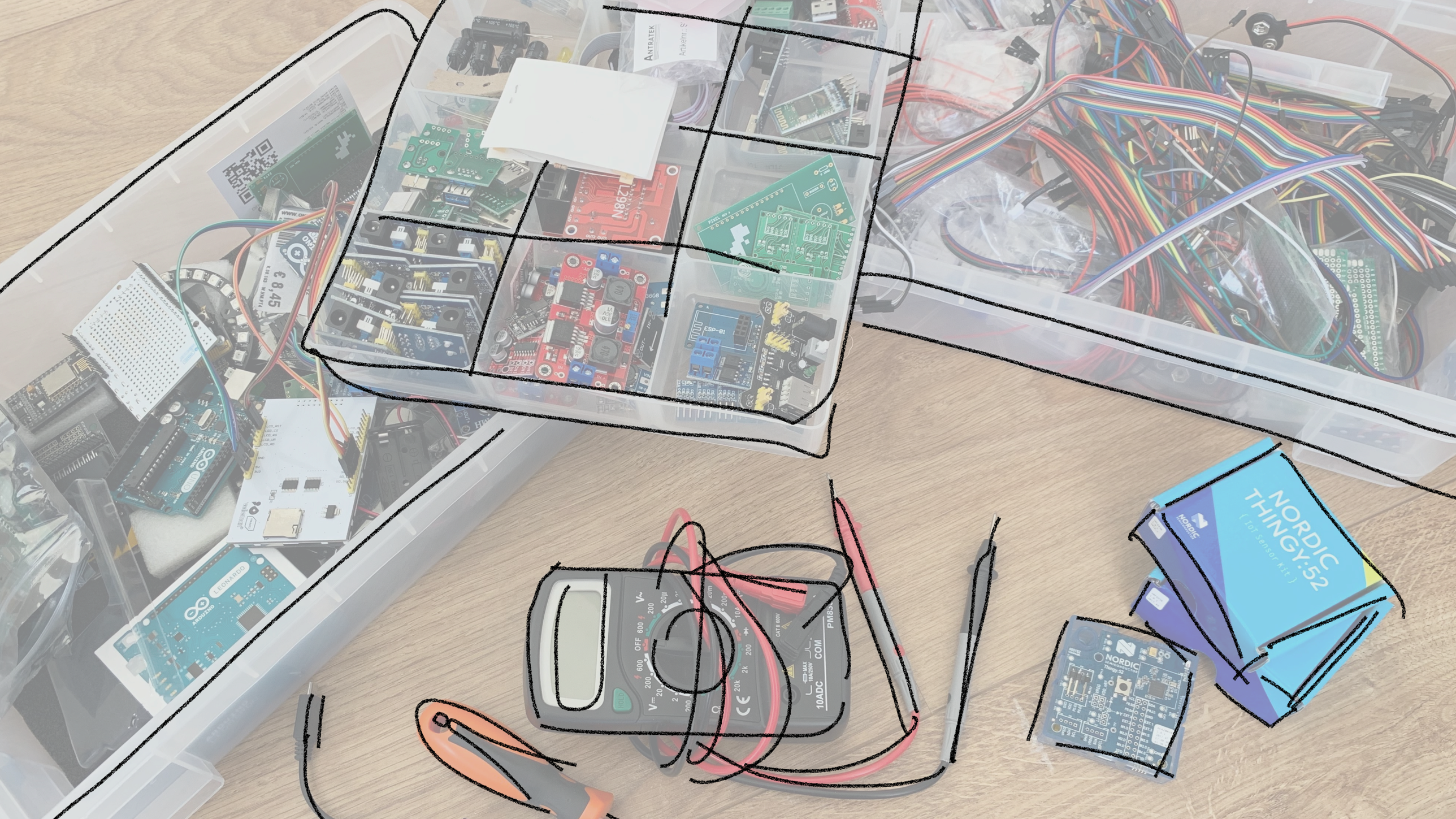
I tweet at @html5test

I electronics


TRANSFORMER
SPEAKER
DIGITAL DISPLAY
CONTROL
BATTERIES
INTEGRATED CIRCUIT
QUAD 2-INPUT NAND
DUAL OP AMP
TRANSISTOR
DIODES
SWITCH
KEY
ELENCO®
Electronic Playground 130
& Learning Center


L298N
ESP-01
ARDUINO
LEONARDO
NORDIC
THINGY:52
(IoT Sensor Kit)
10ADC
COM

JavaScript on Microcontrollers

FOSDEM'20

but . . .

Microcontrollers are slow.

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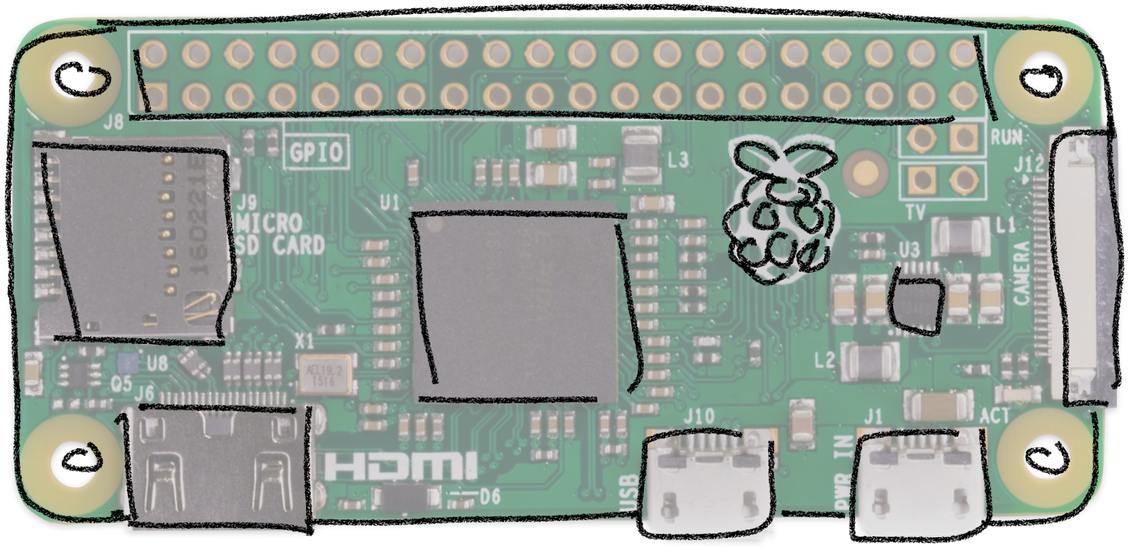
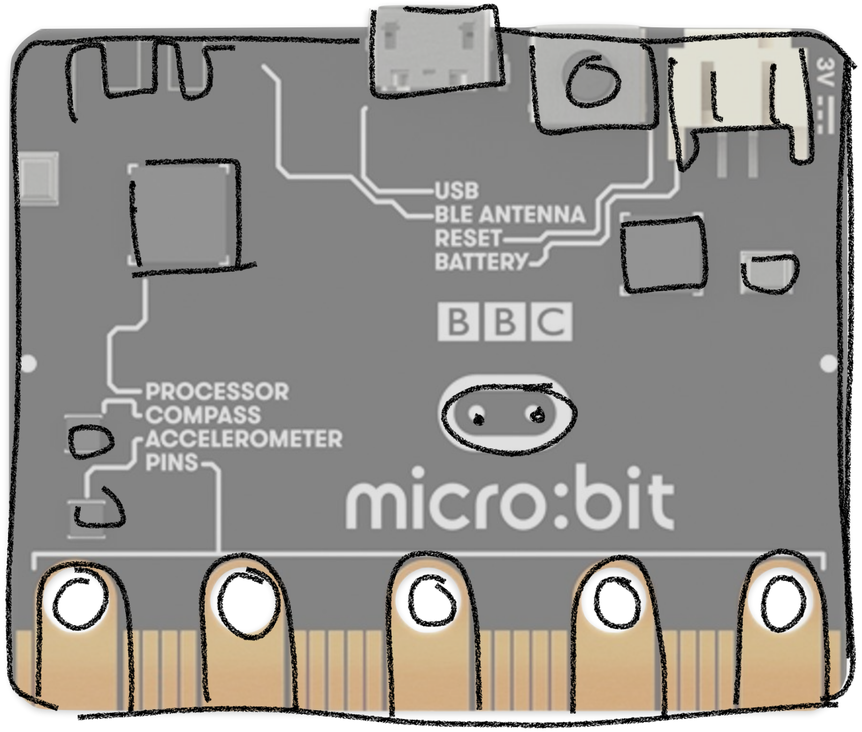


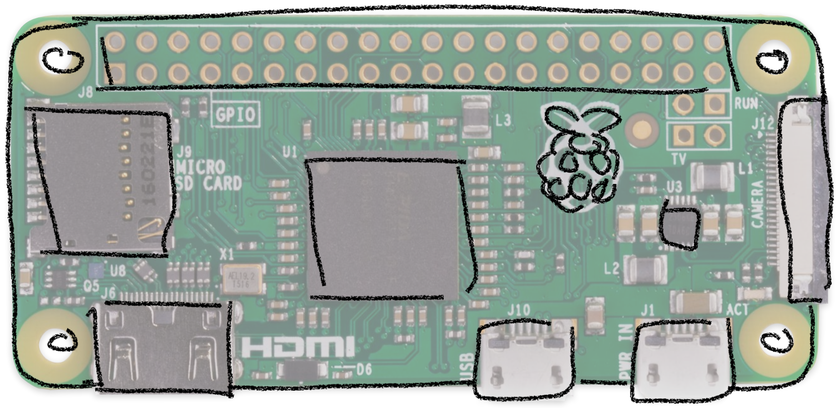
Raspberry Pi Zero W

1 GHz CPU and 512MB RAM

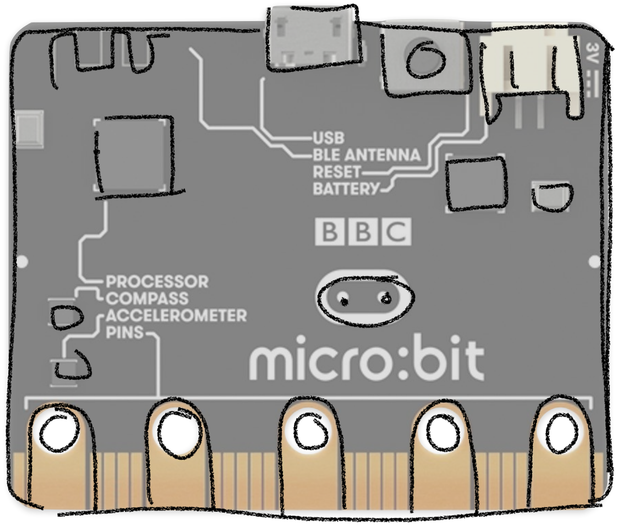


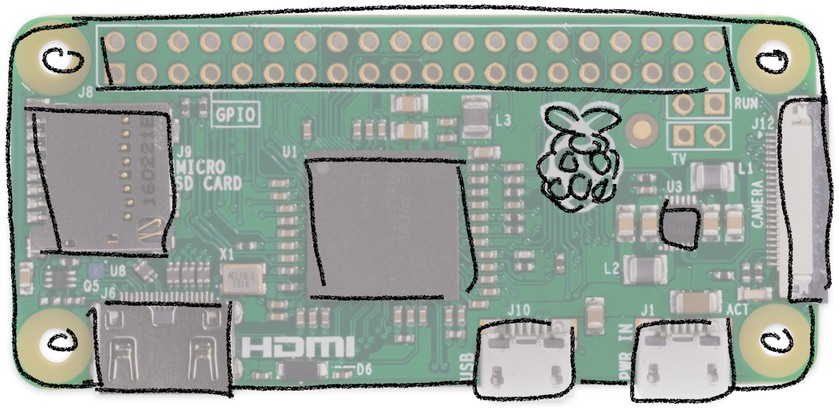
micro:bit

16 MHz CPU and 16KB RAM

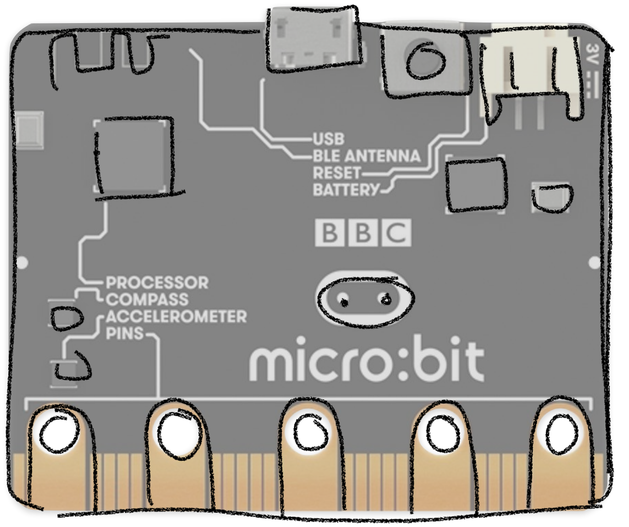

GPIO
RUN
TV
CAMERA
HDMI
DSI
PWR IN
ACT

60 x faster


USB
BLE ANTENNA
RESET
BATTERY
BBC
PROCESSOR
COMPASS
ACCELEROMETER
PINS
micro:bit
3V



30.000 x memory



Microcontrollers are very power efficient.

Microcontrollers are very power efficient.

Microcontrollers only need to be fast enough to solve the problem.

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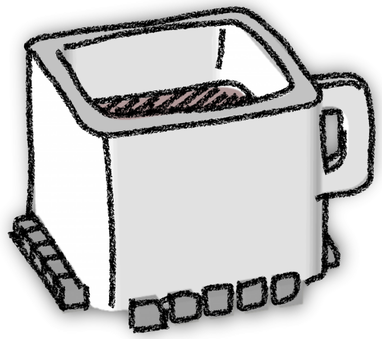
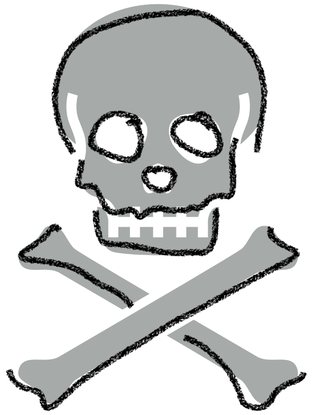
how ?



Espruino

Espruino is a JavaScript interpreter for microcontrollers.

demo

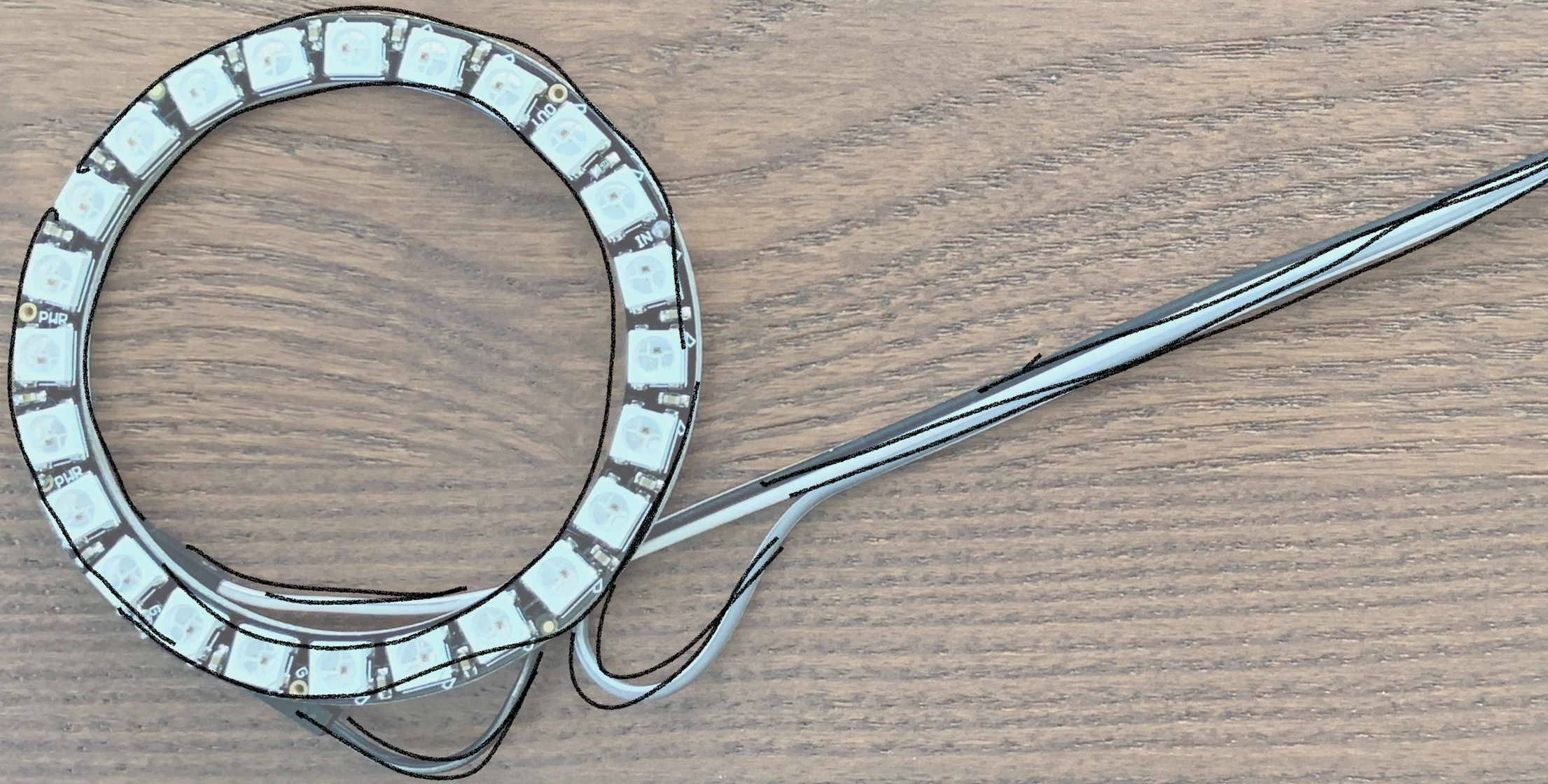


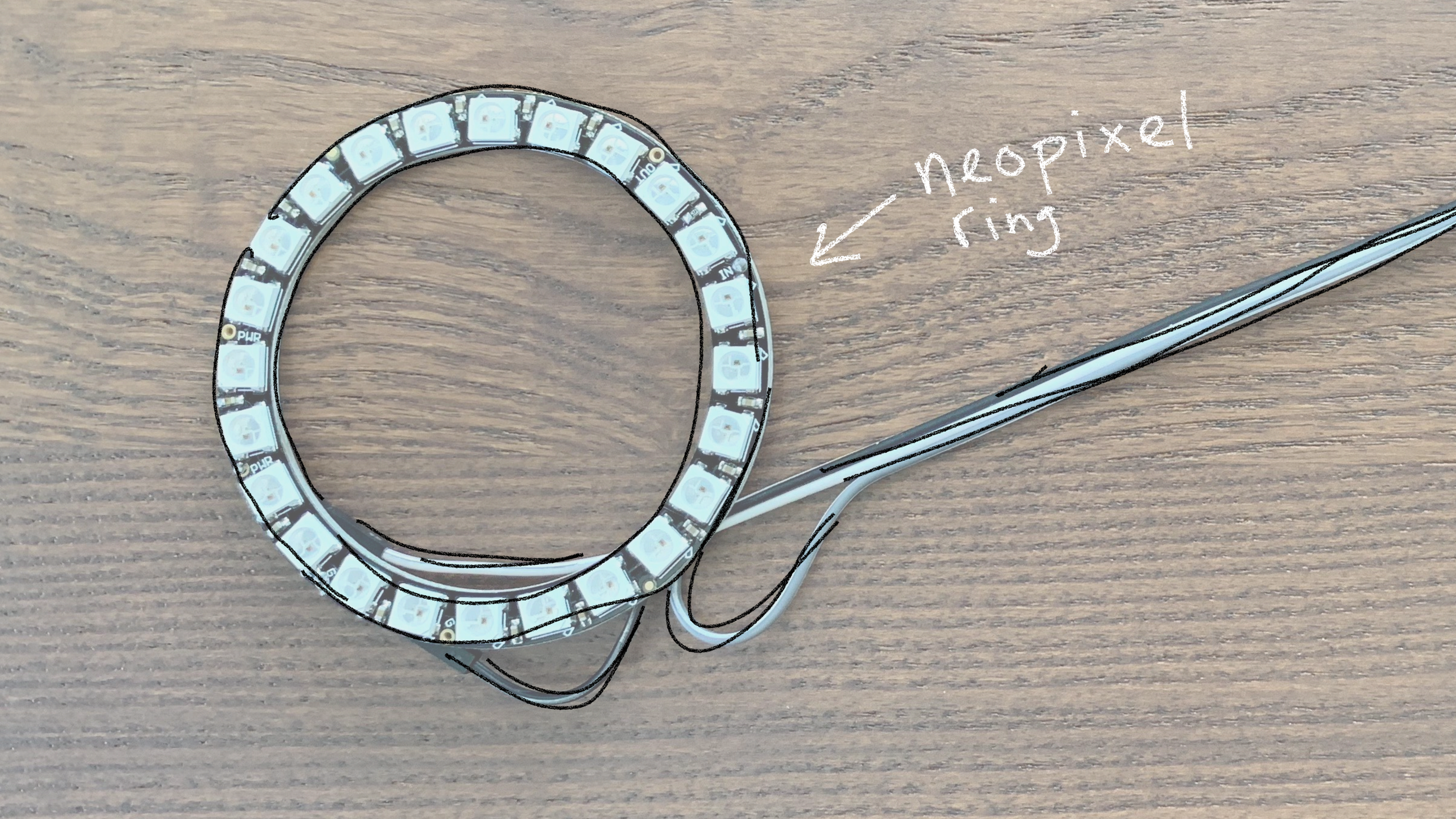
Experimental technology

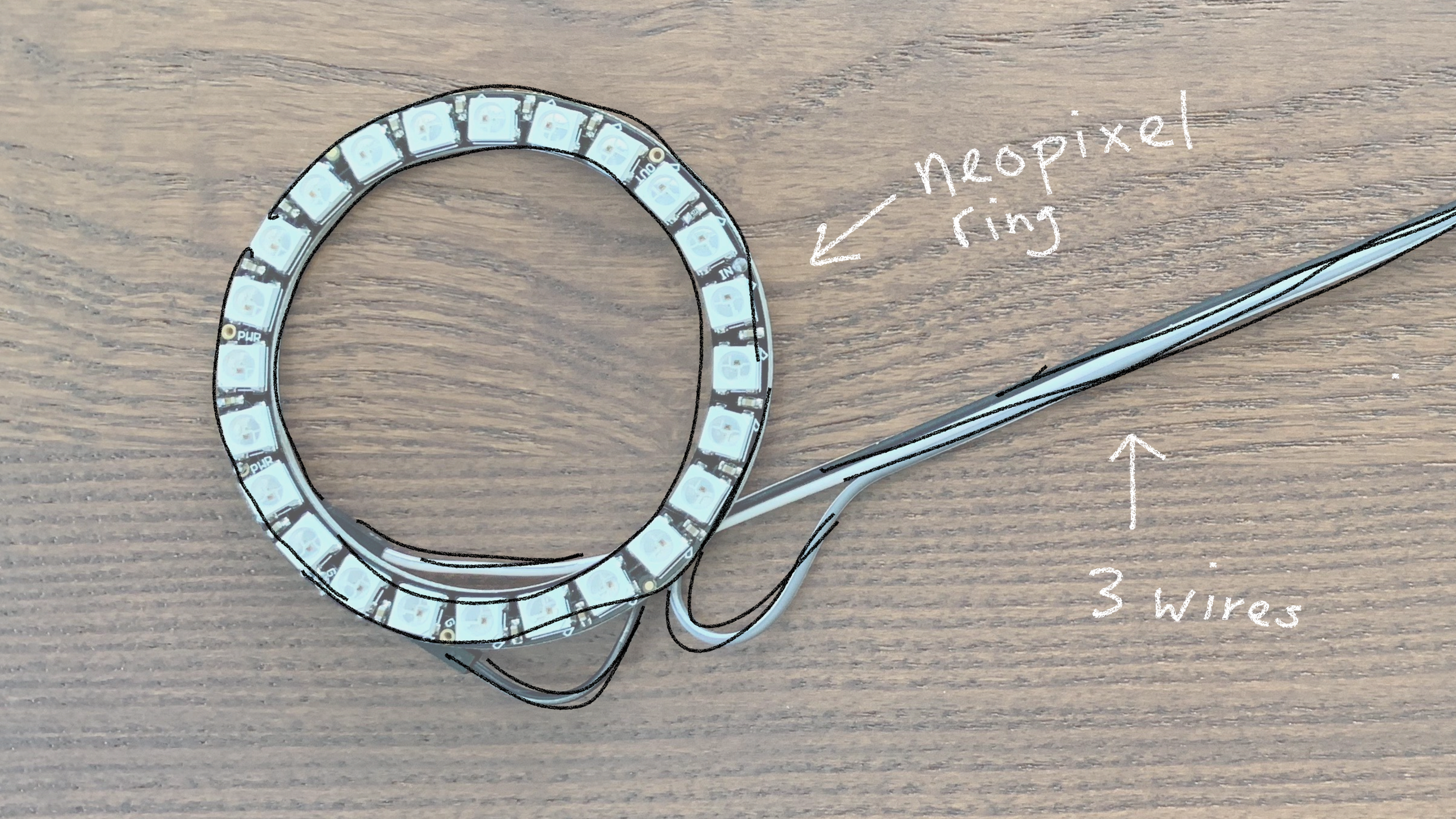
Setting low expectations

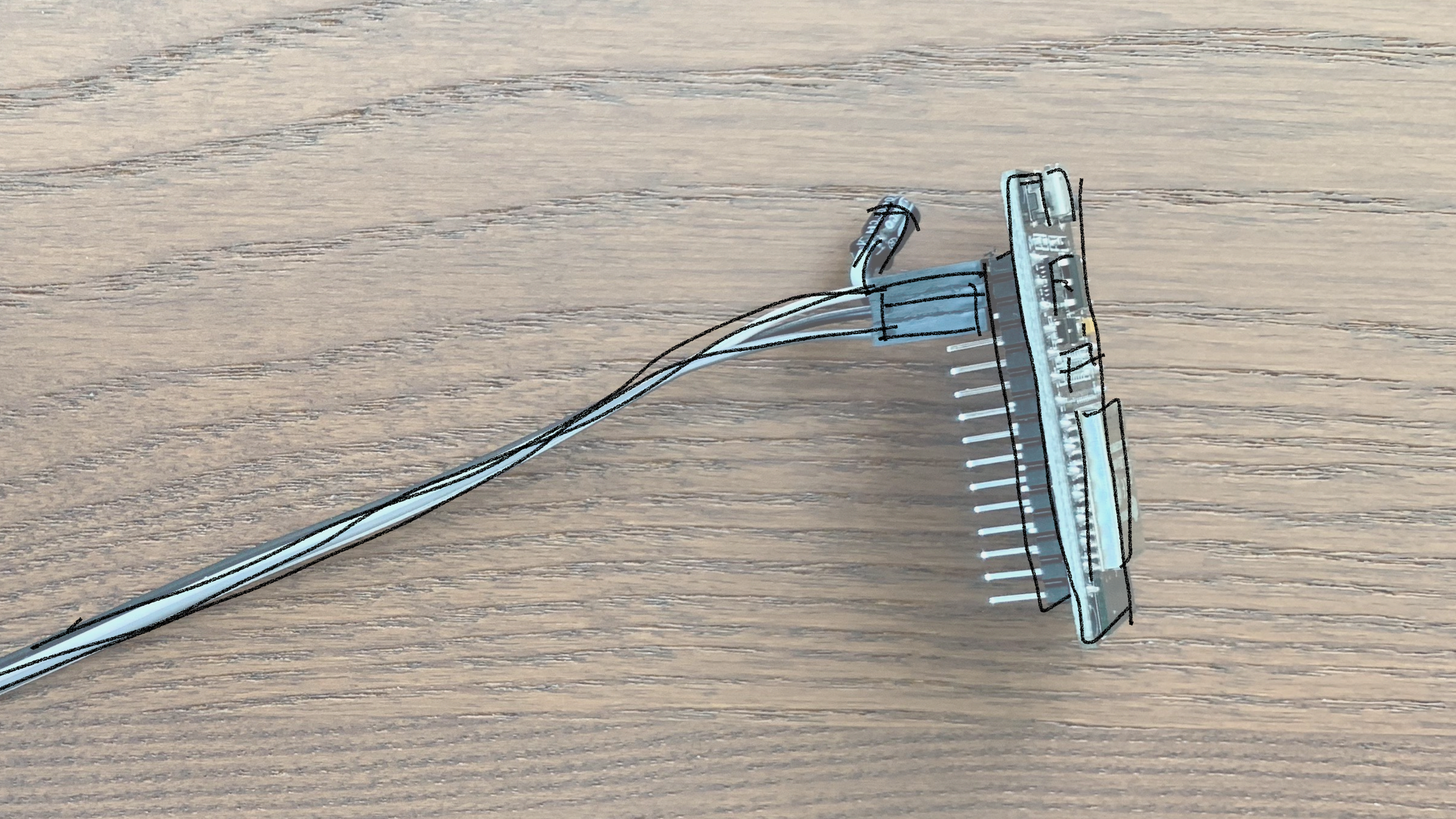
#1

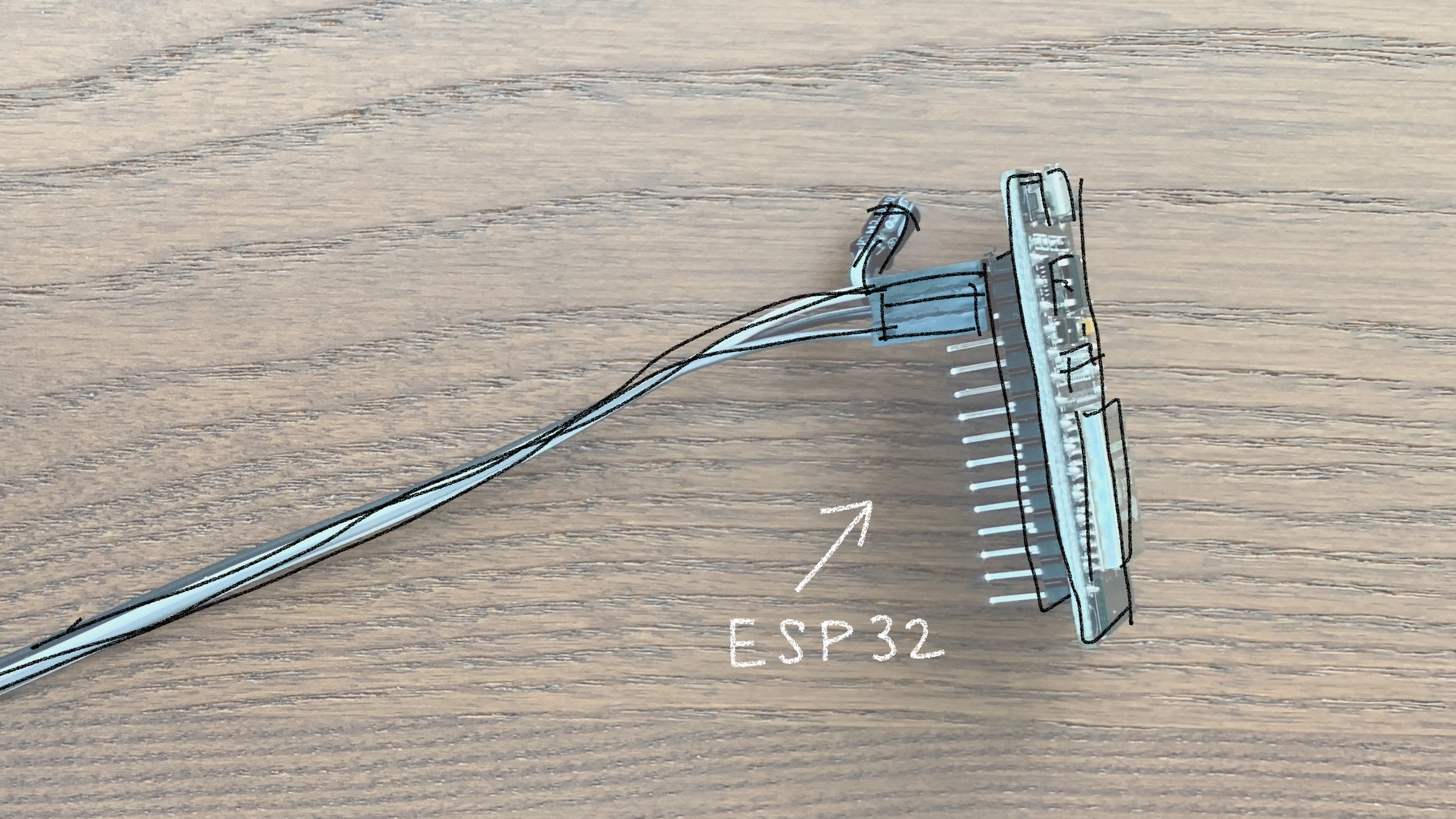
Connected lightbulb


OUT
IN
PWR
PWR


neopixel
ring
PWR
PWR
IN
OUT

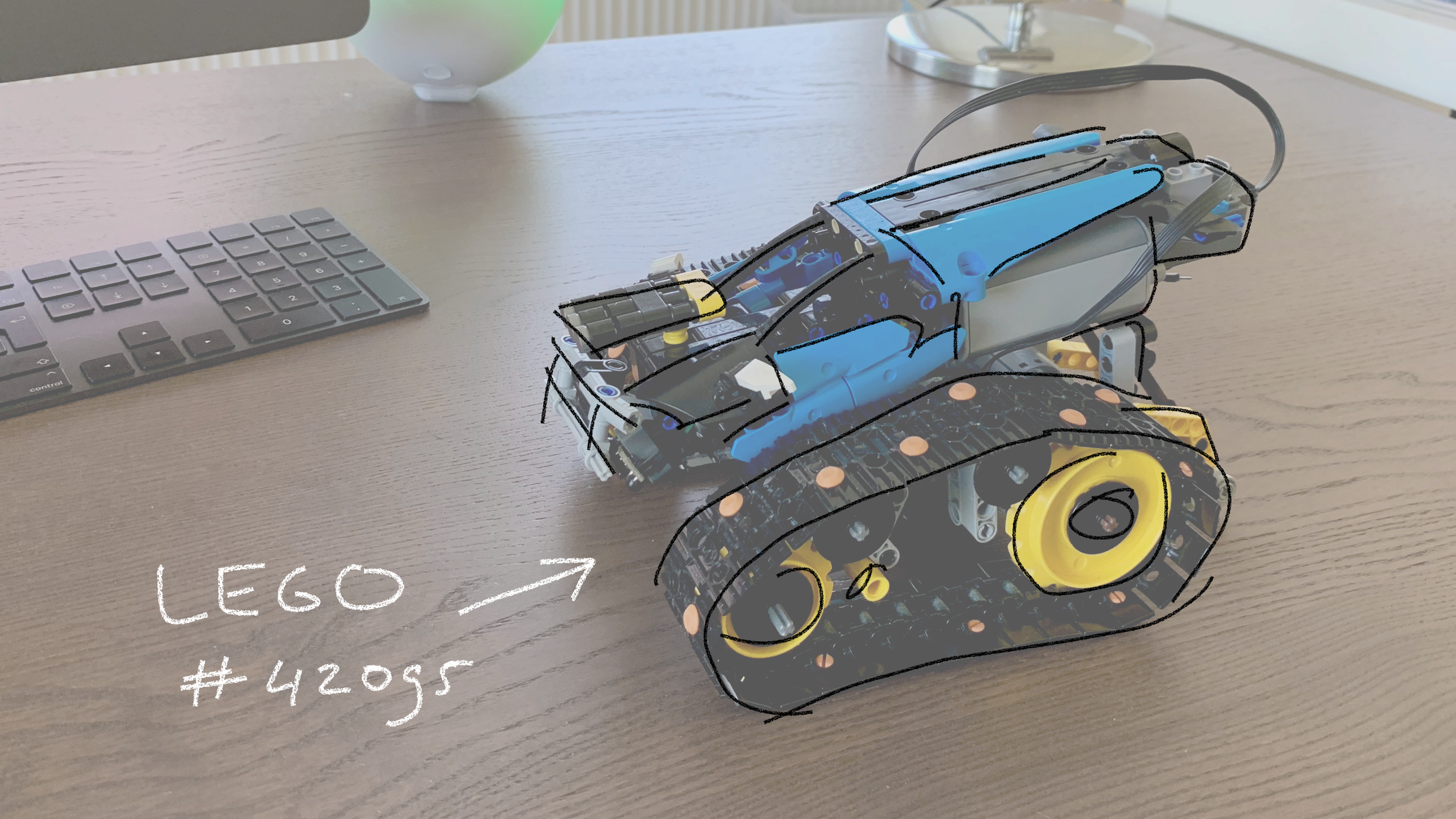

neopixel ring
3 wires

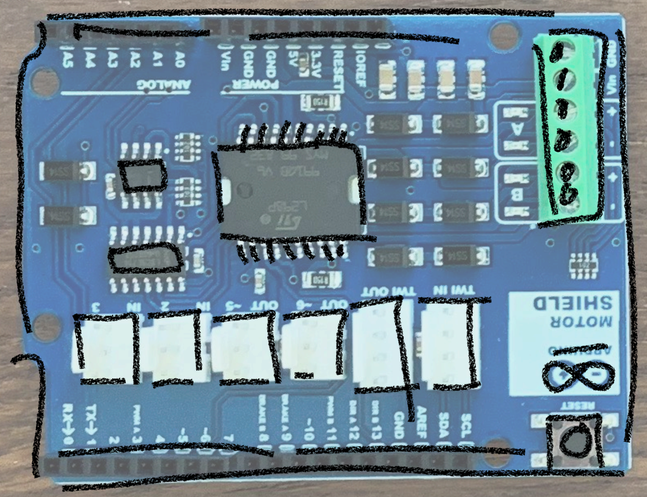


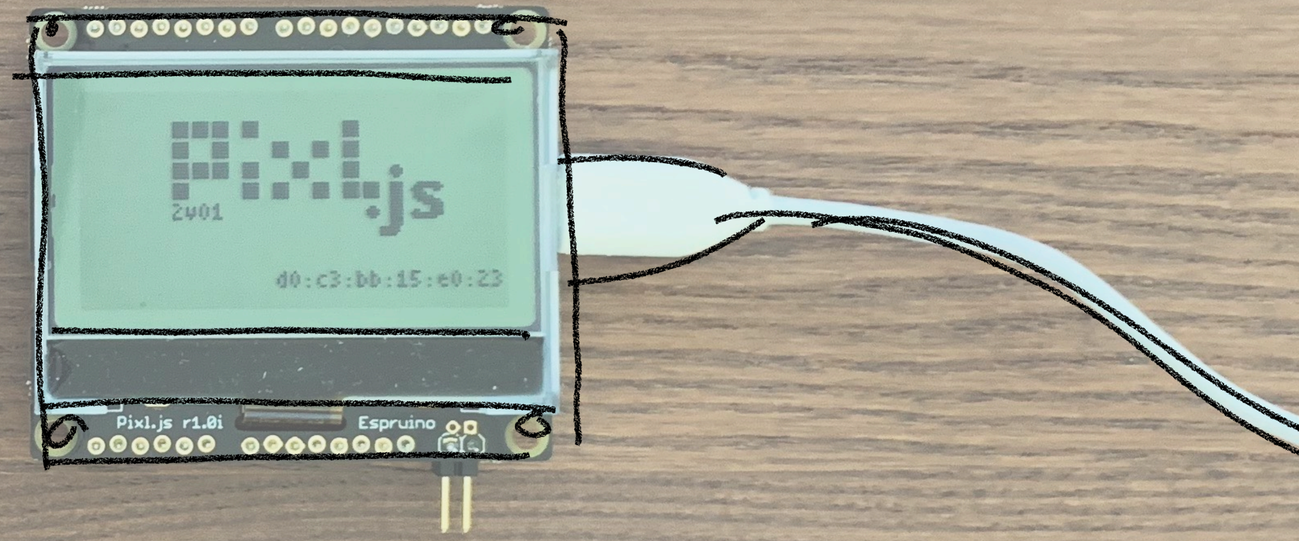

ESP32

#2

Remote controlled car


LEGO
#42095

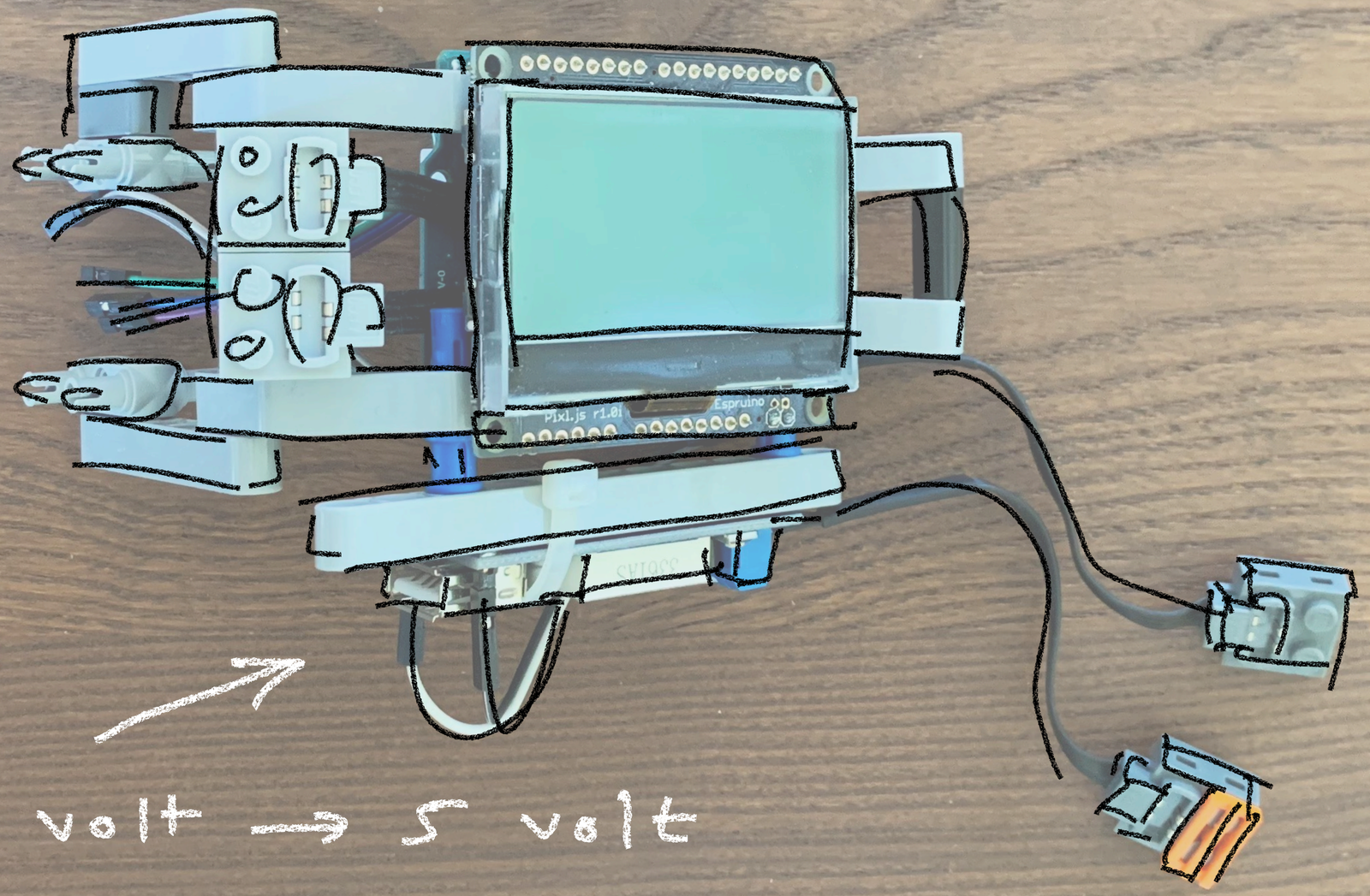




↑

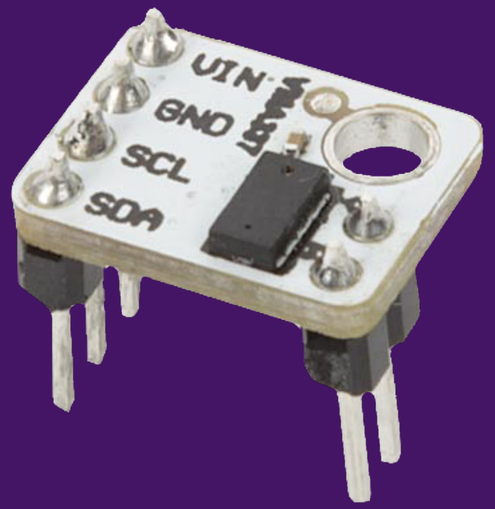
Arduino Motorshield V3

Pixl.js
2v01
d0:c3:bb:15:e0:23
Pixl.js r1.0i
Espruino


Pixl.js r1.0i
Espruino
9 volt → 5 volt

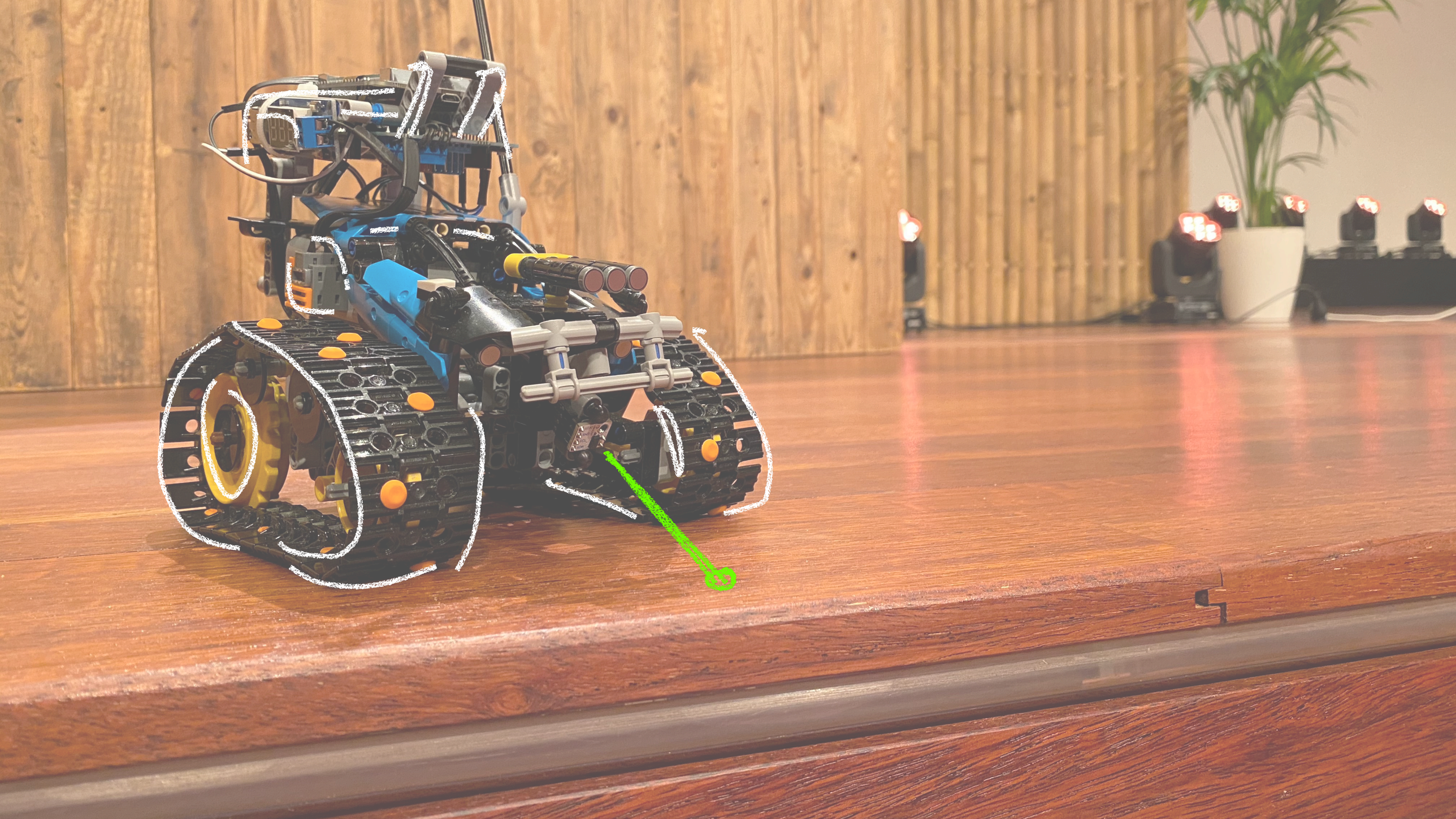
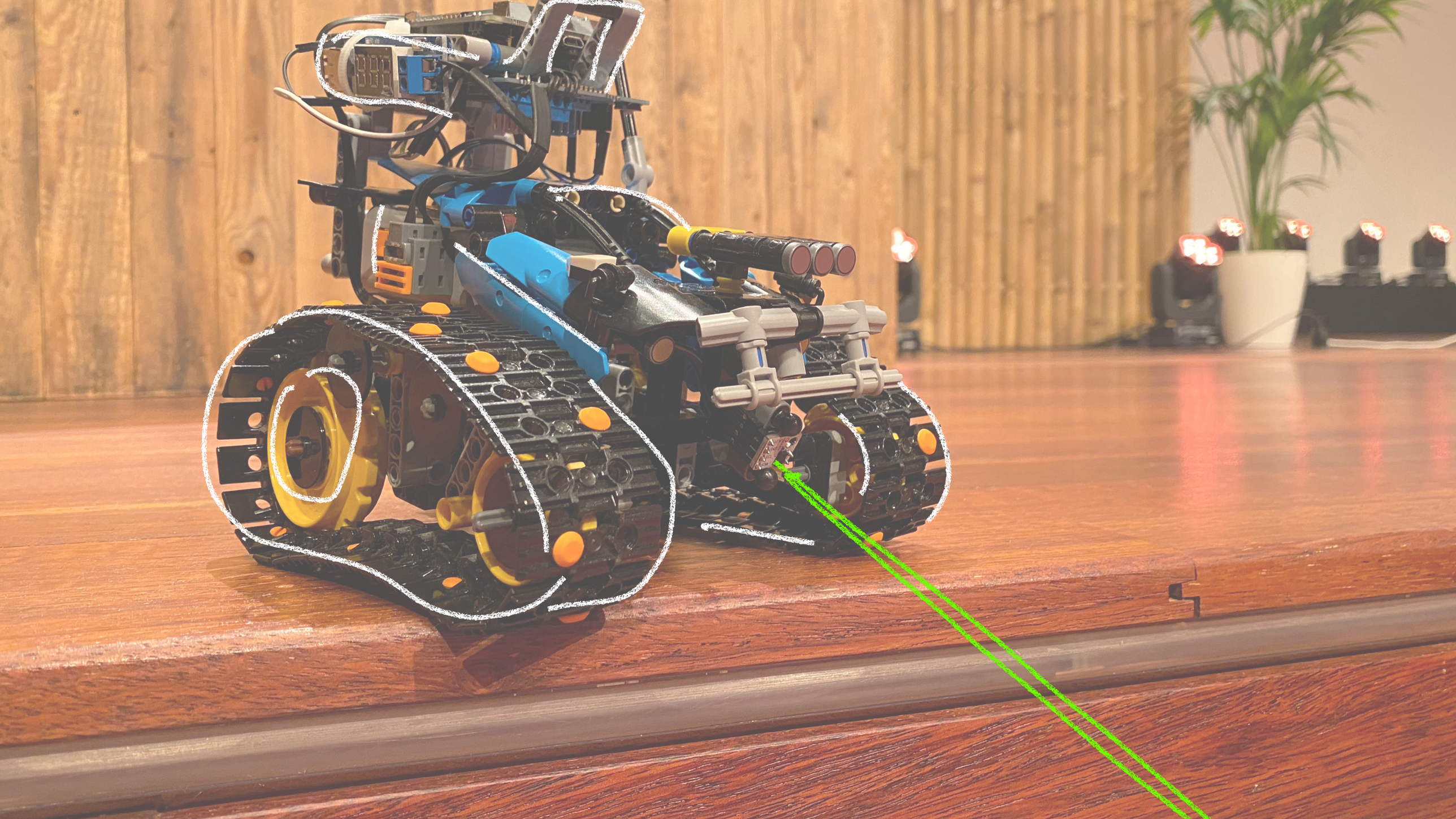
Pixl.js
2v02
c9:06:6b:07:03:7b
Pixl.js r1.0i
Espruino

Lasers!



Invisible

Lasers!

tiny
Invisible

Lasers!