INTERACTIVE LIGHT UP BOOTS TUTORIAL

Tutorial by Chanelle Francis & Maria Kudriavtceva

PROJECT OVERVIEW

- For this project you can create **Interactive Light up Boots** based on our instructions.
- Interaction is through contact with the foot and the conductive material lined in the heel of the boot.
- The main concept is that the boots light up simply through wearing the boots.
- The light on the bottom of the shoes is projected with NeoPixel LED Strips.
- The lights are activated by velostat conductive material that is cut to the shape of the heel.

SIMPLE. INTERACTIVE. LUMINOUS.

BUILDING PROCESS

BUILDING PROCESS

TOOLS & SUPPLIES YOU NEED:

- 2 x Adafruit Feather 32u4 Bluefruit LE
- 1 x Arduino Microprocessor
- 1 x Roll of Velostat (conductive material)
- 1 x NeoPixel 60-LED Strip (cutted on 2 pieces)
- 2 x Battery Holder with Switch
- 1 x Spool of Conductive thread
- Small Alligator Clips Test Lead (set of 4)
- 1 x Pair of Boots
- 6 x Silicone coated stranded wire
- 1 x Super Glue
- Soldering Iron

NEOPIXELS TESTING

Let's start with the first step!

NEOPIXELS TESTING:

- First of all, you need to test NeoPixels connected to Bluefruit microprocessor and run a Strand Test provided by Bluefruit library which you can install according to the steps in tutorial on learn.adafruit.com/adafruit-feather-32u4-bluefruit-le/overview .
- Once you'll get it to work you can continue to go to the next steps.
- Code snippets are on the next slide.

BUILDING PROCESS

Sensor_test_shoes §

```
#include <Adafruit_NeoPixel.h>



const int analogInPin = A2;  // Analog input pin that the potentiometer is attached to
Adafruit_NeoPixel strip = Adafruit_NeoPixel(10, 6, NEO_GRB + NEO_KHZ800);
int sensorValue = 0;        // value read from the pot

void setup() {
  // initialize serial communications at 9600 bps:
  Serial.begin(9600);
 pinMode(6, INPUT_PULLUP);
   strip.begin();
  strip.show(); // Initialize all pixels to 'off'

}

void loop() {
  // read the analog in value:
  sensorValue = analogRead(analogInPin);
  // print the results to the serial monitor:
  Serial.print("sensor = " );
  Serial.println(sensorValue);
```

BUILDING PROCESS

Sensor_test_shoes §

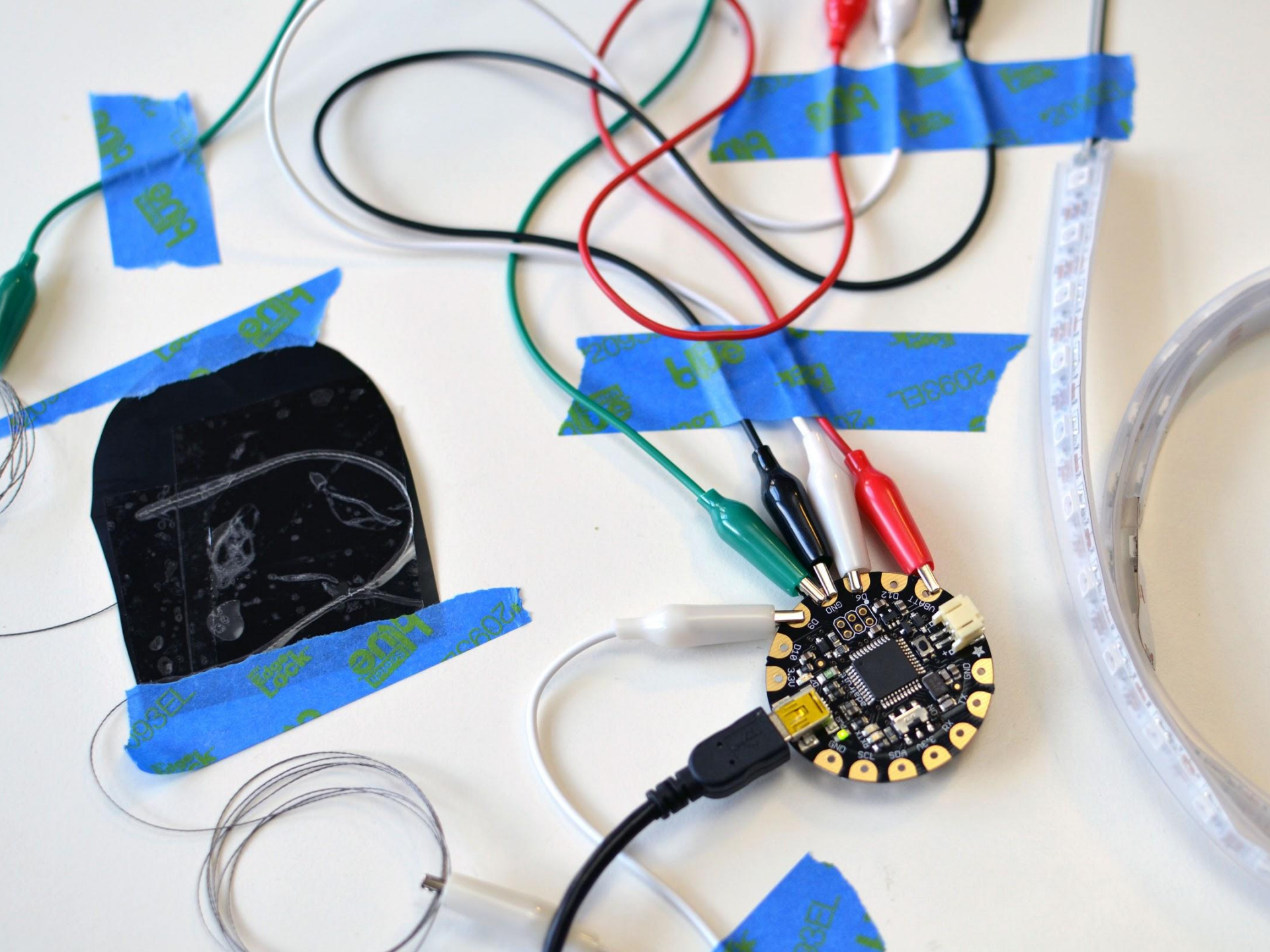
```
}

void loop() {
  // read the analog in value:
  sensorValue = analogRead(analogInPin);
  // print the results to the serial monitor:
  Serial.print("sensor = " );
  Serial.println(sensorValue);

if (sensorValue >10){
  Serial.println("leds triggered");
colorWipe(strip.Color(0, 255, 255), 25);
colorWipe(strip.Color(0, 0, 0), 25);
}

}

void colorWipe(uint32_t c, uint8_t wait) {
  for(uint16_t i=0; i<strip.numPixels(); i++) {
      strip.setPixelColor(i, c);
      strip.show();
      delay(wait);
  }
}
```




RUNNING A STRAND TEST

MAKE A VELOSTAT STEP SENSOR

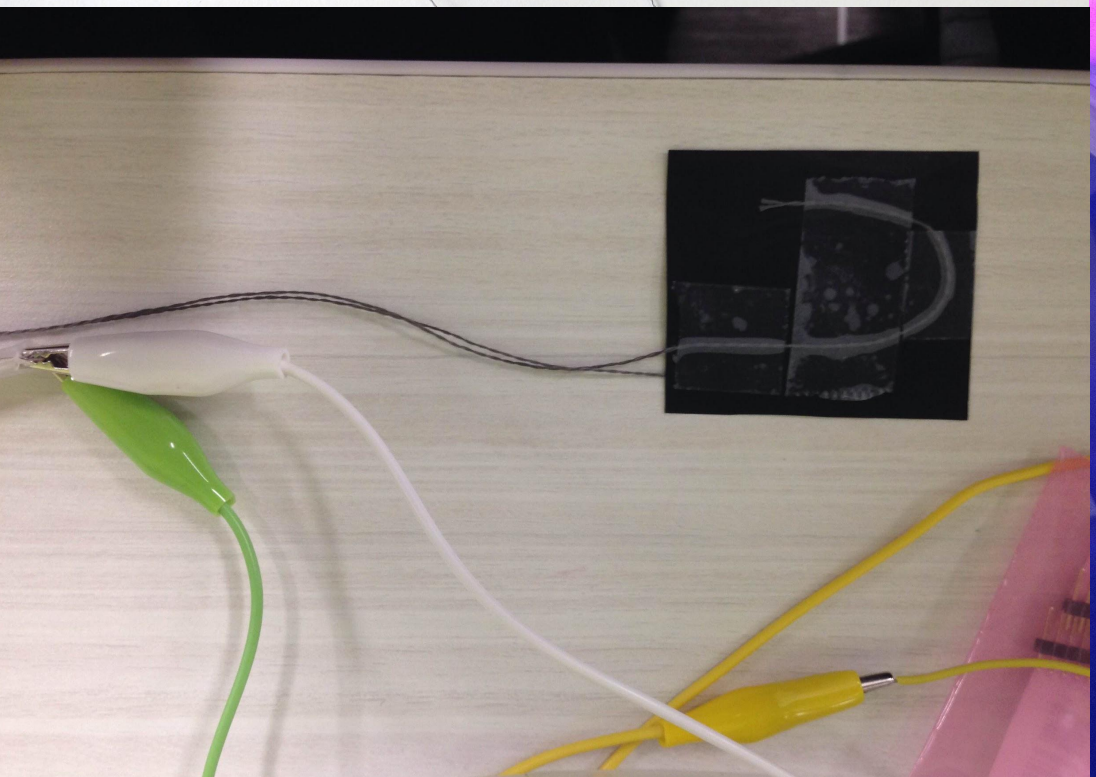
Second step...

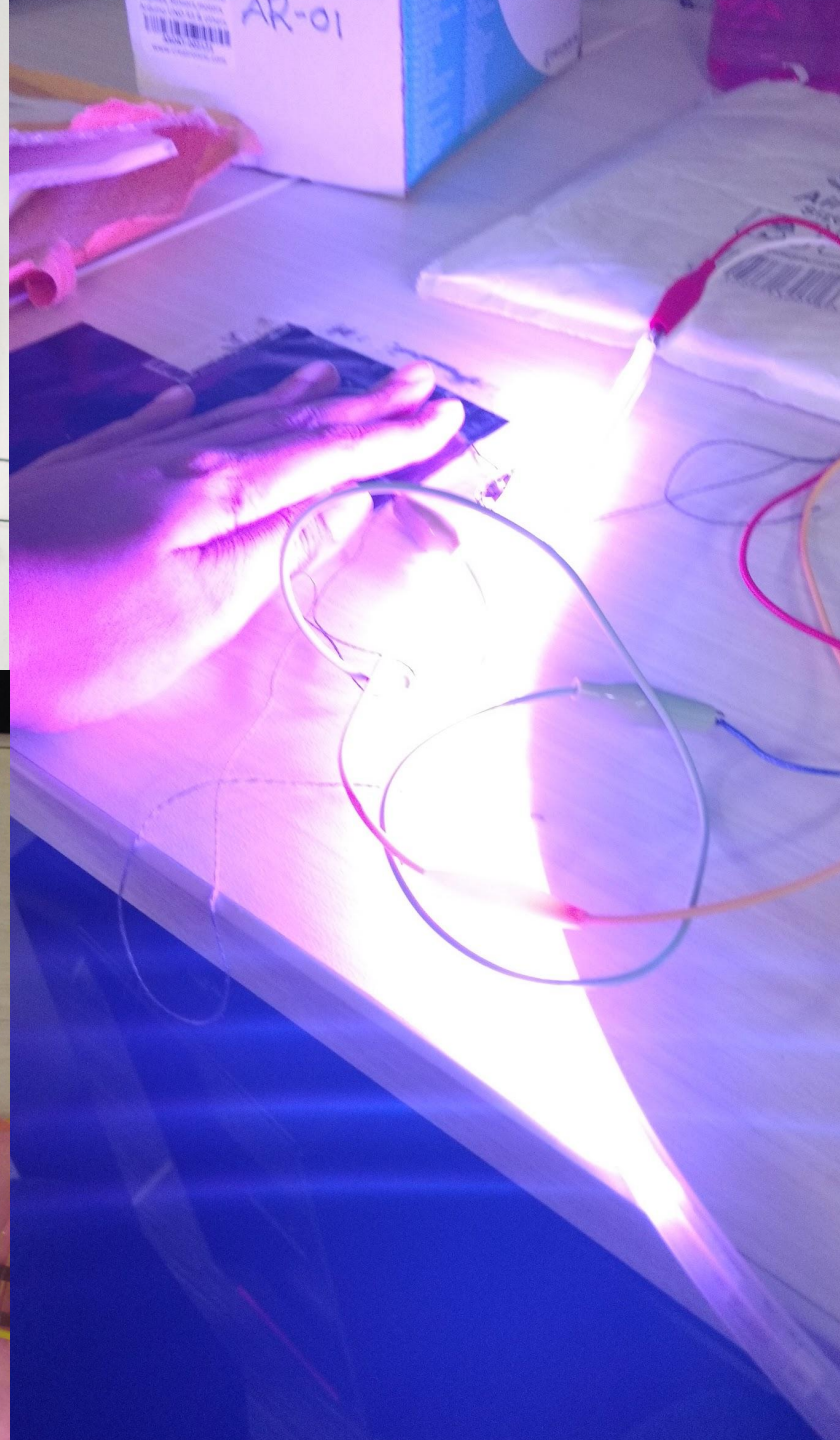
BUILDING PROCESS

MAKE A VELOSTAT STEP SENSOR:

- Cut the velostat conductive material to the shape of the heel.
- Then stick out a loop of conductive thread with a long (at least 18 inches) tail out to one side, tape it to the velostat and weave through the Bluefruit microprocessor.

MAKE A VELOSTAT STEP SENSOR





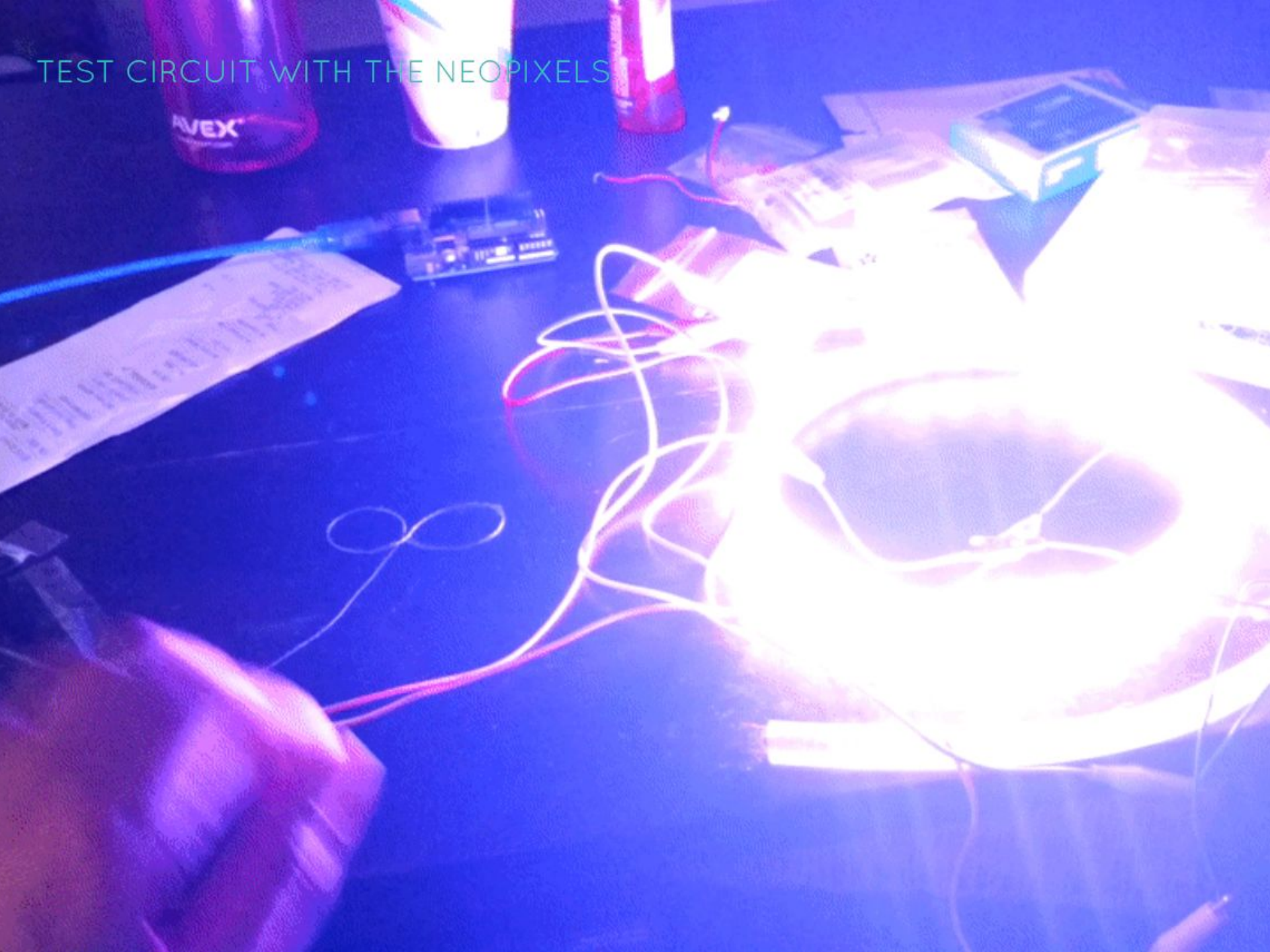
TEST CIRCUIT WITH THE NEOPIXELS

Lighting up!

TEST CIRCUIT WITH THE NEOPIXELS:

- Before you attach the Bluefruit microprocessor to the boots make tests with the NeoPixel strips to ensure that the circuits are working correctly.

TEST CIRCUIT WITH THE NEOPIXELS



ATTACH VELOSTAT SENSOR TO SHOES

Almost done...

BUILDING PROCESS

ATTACH VELOSTAT SENSOR TO SHOES:

- Place the velostat sensor to the bottom of the shoe.
- Pierce the needle with the velostat sensor thread through the side of the shoe, keeping the two threads a short distance from each other.
- Position your velostat underneath the shoe's insole.
- After that test sensors.


ATTACH VELOSTAT SENSOR TO SHOES & TEST

ATTACH NEOPIXEL LED STRIP TO SHOES

The most exciting moment! :)

BUILDING PROCESS

ATTACH NEOPIXEL LED STRIP TO SHOES:

- Then attach the Bluefruit microprocessors to the boots with conductive thread.
- Glue the NeoPixel strip along the bottom of the shoe and cut it to the length needed.
- Attach the alligator clips to the NeoPixel strip that attaches to the Bluefruit microprocessor.
- Solder the wires to the microprocessor.

BUILDING PROCESS

Sensor_test_shoes §

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BUILDING PROCESS

Sensor_test_shoes §

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}

void loop() {
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  sensorValue = analogRead(analogInPin);
  // print the results to the serial monitor:
  Serial.print("sensor = " );
  Serial.println(sensorValue);

if (sensorValue >30){
  Serial.println("leds triggered");
colorWipe(strip.Color(0, 255, 255), 25);
colorWipe(strip.Color(0, 0, 0), 25);
}

}

void colorWipe(uint32_t c, uint8_t wait) {
  for(uint16_t i=0; i<strip.numPixels(); i++) {
      strip.setPixelColor(i, c);
      strip.show();
      delay(wait);
  }
```

- Fly and Shine.

GOOD LUCK BUILDING!

Hope you like it :)