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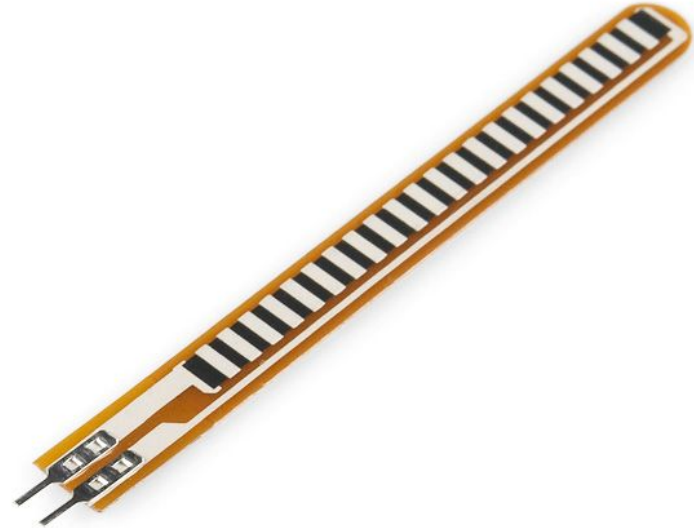
# The Torchbearer

By Russell Poag, Christian Pack  
and Joshua Kupras

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# Tool Incorporated - Flex Sensor

- The **flex sensor** is a resistor in which the amount of resistance increases as the sensor is bent to a greater degree.
- Useful when varying amounts of electricity need to be used for different positions of a machine
- Examples include:
  - automatic door mechanisms
  - human movement tracking

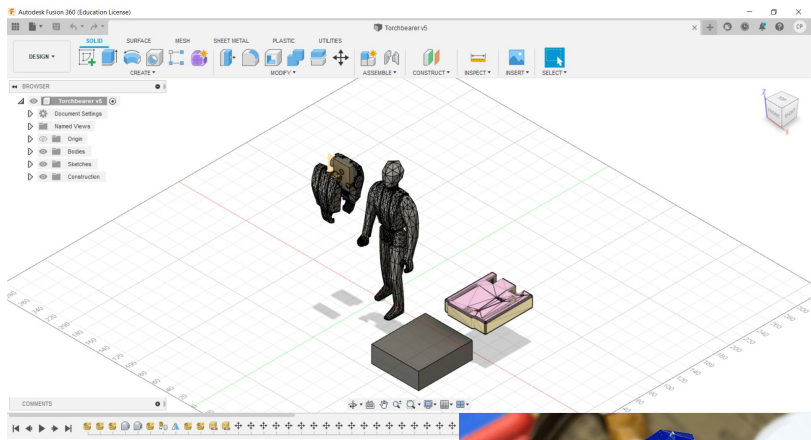


# Basic Functioning

1. Button is pressed which triggers the servo to raise the torch bearer's arm.
2. Once the arm is raised and the flex sensor is bent, the lights in his hand begin to turn on as they receive current.
3. When the button is pressed again, the Torch Bearer lowers his arm and the lights turn off as the flex sensor returns to its original bent state.

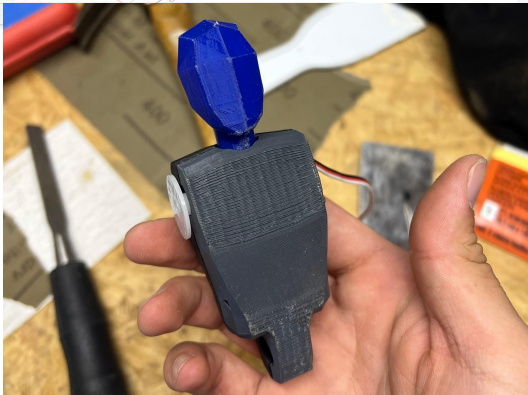


# Computer-Aided-Drafting & Printing



CAD Designed a figurine with a section cut out of torso for Servo placement.

Sanding and Fine  
Tuning  
(White Disc is attached  
to internal Servo)



3DPrinterOS - History

3DPrinterOS.com/dashboard

Drive, Camera, Gmail, Calendar, Google, myJUTK, Outlook, GroupMe, WebAssign, FT152, MATH100, PH2144, MATH241, ME 202, UTK, RESEARCH, FALL 2019, Tools

MePrinters

Select date rangeSearch by Printer, user, job

1.2Hours Printed

1Prints

0Printing

5In queue

0Errors

0.01Materials used (kg)

left arm v1.8237603

googlePRUSA\_0\_MK3

01:05h10.83grecently by me

P5 ICS

leftLeg v1.823...8238009

googlePRUSA\_0\_MK3

01:05h11.64g2m ago by me

P5 ICS

right arm(torch...8237602

googlePRUSA\_0\_MK3

01:03h10.14g4m ago by me

P5 ICS

rightLeg v1.82...8237819

googlePRUSA\_0\_MK3

01:05h11.58g7m ago by me

P5 ICS

chest torchbear...8237594

googlePRUSA\_0\_MK3

01:27h14.36g10m ago by me

P5 ICS

back torchbear...8204389

googlePRUSA\_0\_MK3

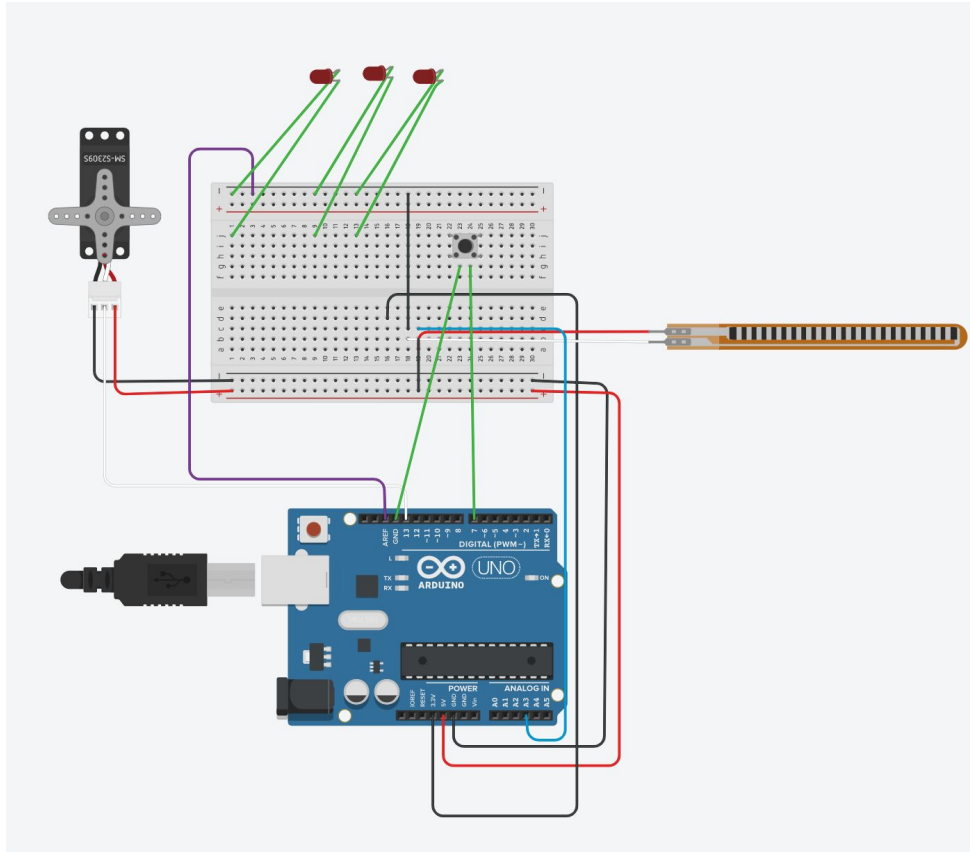
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P3 ICS

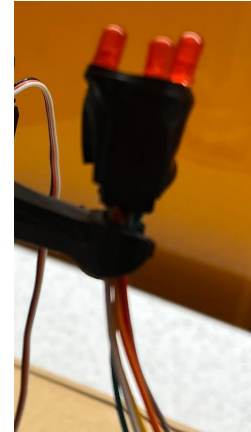
3DPrinterOS 2022All rights reservedTerms and ConditionsPrivacy PolicyData HandlingGDPR

Chat

# Circuit



Simple Circuit Layout of  
our project.  
LED's were routed to  
the torchbearer's hand.



# Coding

- Lights turn on/off in a pattern
  - Maintains a list of pins to be held HIGH or LOW
  - Waits a while, and switches pin to be held on
  - Can be extended to any number of lights
- Arm raises up when button is pressed
  - Initiates Servo
  - Boolean value switched when button is pressed
- Flex sensor value is read to determine when arm is up
  - When resistance is above a certain value, it turns the light sequence on

```
void loop() {  
  //Read value and change light  
  flexValue = analogRead(flexPin);  
  flexValue = map(flexValue, 400, 1000, 0, 255);  
  flexValue = constrain(flexValue, 0, 255);  
  Serial.println(flexValue);  
  if (flexValue<180){  
    LEDSon=true;  
  } else{  
    LEDSon=false;  
  }  
  
  if (LEDSon){  
    digitalWrite(lightPins[lightIndex], LOW);  
    delay(lightTime);  
    digitalWrite(lightPins[lightIndex], HIGH);  
    lightIndex++;  
  
    if (lightIndex>=sizeof( lightPins)){  
      lightIndex=0;  
    }  
  } else{  
  
    digitalWrite(lightPins[0], HIGH);  
    digitalWrite(lightPins[1], HIGH);  
    digitalWrite(lightPins[2], HIGH);  
  }  
  
  // Read button and change bool if pushed  
  if(digitalRead(BUTTON_PIN) == LOW) {  
    up=!up;  
    Serial.print("Push");  
  }  
  
  // Raise arm if bool is up  
  if (up){  
    raiseArm();  
  } else{  
    lowerArm();  
  }  
}
```



# Pictures

