I / III

Neopixel Lightsaber

Using Arduino

Basics

- Uses individually addressable LED Strips
  - This helps with the effects such as lighting up from the hilt to the tip
- Best brands: SaberForge, Ultrasabers, Vader's Vault, and Electrum Sabers ($175-200)
  - Disney also sells their own at Galaxy's Edge ($200)
- Used for cosplays and dueling

My Saber:

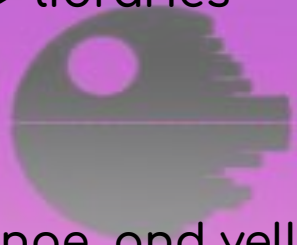
- Uses Arduino Nano 33 Iot
  - SAMD21 board
- Uses 268 individually addressable LEDs
- 2 tactile push switches:
  - One for turning blade on and off
  - One for changing the color
- 1 toggle switch
  - To cut power to system when not using
- 4AA batteries
- 3D Printed Hilt
- 1" diameter polycarbonate tube

My Code: Switches

- Define switches:
  - Pin #
  - High means unpressed, low means pressed using
- For Blade Switch:
  - Check if it !=HIGH and that there is a pending press of the button
    - There is a pending press is the blade isn't already animating
    - Delay 500ms once pressed
  - Int BbladeState: tells if it is off (0), animating up (1), up (2) or animating down (3)
    - If it is up, check for motion of accelerometer
- For Color Switch:
  - If pin !=HIGH
    - Switch to next color
    - Change blade color
    - Delay 500ms

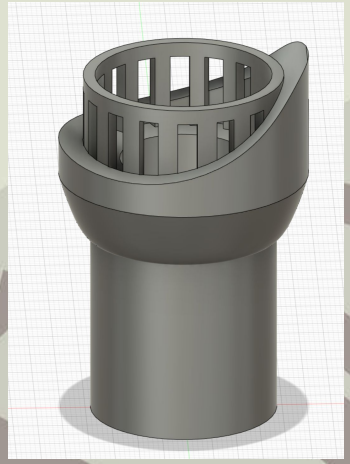
My Code: LED Colors

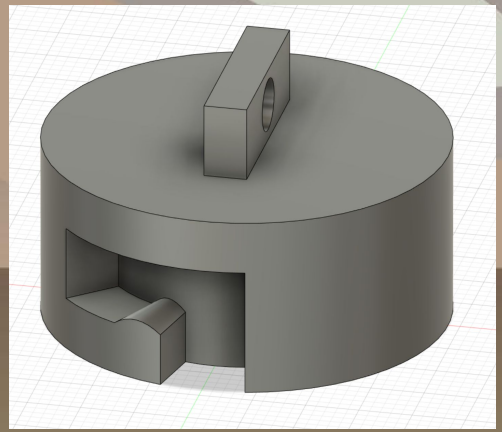
- Uses <Adafruit_NeoPixel.h> and <Arduino_LSM6DS3.h> libraries
- Blade colors
  - Uses uint32_t data type for setting color
    - blade.Color(R, B, G)
  - Set up color array of green, purple, cyan, red, orange, and yellow
- Use for loops to address individual LEDs
- Motion method:
  - Finds magnitude of x,y,z acceleration values
  - If magnitude>2.8, flashes white for 200ms



My Hilt (3D Printed)

- Used Fusion 360 (CAD)
- 3 parts
  - Main lightsaber hilt
  - Bottom cap
  - Top blade holder
- Everything slides in with resistance
- Snap fit bottom cap
- Grooves to make circuit board diagram



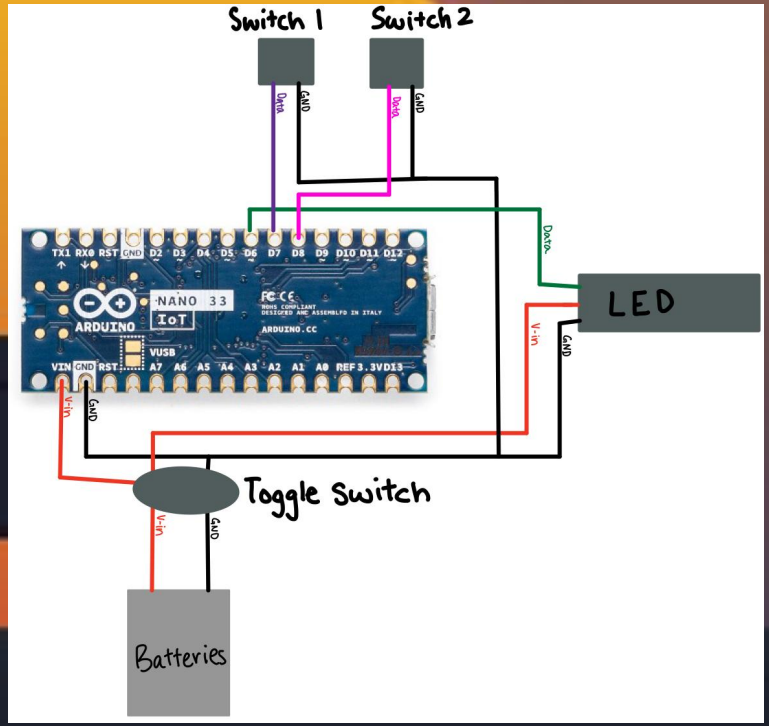


Sanding and Painting

- Filler primer and sanding
- Metallic silver
- Band paint black
- Frosted glass top coat

Assembly

- Upload sketch to Arduino
- Solder all wires together
  - Cut of plastic covering to solder easily to pins on arduino
- Wrap LEDs in parchment paper
- Hot glue blade to holder, and holder to hilt



Final Output: