



Reindeer Mask with Animated Eyes

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<https://learn.adafruit.com/reindeer-mask-with-animated-eyes>

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Overview

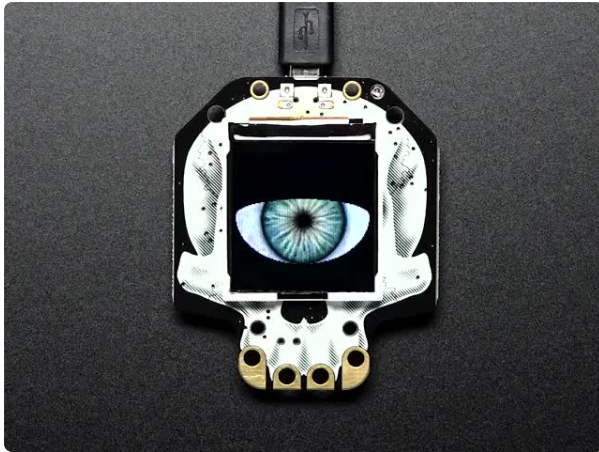
This project shows you how to create a "living" mask, great for display, a holiday party, or for a spooky Halloween costume.



For this project you will need a mask that you're willing to modify. [This foam reindeer mask](https://adafruit.it/Dch) (<https://adafruit.it/Dch>) is excellent for this purpose, because it is easy to cut and poke holes in for the purposes of outfitting it with electronics.

Parts





Adafruit HalloWing M0 Express

This is Halloween..this is Halloween...
Halloween! Halloween! Are you the kind of
person who doesn't...

<https://www.adafruit.com/product/3900>



Convex Plastic Lens with Edge

The eyes have it! Add this little lens to
make a big expression with our Spooky
Eyes demo for microcontrollers or
Raspberry Pi. These are plastic lenses,
with brilliant clarity and a...

<https://www.adafruit.com/product/3917>



USB cable - USB A to Micro-B

This here is your standard A to micro-B
USB cable, for USB 1.1 or 2.0. Perfect for
connecting a PC to your Metro, Feather,
Raspberry Pi or other dev-board or...

<https://www.adafruit.com/product/592>



Lithium Ion Polymer Battery Ideal For Feathers - 3.7V 400mAh

Lithium-ion polymer (also known as 'lipo'
or 'lipoly') batteries are thin, light, and
powerful. The output ranges from 4.2V
when completely charged to 3.7V. This...

<https://www.adafruit.com/product/3898>



[Diffused Red 10mm LED \(25 pack\)](https://www.adafruit.com/product/845)

Need some big indicators? We are big fans of these huge diffused red LEDs. They are fairly bright so they can be seen in daytime, and from any angle. They go easily into a breadboard...

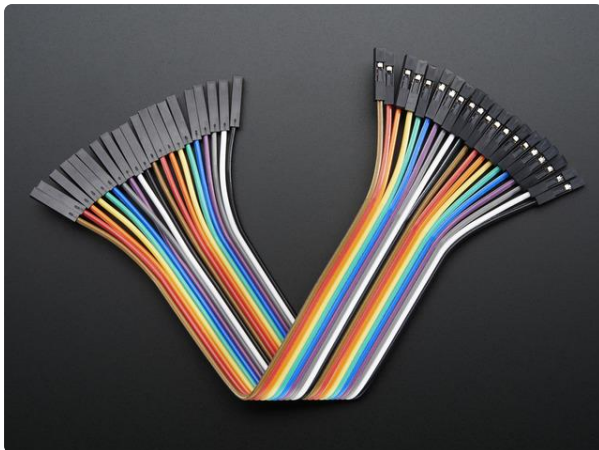
<https://www.adafruit.com/product/845>



[STEMMA Cable - 4 Pin JST-PH 2mm Cable-Female/Female](https://www.adafruit.com/product/3568)

This 4-wire cable is a little over 150mm / 6" long and fitted with JST-PH female 4-pin connectors on each end. These types of JST cables are commonly found on small rechargeable...

<https://www.adafruit.com/product/3568>



[Premium Female/Female Jumper Wires - 20 x 6" \(150mm\)](https://www.adafruit.com/product/1950)

These female-female jumper wires are handy for making wire harnesses or jumpering between headers on PCB's. These premium jumper wires are 6" (150mm) long and come in a...

<https://www.adafruit.com/product/1950>



[Hook-up Wire Spool Set - 22AWG Solid Core - 6 x 25 ft](https://www.adafruit.com/product/1311)

Perfect for bread-boarding, free wiring, etc. This box contains 6 spools of solid-core wire. The wire is easy to solder to and when bent it keeps its shape pretty well. We like to have...

<https://www.adafruit.com/product/1311>

Materials

- Mask
- Fishing line or string
- Hot glue gun
- [Double sided foam tape \(https://adafru.it/Cni\)](https://adafru.it/Cni)
- Ping pong ball (optional)

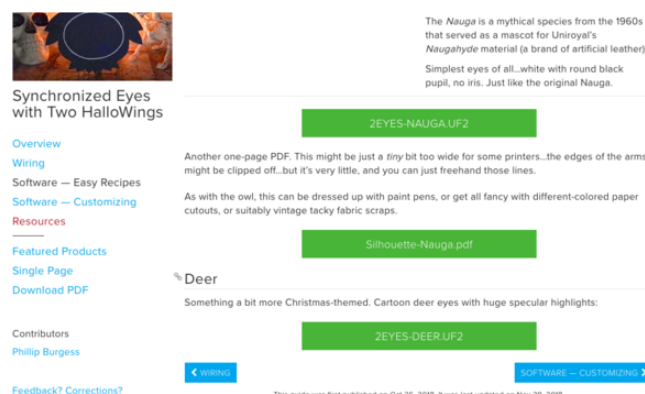
Build the Circuit

Most of this project consists of using two [Adafruit HalloWing boards \(http://adafru.it/3900\)](http://adafru.it/3900). Each board has an onboard processor and a nice LCD display. Adafruit has developed specialized software for displaying different types of blinking, moving eyes which move in unison if the two boards are wired together.

Before creating the mask, we first need to link two Hallowings together to create a realistic pair of synchronized eyes.

Follow [this guide to link and synchronize your eyes \(https://adafru.it/Dcf\)](https://adafru.it/Dcf).

When linking two HalloWings, be sure to leave enough length of wire between them to be able position the two HalloWings comfortably inside your mask.



You can choose from a variety of eyes, experimenting with what versions you like best. For this project we will be using the DEER eyes, to match the reindeer theme (Human, Owl, Cat, and Nauga eyes are also available).

When you plug a HalloWing board into your computer (PC/mac/Linux), press reset so that you see a flash drive connected to your computer in the file explorer/finder

named **HALLOBOOT**; If you see a drive named **CIRCUITPY**, press reset again, the drive should eject and then show up again as a new drive named **HALLOBOOT**.

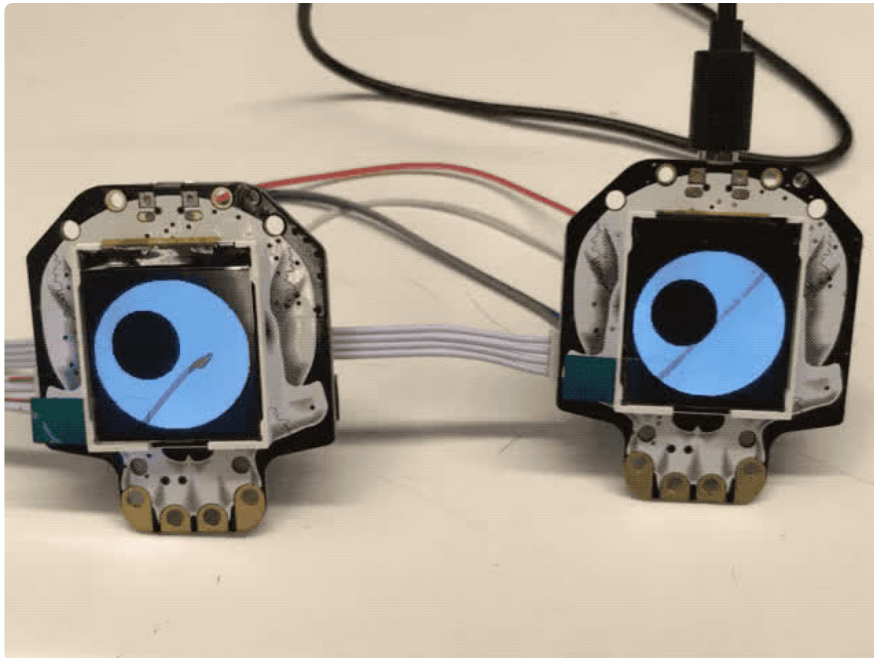
Download the UF2 file below and drag it onto each HalloWing's **HALLOBOOT** flash drive (you will need to do this separately to each of the HalloWings).

2EYES-DEER.UF2

<https://adafru.it/Dcg>

Power up your HalloWing and make sure both eyes come on.

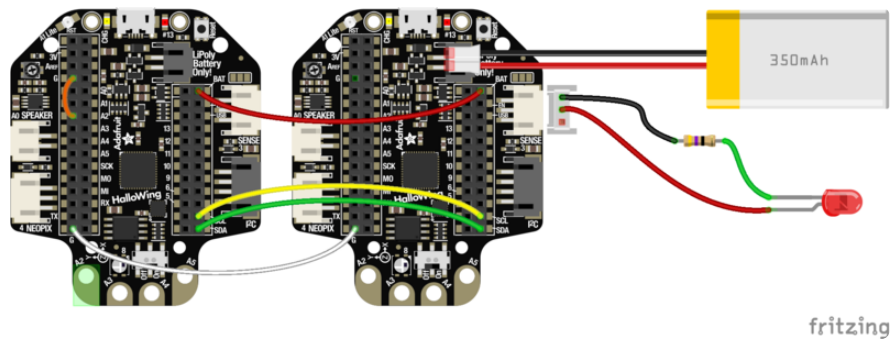
Once you've confirmed they are working, move on to the next step of adding an LED to the circuit.



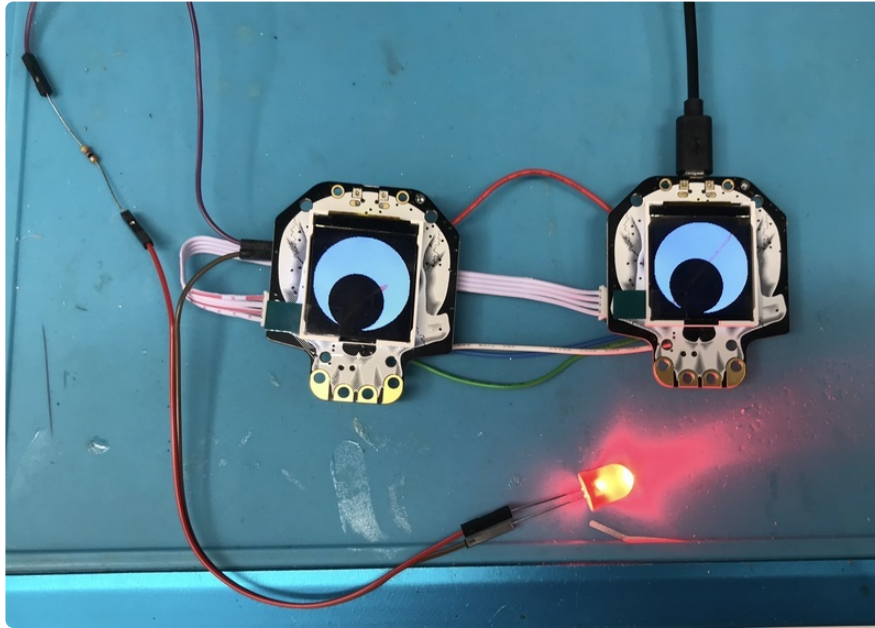
Add an LED

Using female/female 0.1" jumpers, connect the **GND** and **V+** pins on the JST 3-PH **SENSE** port to the LED.

Include a resistor with a value in the 47 ohm - 75 ohm range in the circuit (this will protect the LED). Choosing a higher resistor value will result in a dimmer LED.



When you're finished, your circuit should look like this:



Modify the Mask

Once you've got your circuit built and tested, it's time to prepare your mask to install the electronics.

Depending on the type of mask you have, you may be able to skip or adapt some of these steps to suit the differences in your particular mask.



Widen eye holes

Trace the outline of the lens.



Cut about 1/4" inside the outline you've drawn, so the lens doesn't fall through.

Press lenses into eye socket, adjust size of hole as necessary using diagonal clippers.



Use a line of hot glue around the rim of the lens to hold it securely in place.





Add fishing line

Thread fishing line or string above and below eye socket.



This will hold the Hallowing in place tight against lens.



Add LED

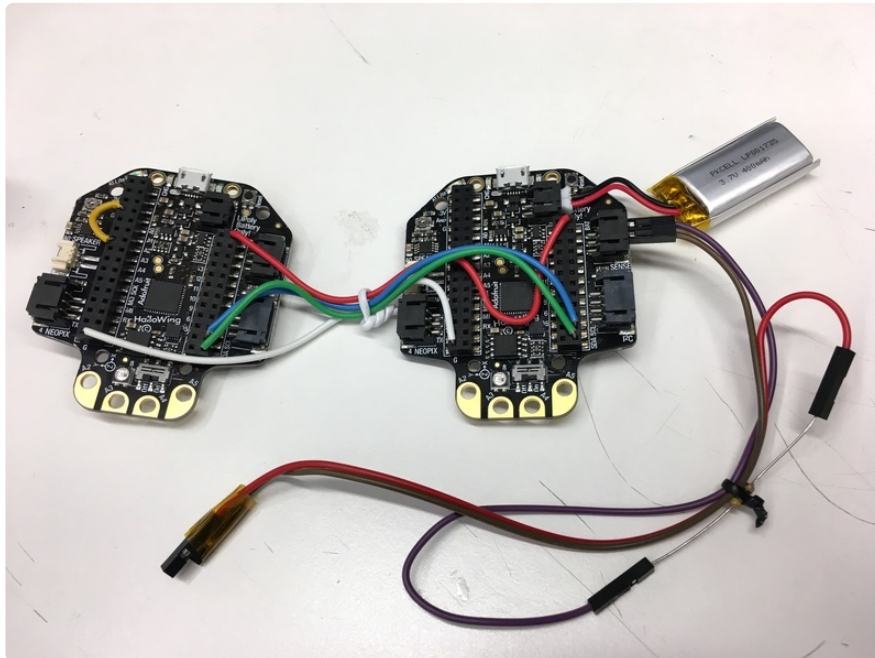
Cut a hole for the 10mm red LED, snipping through the back of the nose.

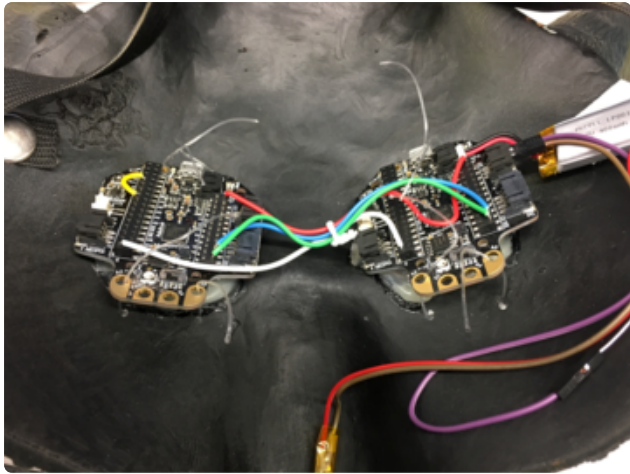
Insert the LED through this hole.



Connect the Electronics

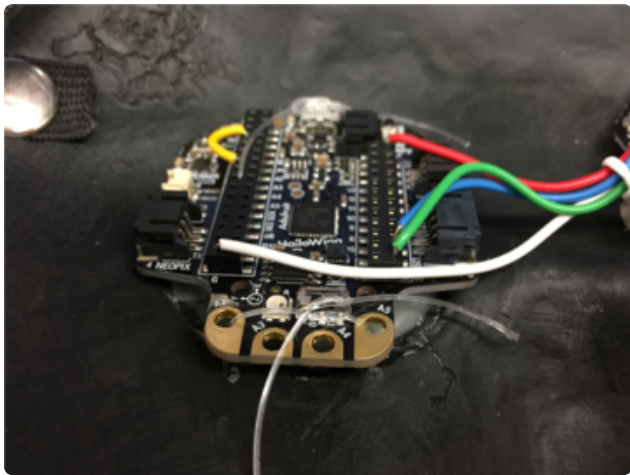
Cable management is a big factor with anything that is going to go on your face. The use of some twist-ties or tape to gather all your wires together can be helpful in keeping them in order.





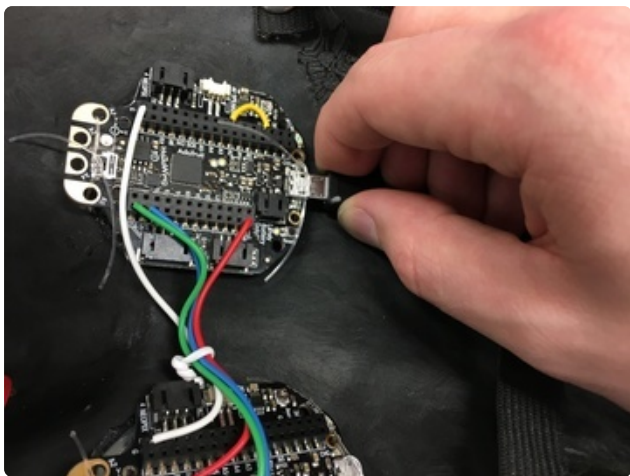
Tie down the eyes

Use fishing line to tie Hallowings to inside of mask.

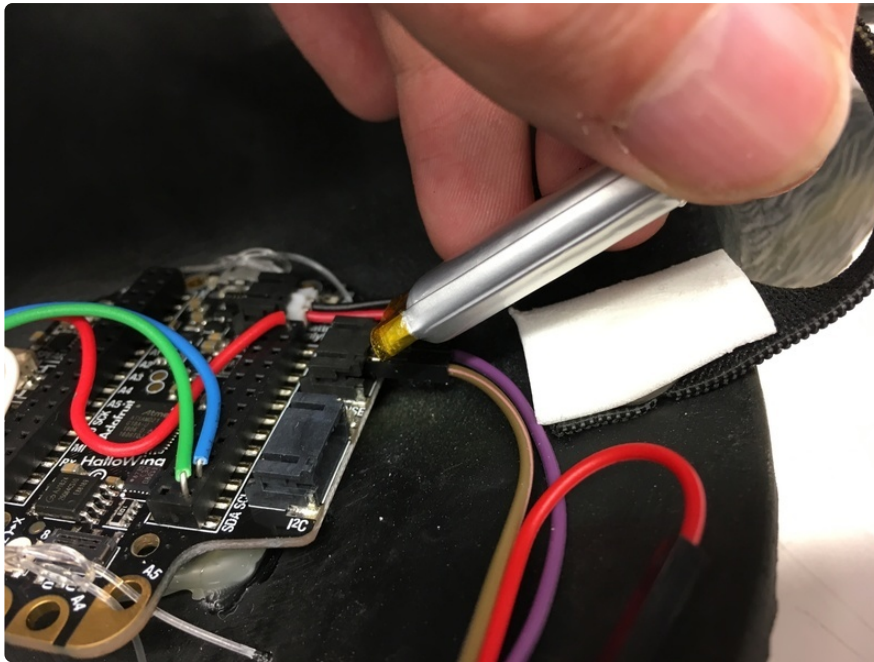


Check that all your wires are still connected as they should be.

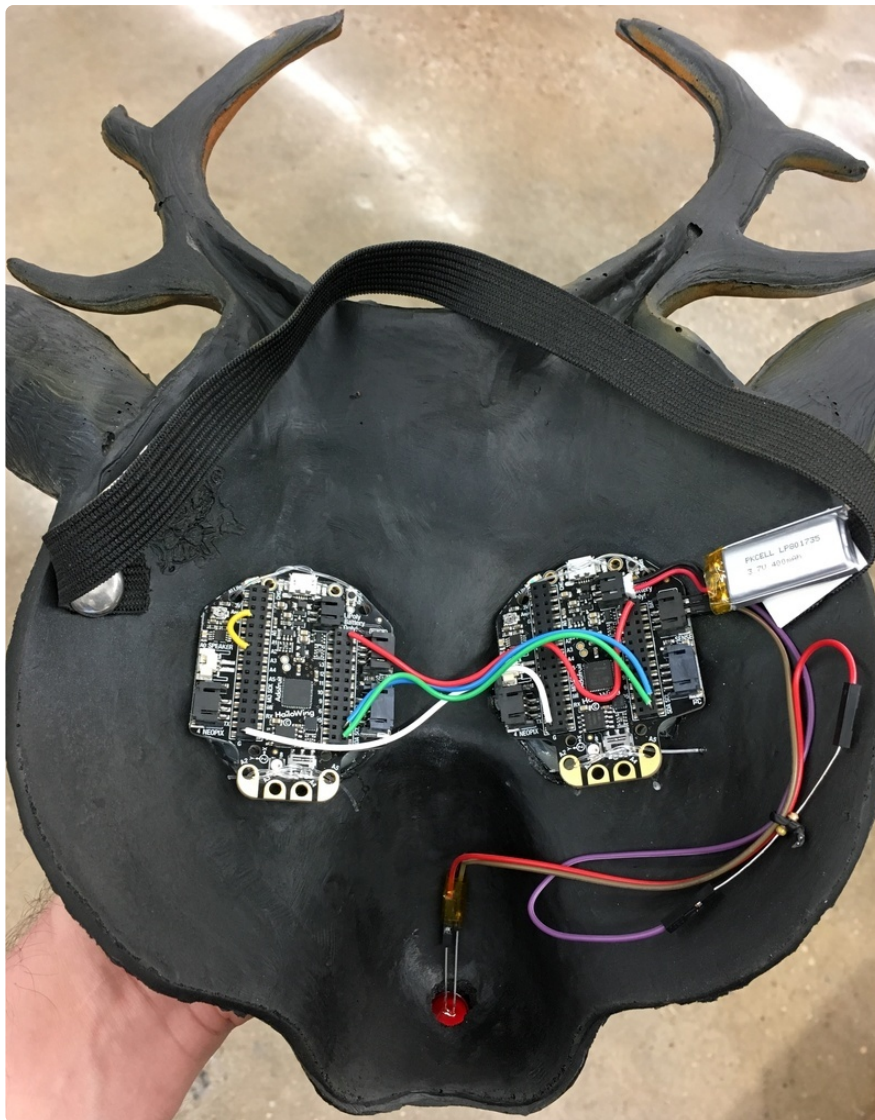
If you need to change the code on either of the HalloWings, you can still connect a micro USB cable to them while they're in the mask, just make sure your ties are loose enough.



Use a small piece of double sided foam tape to stick the small 400mAh battery to the inside of the mask.



Your mask should now have everything it needs to run! A rectangle of felt (or a folded paper towel) will work to pad the interface between the mask's electronics and your face.





Nose diffusion

Optionally, you can slice up a ping pong ball to create a diffuser for Rudolph's nose.



A few dabs of hot glue work to hold the diffuser in place over the LED.



Have fun hanging your Rudolph mask on a wall, or wearing it around.

As with anything that might cover your eyes, do not wear the mask where you need vision to walk (drive, eat, etc.). Safety first.

