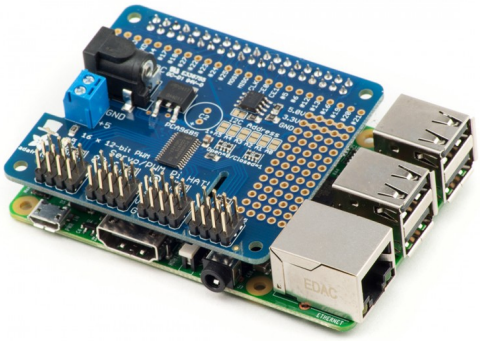
Webcam to website with button operated Servo

The project:

Use Mjpg-streamer to stream video from a webcam to a website. The website will have 3 buttons that will move the camera around.

Things needed:

- Raspberry Pi
- Adafruit Servo Pi Hat w/ 5v power supply.



Servo:

- Soldering iron and some tin.

Starting out:

- First things first is you need solder the correct connectors to the Pi, otherwise it will be upside and you'll have to buy a new one (like I did)

- Next, hook up wire thingy to the side connectors. Make sure the colors are correct, otherwise you probably could short something out. I don't know?

- This is where stuff gets tricky: You're going to have to to the following link: https://learn.adafruit.com/adafruits-raspberry-pi-lesson-4-gpio-setup/configuring-i2c and set up the Pi for using the Pi hat, there is a special way to do it. It needs i2c kernal support.

- (Optional)Try using adafruit's library found here: https://learn.adafruit.com/adafruit-16-channel-pwm-servo-hat-for-raspberry-pi/library-reference it is very limited and you're going to have to figure out things on you own.

Setting up the camera

- Camera setup is pretty easy, make you're pi is enable to allowed webcams in the raspi-config section.
- Get the mpeg streamer package and install and run here: https://www.raspberrypi.org/forums/viewtopic.php?t=48597

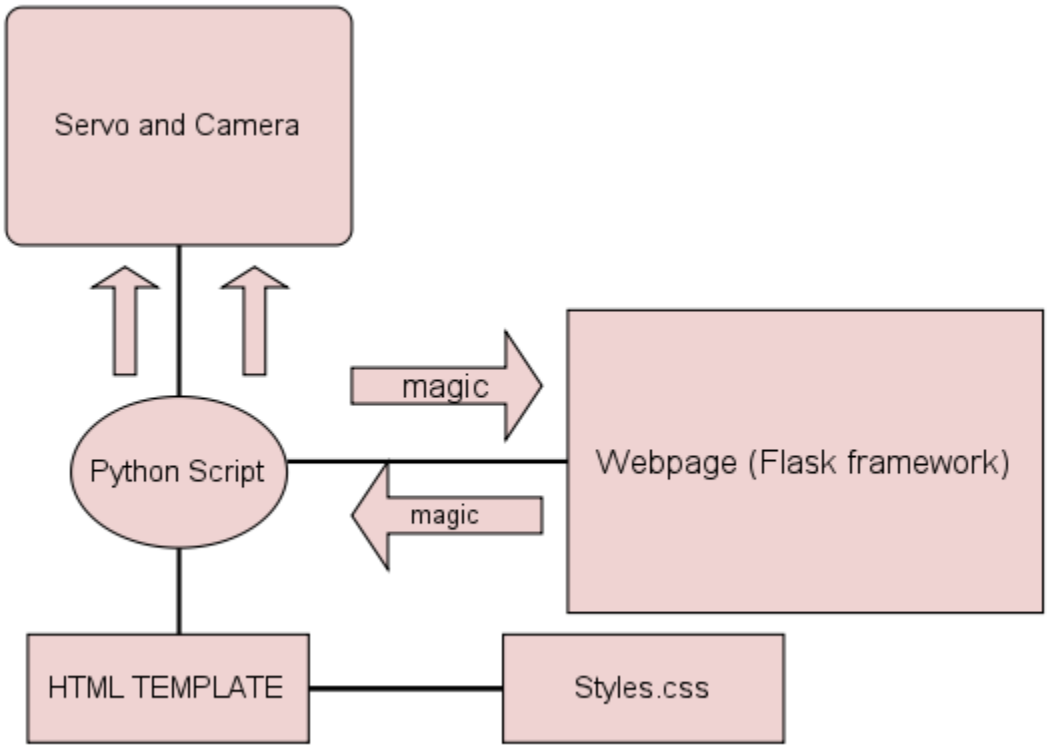
- Next, you'll need a web framework and Flask seems to be the one everyone uses. Guide here: http://flask.pocoo.org/docs/0.10/installation/
- Mjpeg streamer command (>./mjpg_streamer -i "./input_uvc.so -d /dev/video0 -y -r 320x240 -f 15" -o "./output_http.so -p 8090 -w ./www")
- Lastly, you'll need to do some coding:
  - Use app route to deal with returning URLS.
  - Ajax/Jquery inside the html file for adding buttons, images, and stream.
  - You could also add a css page, but I'm too lazy.

Coding

- python to handle Flask/url returns as well as operating the servo.
- Html for the actual webpage.
- Javascript with Ajax/Jquery embedded in the html

Prototype webpage

Diagram



Some python code: Handles direction keywords

```python
#ROUTE
@app.route("/<direction>")
def move(direction):
        global currentDirection
        if direction == 'left':
                pwm.setPWM(0, 0, servoMax)
                time.sleep(.02)
                cleanup()
                currentDirection +=1
                print currentDirection
        elif direction == 'right':
                pwm.setPWM(0, 0, servoMin)
                time.sleep(.02)
                cleanup()
                currentDirection -= 1
                print currentDirection

          elif direction == 'return':
                if(currentDirection > 0 ):
```

Some html: Handles the buttons

```html
<table align="center" class="style1">
    <tr>
        <td colspan="2" style="text-align: center">

            <button type="button1" onclick="Button_onclick('left')" class="btn btn-primary">LEFT</button>
            <button type="button2" onclick="Button_onclick('right')" class="btn btn-primary">RIGHT</button>
            <button type="button3" onclick="Button_onclick('home')" class="btn btn-primary">RETURN</button>

            <input id="btnLeft" type="button" value="Left" onclick="Button_onclick('left')" />
            <input id="btnRight" type="button" value="Right" onclick="Button_onclick('right')" />
            <input id="homeButton" type="button" value="Return" onclick="Button_onclick('return')" />
        </td>
    </tr>

</table>
```