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antibody-br / **ServoControl**

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Remote servo control using Python, Arduino, OSC and TouchOSC App with Smartphone (iPhone iOS or Android) Edit

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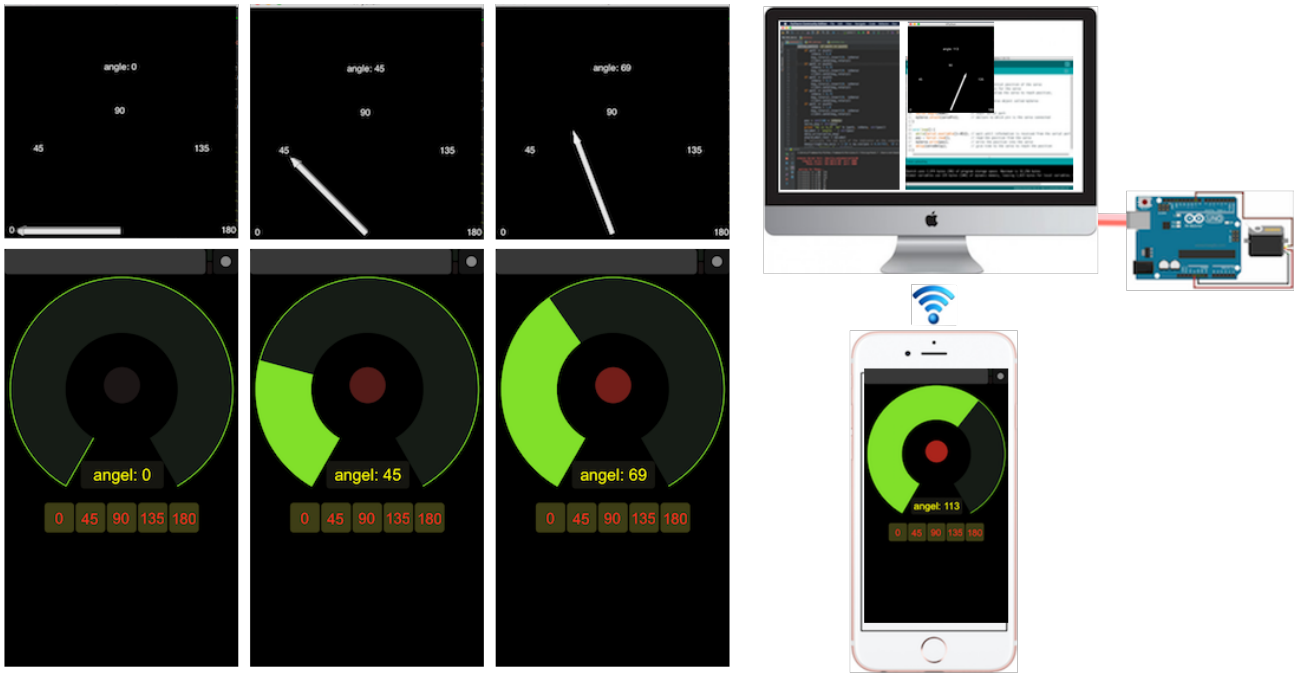
antibody-br committed on **GitHub** Update README.md Latest commit 83b3ca2 20 minutes ago

image	Add files via upload	an hour ago
OSC_servo.py	Add files via upload	an hour ago
README.md	Update README.md	20 minutes ago
Servo.touchosc	Add files via upload	an hour ago
Servo_Control.ino	Add files via upload	an hour ago

README.md

ServoControl

Remote servo control using Python, Arduino, OSC and TouchOSC App with Smartphone (iPhone iOS or Android)



This program is based on the code and instructions from **SILVINO J. A. PRESA**: http://www.silvinopresa.com/how-to/python/control-a-servo-with-arduino-and-python-vpython/ **<-THANK YOU!** and adapted by me for remote control with the touchOSC app.

I am not an experience Python programmer, so I wrote a mickey-mouse code to control a servo with my iPhone. There are for sure much clever way's to do this, so feedback and improvements are very welcome.

For instance I use an UDP server to get the controller path from the touchOSC app and then I start an OSC server to control it. There must be a smarter way to do this.

so here we go:

index:

code	program	device
OSC_servo.py	python IDE	computer
Servo.touchOSC	touchOSC editor	computer => phone touchOSC
Servo_Control.ino	Arduino IDE	computer => Arduino

Steps:

1) Set up Arduino Circuit

2) Computer: load `Servo.touchosc` layout in `TouchOSC editor`

3) synchronize layout with Phone `TouchOSC` app.

4) load `Servo_Control.ino` sketch in `Arduino IDE` and compile to Arduino device

5) load `OSC_Control.py` in python IDE, and run it.

6) Now you can control the servo with your Phone

Requirements:

Software

on Mac or PC:

- **Python editor:** I prefer PyCharm (mac/win): https://www.jetbrains.com/pycharm/
- **Arduino IDE:** https://www.arduino.cc/en/main/software
- **touchOSC editor:** https://hexler.net/software/touchosc **=> scroll to the end of the page: Downloads -> choose your OS.**
- **touchOSC app:** iOS: https://hexler.net/software/touchosc android: https://hexler.net/software/touchosc-android price: $5

Python Modules

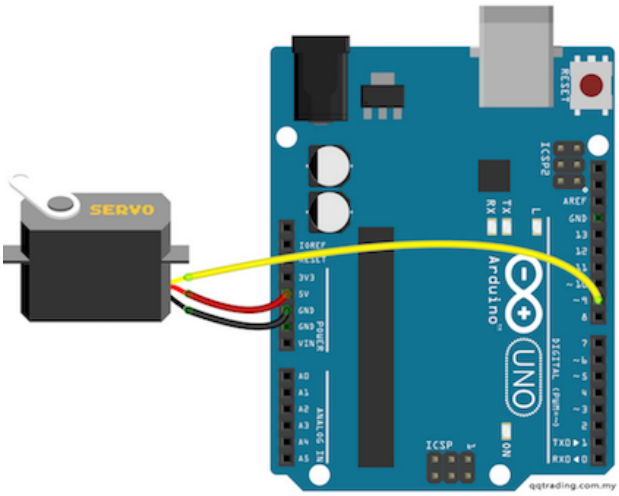
I use **Python 2.7.13**, on the **Mac** be sure you use the **FrameWork version**, otherwise the Vpython graphic display will not work: `/opt/local/Library/Frameworks/Python.framework/Versions/2.7/bin/python2.7`

- **OSC:** Unix terminal: `$ pip install pyosc` or download: https://github.com/ptone/pyosc
  if you have trouble installing it, you can also put the `OSC.py` that is in the downloaded package, in the same folder you have `OSC_Servo.py`
- **Vpython:** `$ pip install vpython`
- **serial:** `$ pip install pyserial`
- **numpy:** `$ pip install numpy`
- **socket:** I guess it is a standard Python package, but had a lot of trouble getting it working. Be sure you have no other socket.py some where in your directories.

Hardware

- **Arduino Board (Uno):** https://www.arduino.cc/ and many other companies. $15, My UNO comes from China (Oops!)
- **Servo Motor:** I use TowerPro SG90, do a google search and you get a lot of hits. Around $5

Circuit diagram

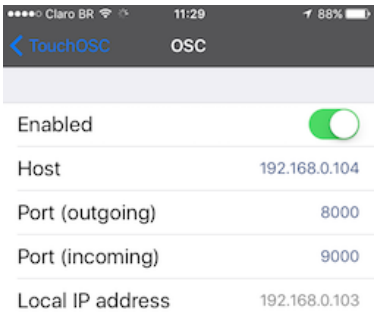


TouchOSC editor on Computer

Double click the `Servo.touchosc` file, and the `TouchOSC editor` should open or open it from inside the editor.
Click the `Sync` button, in the upper right of the window => https://hexler.net/docs/touchosc-editor-sync

ToucOSC app on Phone

- click the white spot on upper right of the window, choose the upper item
- `OSC:` and fill in the `IP address` , variable in the `OSC_Control.py => serverAdr = "192.168.0.104" <=` **YOU HAVE TO CHANGE this to your computer `IP address` !!!**
- `Port(outgoing)` is set to `8000` , variable in the `OSC_Control.py => serverPort = 8000`
- `Port(incoming)` is set to `9000` , variable in the `OSC_Control.py => clientPort = 9000`
- `Local IP address` is variable in `OSC_Control.py => clientAdr = "192.168.0.102" <=` **ofcource you have to change this to your Phone `IP address` !!!** Bellow the settings on my iPhone:



Return to `<TouchOSC` upper left corner and choose the item under `LAYOUT` , choose `Add`
Choose the host from the list. Now you can choose the `Servo` layout.

see also https://hexler.net/docs/touchosc-configuration-layout-transfer-wifi

Arduino IDE

In the Arduino IDE on your computer: open the `Servo_Control.ino` file and send it to the Arduino. Be sure that the right type Arduino and serial Port is selected => `Menubar -> Tools -> Board: / Port:`
Now you see also the name of the **serialPort that you need to set** in `OSC_Control.py` => variable: `serialPort = "/dev/tty.wchusbserialfa130"` . On the Mac it is similar like this, on WIN is some thing like `COMn`
see also: https://learn.adafruit.com/ftdi-friend/com-slash-serial-port-name

First compile your sketch, **do not** open the serial monitor, **and then run** `OSC_Control.py` Other wise you get the message: **avrdude: ser_open(): can't open device "/dev/cu.wchusbserialfa130": Resource busy**

OSC_Control.py

to find your IP address:
Mac: http://osxdaily.com/2010/11/21/find-ip-address-mac/
WIN: https://support.microsoft.com/en-us/help/15291/windows-find-pc-ip-address

!!! change the variables according to your enviroment !!!

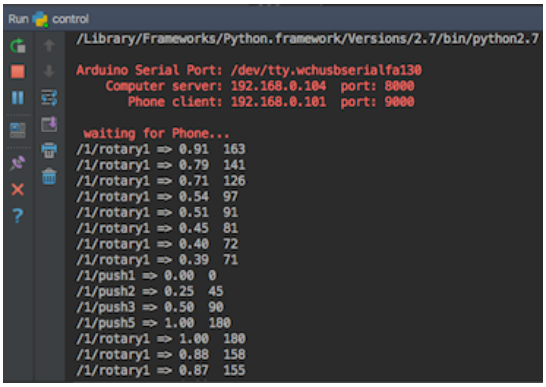
```
serialPort = '/dev/tty.wchusbserialfa130'
serverAdr = "192.168.0.104"
serverPort = 8000
clientAdr = "192.168.0.102"
clientPort = 9000
```

WARNING: if you not use a fix IP address, but get if from a DHCP server, the IP address can change, special on the Phone, that is re-conecting to your network if you return from an other place. error message is e.g:

OSCServer: NoCallbackError on request from 192.168.0.103:64550: No callback registered to handle OSC-address '/1/push2'

you see: if have my Phone IP defined as `192.168.0.102` but it is now: `192.168.0.103`
Check again your touchOSC app to see if it is still the same.

it take a few moments to start, on my compter 20 sec., also its a bit slow to receive the fist messages. Keep turning the rotary till it gets it. Output looks like this:



conroller => output angle

Famous last words: "IT SHOULD WORK!"

Happy trouble shooting and debugging!!!

-=b=-

bert@temminck.net, April 2017, Anápolis-GO, BRASIL

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