

2022.11.16

First use the stretch sensor. Successfully get the reading from Arduino.

2022.12

stretch sensor was embeded into the socks. But was damaged because it has limited elasticity. So this sensor cannot be used in practical wearable application. Decide to use the flex sensor instead.



Δr is swelling

$$\Delta r = \theta' (r + \Delta r)$$

$$\theta' = \frac{1}{\frac{\Delta r}{r} + 1} \theta$$

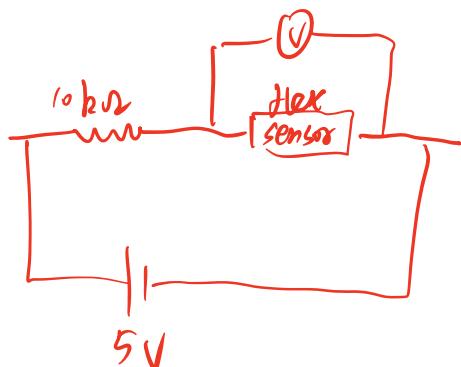
$\therefore \omega \uparrow \theta' \downarrow$

bending \uparrow .

\therefore flex sensor can be used to monitor the swelling and the reading should be linear.

2022.12.15

Successfully turn to flex sensor



when $\omega \uparrow$
 $\theta' \uparrow$ bending \uparrow $\Delta \uparrow$
 $V \uparrow$

• The average filter.

First set a threshold to get rid of noise (damping)

Then set sample rate to 30

$$\frac{\sum_{i=1}^{50} \text{reading}_i}{30}$$

2023.01.03

BN0055 Gyro sensor

Easily get the reading from the sensor.

Angle (x,y,z) Acc (x,y,z)

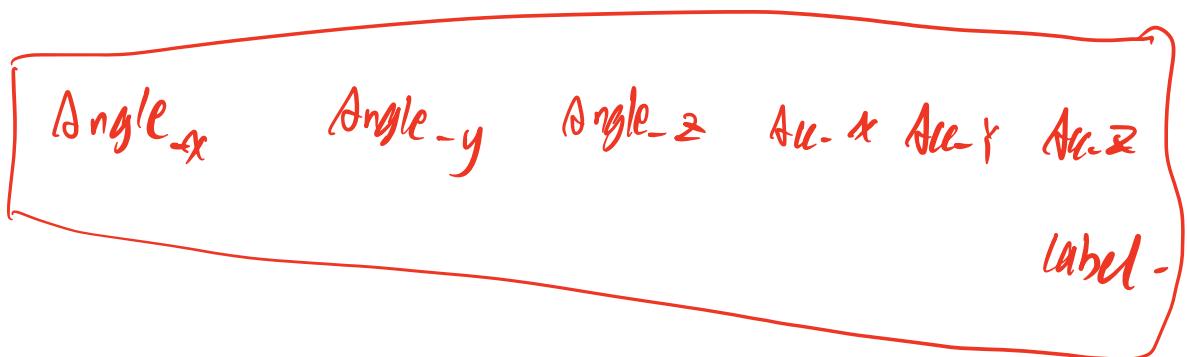
2023.01.13

Send the Gyro data to python

via the HC-05 BT module.

Write the python script for auto

data collection.



2023.01.25

Unable to deploy the model to Arduino,
CPU too limited. We need to find
a way to detect the moving only using
sensor raw data.

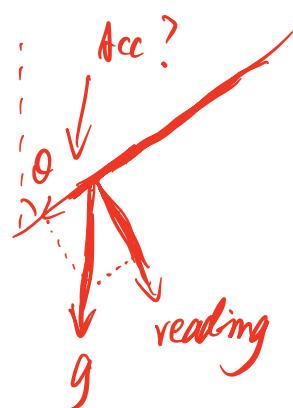
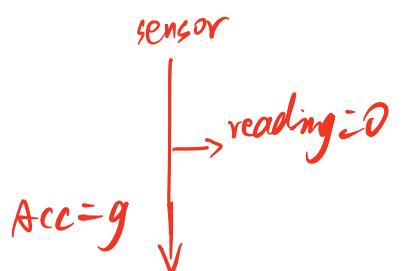
2023.02.02.

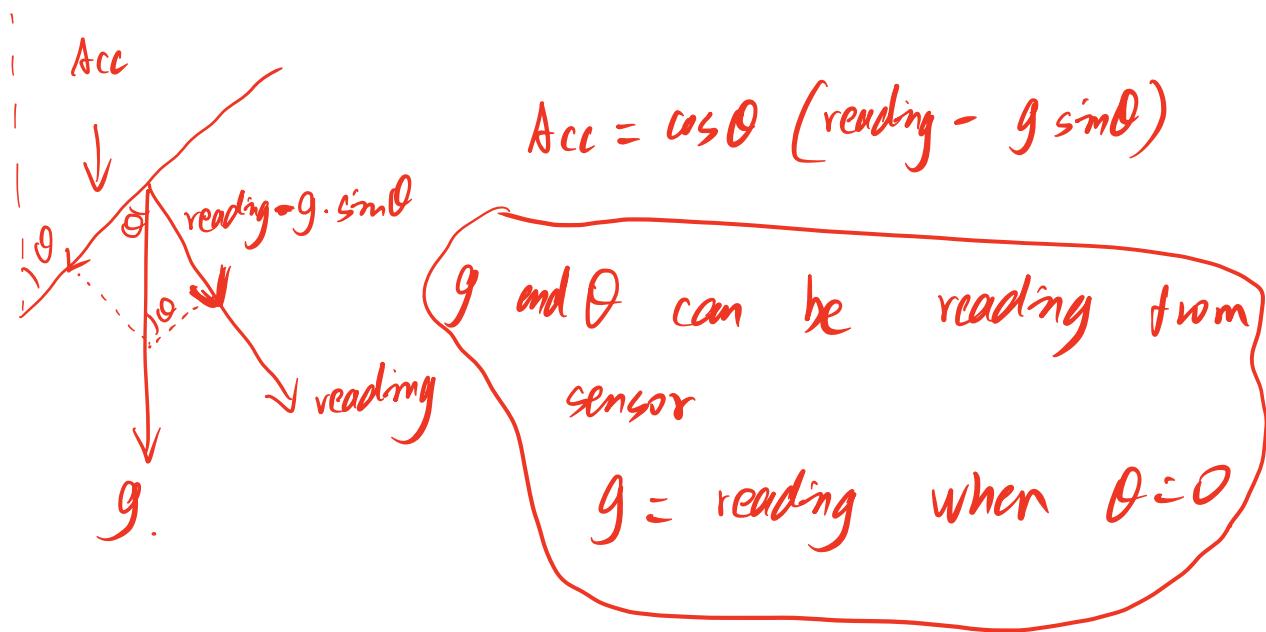
Just as the flex sensor, we need to
write a average filter for gyro.

But we needn't threshold because noise
in gyro sensor reading is already be removed in the chip.

The difference between still and moving is the change in Acc.

But due to the gravity, even we do not moving, just tilt the sensor, still is still Acc reading. So we need to remove the effect of gravity.





20 23.02.20

Change the BT from HC-05 to HM-10, which is more friendly to IOS and Mac. HM-10 can receive the CMD and return, to user.
the response message

The AT pins must operate on 3.3V. So need use resistors to pull down from 5V to 3.3V.

2023.03.03

The warning system. Only give warning when user are still. Using BT to give warning.

2023.03.10.

BT CMD control

the CMD list (sys-CMD-List)

the mode flag (sys-mode-flag)

BT-CMD-Control (sys-cmd-list)

Only need to modify the list

The system can remember the mode status
by sys_mode flag