

1. Reference environment configuration

1.1 Linux environment selection

uname -a

```
wit-motion@witmotion-ThinkPad-X220:~$ uname -a
Linux witmotion-ThinkPad-X220 4.8.0-36-generic #36~16.04.1-Ubuntu SMP Sun Feb 5
09:39:57 UTC 2017 x86_64 x86_64 x86_64 GNU/Linux
```

1.2 The selection of python version

python3 --version

```
wit-motion@witmotion-ThinkPad-X220:~$ python3 --version
Python 3.5.2
```

1.3 Download of related dependency libraries

sudo apt-get install python3-pip libglib2.0-dev

sudo pip3 install bluepy

2. Introduction of program functions

2.1 Basic introduction to default programs

cd blue

sudo python3 wit_ble.py

```
wit-motion@witmotion-ThinkPad-X220:~/blue$ sudo python3 wit_ble.py
Scanning for devices...
Traceback (most recent call last):
  File "wit_ble.py", line 175, in <module>
    main()
  File "wit_ble.py", line 113, in main
    devices = scanner.scan(arg.timeout)
  File "/usr/local/lib/python3.5/dist-packages/bluepy-1.3.0-py3.5.egg/bluepy/btle.py", line 885, in scan
    self.start(passive=passive)
  File "/usr/local/lib/python3.5/dist-packages/bluepy-1.3.0-py3.5.egg/bluepy/btle.py", line 823, in start
    self._mgmtCmd("le on")
  File "/usr/local/lib/python3.5/dist-packages/bluepy-1.3.0-py3.5.egg/bluepy/btle.py", line 325, in _mgmtCmd
    raise BTLEManagementError("Failed to execute management command '%s'" % (cmd), rsp)
bluepy.btle.BTLEManagementError: Failed to execute management command 'le on' (code: 17, error: Invalid Index)
```

The above can't work because the current system's Bluetooth does not support BLE function.
At this point, we can use external tools



Run the same command again

```
wit-motion@witmotion-ThinkPad-X220:~/blue$ sudo python3 wit_ble.py
Scanning for devices...
Device (new): 64:d2:12:6b:b2:14 (random), -79 dBm
Device (new): 51:c3:39:bd:dc:fa (random), -79 dBm
Device (new): 7f:b5:b3:0b:81:12 (random), -84 dBm
Device (new): 58:71:14:e1:b4:7d (random), -88 dBm
Device (new): fa:a8:9a:2f:a8:2b (random), -88 dBm
Device (new): ec:4d:3e:5c:f7:20 (public), -86 dBm
Device (new): 62:0d:30:0c:52:65 (random), -82 dBm
Device (new): 77:9d:f7:66:a9:96 (random), -78 dBm
Device (update): 64:d2:12:6b:b2:14 (random), -86 dBm
Device (new): d0:3e:7d:a4:b0:10 (public), -49 dBm
Device (update): d0:3e:7d:a4:b0:10 (public), -46 dBm
Complete Local Name: 'WT901BLE67'
find WT901BLE67 device
Handle  UUID  Properties
-----
0x03  00002a00-0000-1000-8000-00805f9b34fb  READ
0x05  00002a01-0000-1000-8000-00805f9b34fb  READ
0x07  00002a04-0000-1000-8000-00805f9b34fb  READ
0x0A  00002a05-0000-1000-8000-00805f9b34fb  INDICATE
0x0E  0000ffe4-0000-1000-8000-00805f9a34fb  NOTIFY
0x11  0000ffe9-0000-1000-8000-00805f9a34fb  WRITE NO RESPONSE
handleNotification
acc:0.01,-0.00,1.02 gyro:0.00,0.00,0.00 angle:-0.16,-0.76,156.43
acc:0.01,-0.00,1.02 gyro:0.00,0.00,0.00 angle:-0.16,-0.76,156.43
acc:0.01,-0.00,1.02 gyro:0.00,0.00,0.00 angle:-0.16,-0.76,156.43
acc:0.01,-0.00,1.02 gyro:0.00,0.00,0.00 angle:-0.16,-0.76,156.43
acc:0.01,-0.00,1.02 gyro:0.00,0.00,0.00 angle:-0.16,-0.76,156.43
acc:0.01,-0.00,1.02 gyro:0.00,0.00,0.00 angle:-0.16,-0.76,156.43
acc:0.01,-0.00,1.02 gyro:0.00,0.00,0.00 angle:-0.16,-0.76,156.43
acc:0.01,-0.00,1.02 gyro:0.00,0.00,0.00 angle:-0.16,-0.76,156.43
acc:0.01,-0.00,1.02 gyro:0.00,0.00,0.00 angle:-0.16,-0.76,156.43
acc:0.01,-0.00,1.02 gyro:0.00,0.00,0.00 angle:-0.16,-0.76,156.43
acc:0.01,-0.00,1.02 gyro:0.00,0.00,0.00 angle:-0.16,-0.76,156.43
mag:4156,-9665,-6701
acc:0.01,-0.00,1.02 gyro:0.00,0.00,0.00 angle:-0.16,-0.76,156.43
acc:0.01,-0.00,1.02 gyro:0.00,0.00,0.00 angle:-0.16,-0.76,156.43
```

Since the program default searches for WT901BLE67, and the Bluetooth sensor of this type is turned on at this time, the sensor of this type is connected, and the data related to acceleration, angular velocity, angle, and magnetic field are returned.

Shake the sensor at this time, and you can find that the data sent back by the sensor is sent back in real time.

```
acc:-0.13,0.09,0.99 gyro:212.83,-7.93,64.33 angle:9.35,7.43,86.01
acc:-0.03,0.60,0.93 gyro:219.48,-25.57,60.36 angle:33.09,1.10,92.11
acc:0.05,0.85,0.63 gyro:215.21,-165.22,74.34 angle:52.29,-8.51,92.64
acc:0.15,0.84,0.52 gyro:82.46,-71.35,-0.06 angle:56.66,-11.30,92.82
acc:0.18,0.96,0.29 gyro:60.30,-36.93,0.61 angle:64.65,-13.18,91.92
acc:0.23,0.75,0.16 gyro:24.72,-12.27,-34.18 angle:66.99,-11.57,90.10
acc:0.00,1.01,-0.10 gyro:6.41,-38.27,4.52 angle:83.91,-3.13,87.28
acc:0.03,0.96,0.04 gyro:19.23,-5.80,5.19 angle:82.83,-3.30,87.35
acc:0.02,1.00,-0.03 gyro:4.76,-0.98,-0.79 angle:84.12,-3.22,88.34
acc:0.02,1.00,-0.04 gyro:-3.36,0.06,-0.49 angle:84.76,-3.05,88.92
acc:0.02,1.00,-0.06 gyro:-5.43,1.40,-2.38 angle:85.23,-2.85,89.85
mag:5270,-5087,1619
acc:0.02,1.00,-0.06 gyro:-1.89,62.87,-7.81 angle:85.33,-2.40,92.56
acc:-0.01,1.01,0.06 gyro:-87.83,11.23,-40.77 angle:80.56,-0.35,92.84
acc:-0.20,0.98,0.20 gyro:-86.98,99.98,-45.23 angle:73.00,8.18,93.38
acc:-0.31,0.75,0.21 gyro:-129.15,26.49,-109.68 angle:64.54,21.12,97.81
acc:-0.64,0.78,0.27 gyro:-20.20,73.61,-140.81 angle:58.93,41.34,97.55
acc:-0.78,0.57,0.26 gyro:-41.56,55.97,-18.92 angle:61.42,48.40,105.23
acc:-0.85,0.54,0.16 gyro:-27.77,5.62,-71.23 angle:64.39,53.91,110.76
acc:-0.97,0.41,0.17 gyro:-25.15,-90.52,-62.19 angle:55.79,58.57,104.98
acc:-0.77,0.32,0.61 gyro:22.89,-195.01,44.80 angle:30.96,39.24,77.94
mag:7594,1019,-195
acc:-0.48,0.51,0.74 gyro:-121.83,-140.93,25.88 angle:28.30,24.78,76.45
acc:-0.25,0.31,0.83 gyro:-171.51,-101.32,9.03 angle:19.31,17.72,75.04
acc:0.04,0.06,1.03 gyro:-13.00,-9.95,-2.93 angle:4.18,-0.06,71.20
acc:0.01,0.05,1.02 gyro:-0.55,-1.95,2.62 angle:4.35,0.22,71.23
acc:0.01,0.02,1.02 gyro:0.00,0.00,0.00 angle:4.04,0.16,71.37
acc:0.01,0.02,1.02 gyro:0.00,0.00,0.00 angle:3.92,0.16,71.56
acc:0.01,0.02,1.02 gyro:0.00,0.00,0.00 angle:3.78,0.13,71.78
acc:0.01,0.02,1.02 gyro:-0.06,0.00,0.00 angle:3.64,0.09,71.98
acc:0.01,0.02,1.02 gyro:0.00,0.00,0.00 angle:3.50,0.05,72.17
acc:0.01,0.02,1.02 gyro:0.00,0.00,0.00 angle:3.37,0.01,72.36
acc:0.01,0.02,1.02 gyro:0.00,0.00,0.00 angle:3.25,-0.02,72.54
mag:5372,1304,-4961
```

Note: Make sure the system's Bluetooth device supports BLE function

2.2 How to connect to a Bluetooth device with a specified name?

The format of the terminal input command:

```
sudo python3 wit_ble.py -n bluetooth
```

name

Example: Specify the search Bluetooth name as WT901BLE1234

```
sudo python3 wit_ble.py -n WT901BLE1234
```

Note that when there are multiple same Bluetooth names, one of them will be randomly connected

Note: Name search takes time, the default is about 4s to connect

2.3 How to specify the search time?

The format of the terminal input command:

```
sudo python3 wit_ble.py -t seconds
```

Example: Specify the search time as 5s

```
sudo python3 wit_ble.py -t 5
```

Note: When we set the search time to be too short, if there are too many Bluetooth devices at this time, some Bluetooth devices will not be able to search. Please specify the search time reasonably.

2.4 Combined with the function introduction of 2.2 and 2.3, we can specify a Bluetooth device to search for a specified time

Example: Specify to search for Bluetooth sensor WT901BLE1314 for 10 seconds

```
sudo python3 wit_ble.py -n WT901BLE1314 -t 10
```

2.5 How to connect to a bluetooth device by specifying a mac address?

How can we specify the connection when we know the address of the sensor's mac?

The format of the terminal input command:

```
sudo python3 wit_ble.py -m mac address
```

Example: Specify the connection mac address: d0:3e:7d:a4:b0:10

```
sudo python3 wit_ble.py -m d0:3e:7d:a4:b0:10
```