

## 7、Read data

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## 7.1 Experimental goals

This course mainly learns how to read the robot's battery power, servo angle, IMU data and other parameters.

## 7.2 Experiment preparation

The functions of the Muto robot Python library involved in this course are as follows:

**read\_version():** Read the underlying firmware version number. If the read is successful, the version number will be returned. If the read fails, None will be returned.

**read\_battery(voltage=True):** Read the battery power. The optional parameter voltage=True returns the voltage value, and voltage=False returns the battery percentage.

**read\_motor():** Read eighteen servo angle values. An array is returned if the read is successful, and None is returned if the read fails.

**read\_leg(leg\_id):** Read the angle of the servo on a certain leg. The value range of the parameter leg\_id is [1-6], which means leg1~leg6. An array is returned if the read is successful, and None is returned if the read fails.

**read\_IMU():** Read the angle after IMU fusion. If the reading is successful, an array [roll, pitch, yaw, temp] will be returned. If the reading fails, None will be returned.

**read\_IMU\_Raw():** Read the original data of the IMU. If the reading is successful, an array [accX, accY, accZ, gyroX, gyroY, gyroZ, magX, magY, magZ] will be returned. If the reading fails, None will be returned.

## 7.3 Experiment procedure

Open the jupyterLab client and find the code path:

```
muto/Samples/Control/7.read_data.ipynb
```

Read and print the version number:

```
version = g_bot.read_version()
print("version:", version)
```

Read and print battery voltage:

```
battery = g_bot.read_battery()
print("battery:%.1fV" % battery)
```

Read and print 18 servo angle values. Since the servo is subject to factors such as pressure and conversion accuracy, there may be a certain error between the read angle and the actual angle. A deviation of  $\pm 3^\circ$  from the actual angle is normal.

```
angle = g_bot.read_motor()
print("angle:", angle)
```

Read and print the three servo angles on leg 1. Since the servo will be subject to factors such as pressure and conversion accuracy, there may be a certain error between the read angle and the actual angle. A deviation of  $\pm 3^\circ$  from the actual angle is normal.

```
leg_id = 1
leg_angle = g_bot.read_leg(leg_id)
print("leg_angle:", leg_angle)
```

Read and print the IMU fused data:

```
imu = g_bot.read_IMU()
print("imu:", imu)
```

Read and print IMU raw data:

```
imu_raw = g_bot.read_IMU_Raw()
print("imu_raw:", imu_raw)
```

## 7.4 Experiment summary

Example of reading the battery voltage value. If you need to read the battery percentage, you can pass the parameter False.

```
] battery = g_bot.read_battery()
print("battery:%.1fV" % battery)

battery:7.6V
```

Example of reading the angle values of 18 servos:

```
: angle = g_bot.read_motor()
print("angle:", angle)

angle: [0, -36, -20, 0, -36, -21, 0, -36, -21, -1, -36, -20, -1, -36, -20, 0, -36, -20]
```

Example of reading the angle after IMU fusion:

```
imu = g_bot.read_IMU()
print("imu:", imu)

imu: [-0.42, -0.47, -7.49, 20]
```