Lab05

Marker(測距離) & Tello EDU

安裝套件

pip install opencv-contrib-python==**4.4.0.46**

pip install djitellopy

Marker Detection (50%)

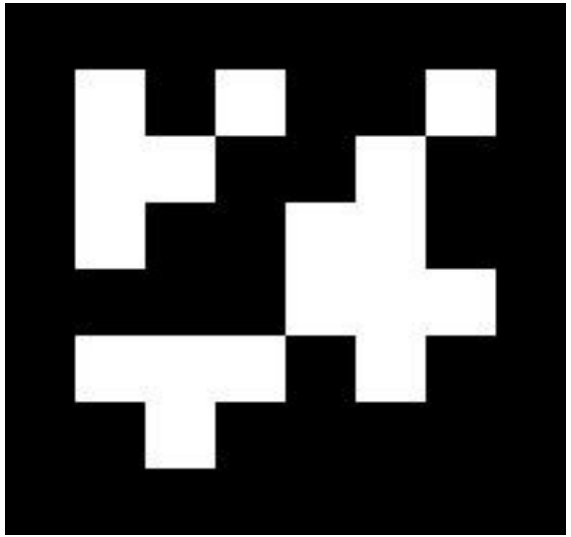
a. calibration

b. marker detection

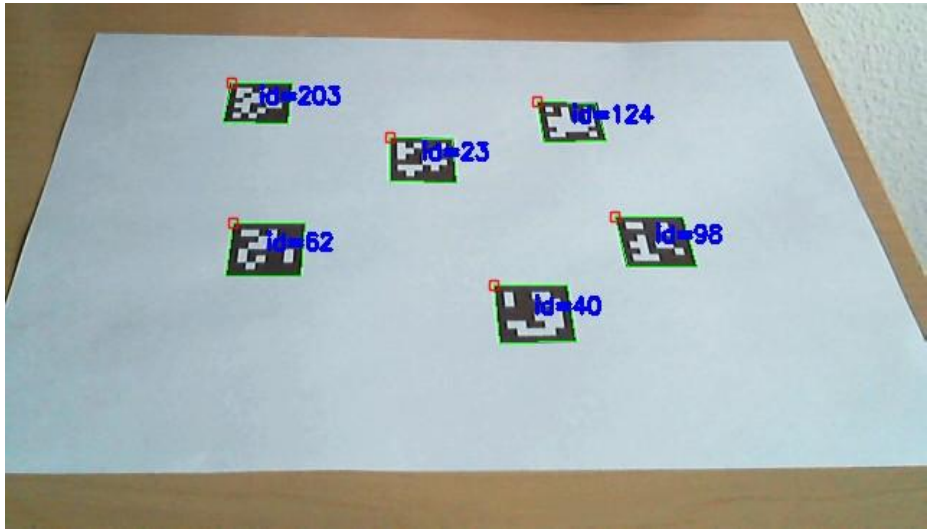
c. pose estimation

d. controlling

Marker Detection (50%)



aruco marker



marker detection

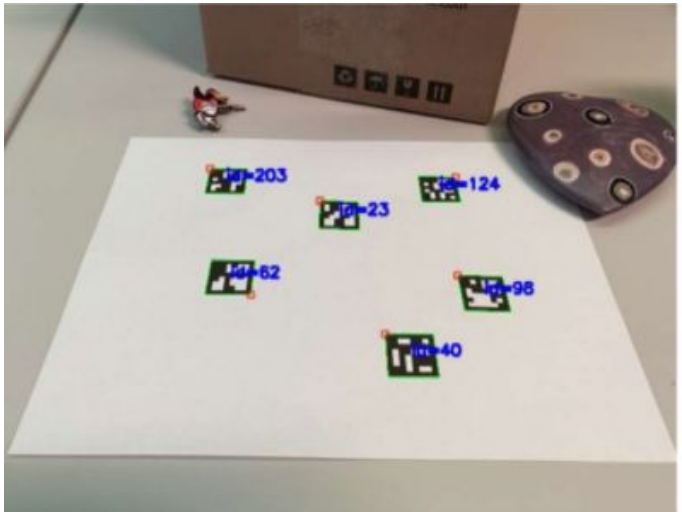
Marker Detection (50%)

 # Load the predefined dictionary
dictionary = cv2.aruco.Dictionary_get(cv.aruco.DICT_6X6_250)

 # Initialize the detector parameters using default values
parameters = cv2.aruco.DetectorParameters_create()
The list of parameters that can be adjusted including the adaptive threshold values can be found **here**

Marker Detection (50%)

```
# Detect the markers in the image
markerCorners, markerIds, rejectedCandidates =
cv2.aruco.detectMarkers(frame, dictionary, parameters=parameters)

frame = cv2.aruco.drawDetectedMarkers(frame,
markerCorners, markerIds)
```



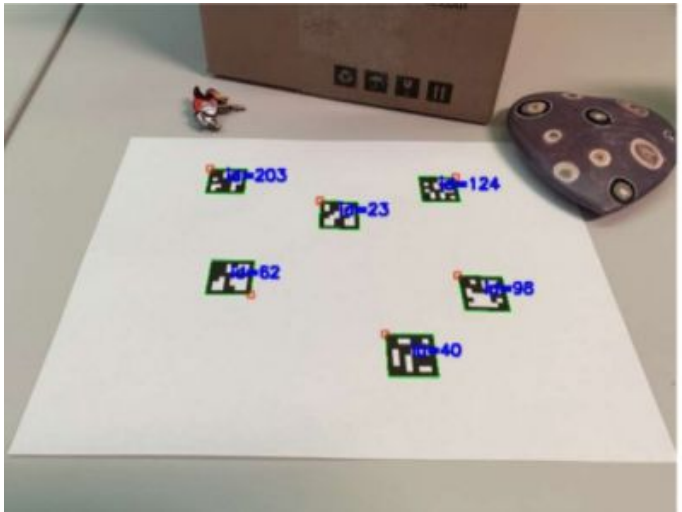
Marker Detection (50%)

#Pose estimation for single markers.

rvec, tvec, _objPoints = cv2.aruco.estimatePoseSingleMarkers(markerCorners, 15, intrinsic, distortion)

frame = cv2.aruco.drawAxis(frame, **intrinsic**, **distortion**, rvec, tvec, 0.1)

```
# Get the parameters of camera calibration
fs = cv2.FileStorage("calibrateCamera.xml", cv2.FILE_STORAGE_READ)
intrinsic = fs.getNode("intrinsic").mat()
distortion = fs.getNode('distortion').mat()
```

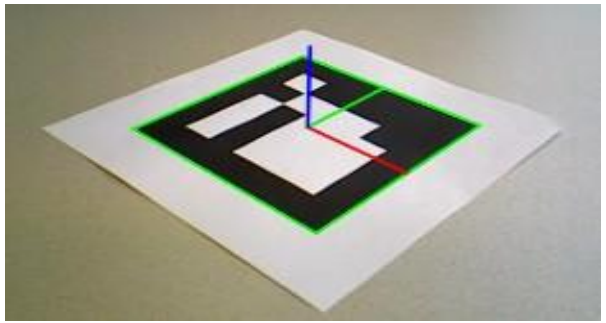


Marker Detection (50%)

a. calibrate the drone camera

b. marker detection by drone camera

c. pose estimation



x: 10.3478

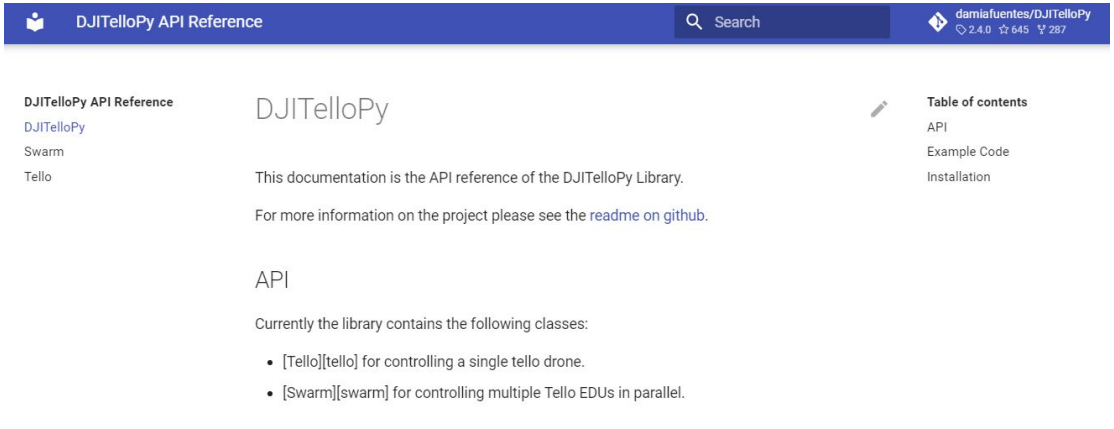
y: 21.5618

z: 3.9908

Tello EDU (50%)

djitellopy

djitellopy



DJITelloPy API Reference

installation:
pip install djitellopy

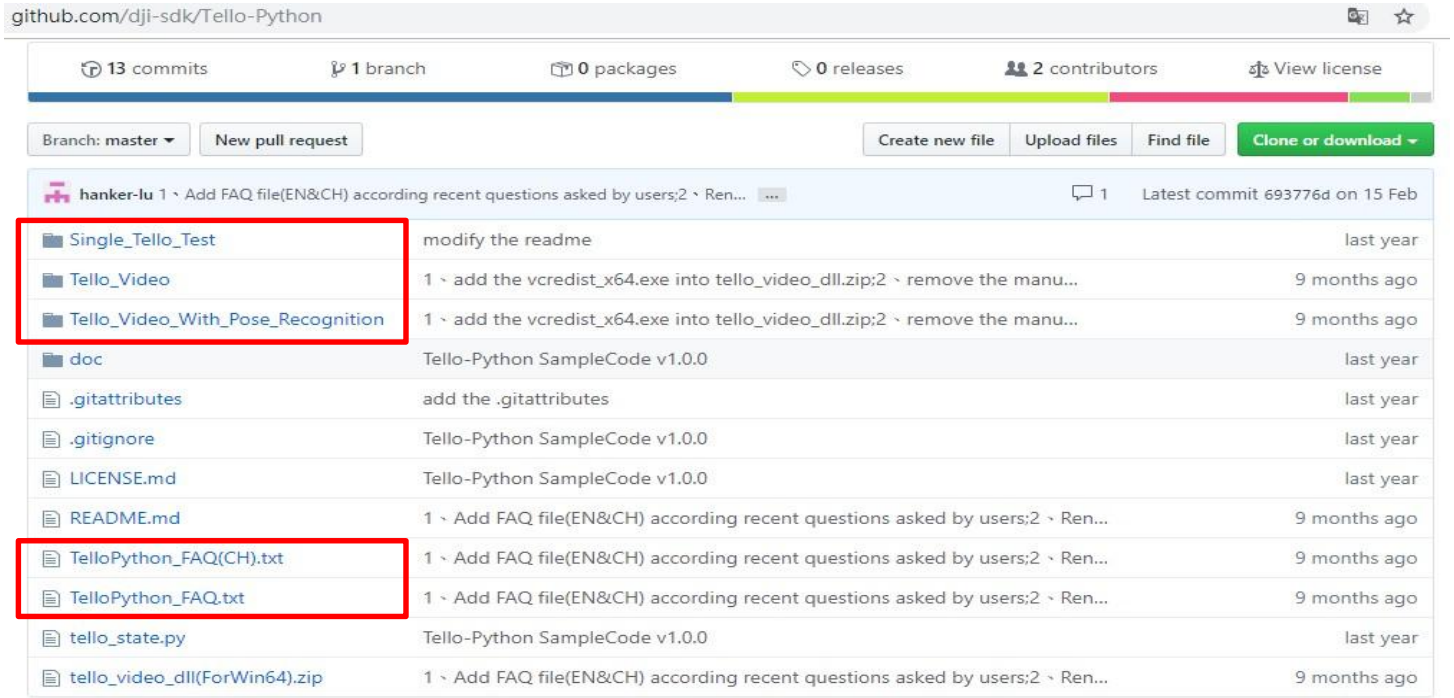
設備介紹

配件		數量
	飛行器	× 1
	螺旋槳（對）	× 4
	槳葉保護罩（套）	× 1
	電池	× 1
	Micro USB 傳輸線	× 1
	螺旋槳拆卸工具	× 1
	挑戰卡	× 4

電池管家

官方範例程式

- https://github.com/dji-sdk/Tello-Python

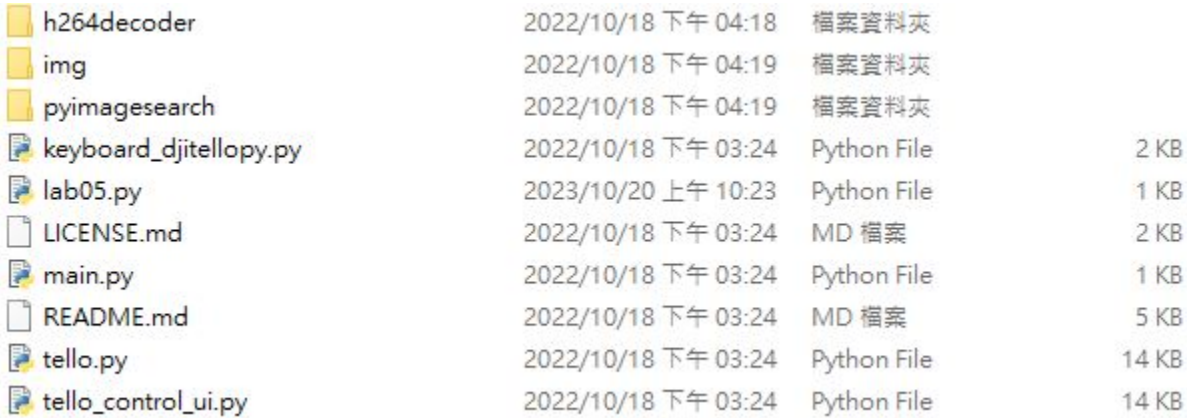


官方範例程式：Tello-Video

- 第一步。打開Tello無人機，並透過Wi-Fi將筆電連接到Tello

官方範例程式:執行 Tello-Video

- 第一步。打開Tello無人機，並透過Wi-Fi將筆電連接到Tello



取像控制

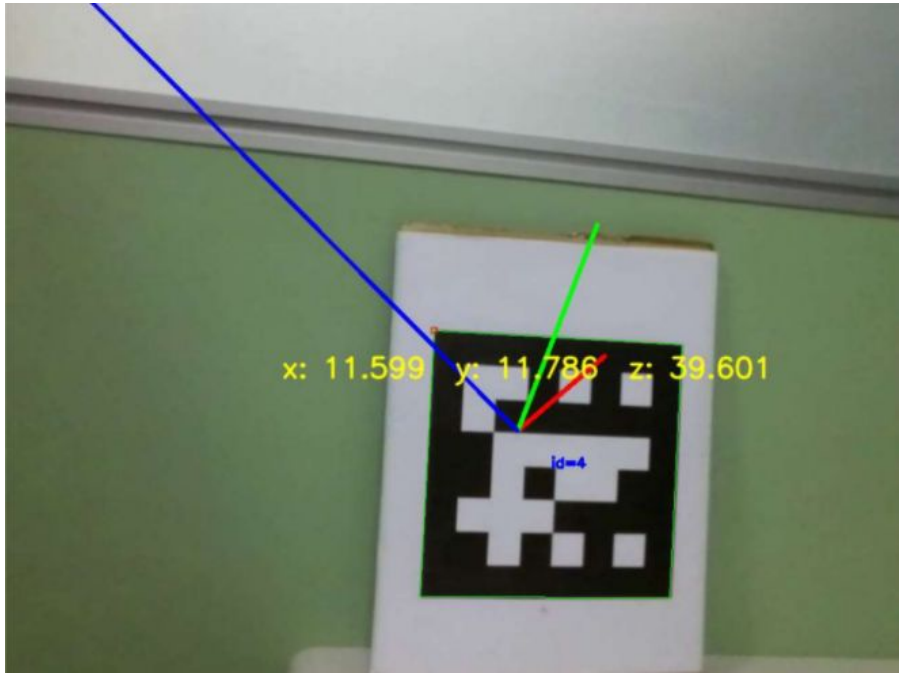
在Tello_Video資料夾內

放入lab05.py

```python
import cv2
import numpy as np
import time
import math
from djitellopy import Tello
from pyimagesearch.pid import PID

def main():
    # Tello
    drone = Tello()
    drone.connect()
    #time.sleep(10)
    drone.streamon()
    frame_read = drone.get_frame_read()


    while True:
        frame = frame_read.frame

        cv2.imshow("drone", frame)
        key = cv2.waitKey(33)

    #cv2.destroyAllWindows()



if __name__ == '__main__':
    main()
```

測距離

利用cv2.putText()將位置放上去



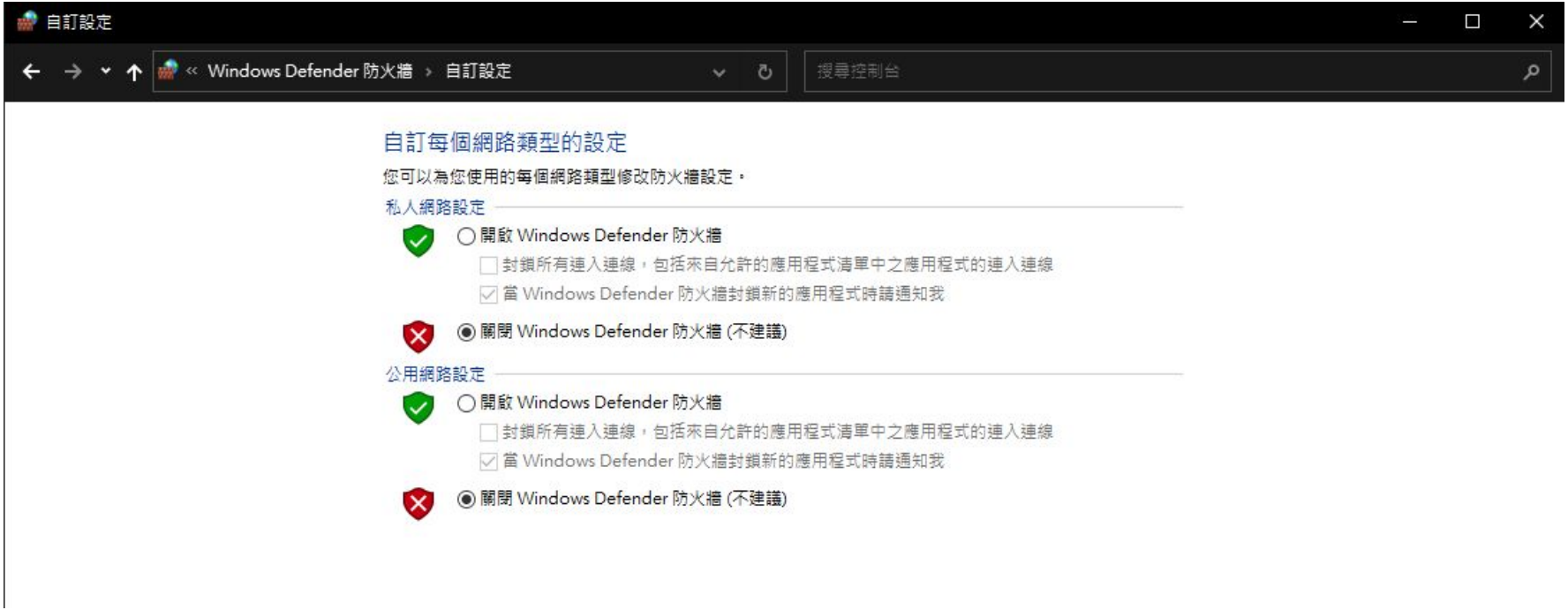
測距離

若找不到aruco module

pip install opencv-contrib-python

```
(cvdronelab) C:\Users\raymo>pip list |findstr opencv
opencv-contrib-python 4.4.0.46
opencv-python         4.4.0.46
```

若無人機無法取像，嘗試關閉防火牆 飛完記得打開



注意

本週不要讓無人機起飛!!!!

起飛的那組就當作這週作業未完成