YOLOv8 環境的建置

1. 套件安裝
   i. anaconda 軟體的下載網址，然後安裝 anaconda 軟體。
      https://www.anaconda.com/download
   ii. conda 環境建立，使用 python 3.8
      conda create --name baiV9 python=3.8
   iii. 取得 nvidia 版本的指，cmd -> **nvidia-smi**
      (感覺以下要去裝的 pytorch 版本跟下面框框這 11.6 沒有關係)

```
(baiV7) D:\PC_space\baiV7>nvidia-smi
Mon Jul 17 01:39:53 2023
+-----------------------------------------------------------------------------+
| NVIDIA-SMI 512.78       Driver Version: 512.78       CUDA Version: 11.6     |
|-------------------------------+----------------------+----------------------+
| GPU  Name            TCC/WDDM | Bus-Id        Disp.A | Volatile Uncorr. ECC |
| Fan  Temp  Perf  Pwr:Usage/Cap|         Memory-Usage | GPU-Util  Compute M. |
|                               |                      |               MIG M. |
|===============================+======================+======================|
|   0  NVIDIA RTX A4000   WDDM  | 00000000:01:00.0  On |                  Off |
| 41%   42C    P8    10W / 140W |    362MiB / 16376MiB |      9%      Default |
|                               |                      |                  N/A |
+-------------------------------+----------------------+----------------------+
|   1  NVIDIA RTX A4000   WDDM  | 00000000:02:00.0 Off |                  Off |
| 41%   42C    P8     8W / 140W |    362MiB / 16376MiB |      1%      Default |
|                               |                      |                  N/A |
+-------------------------------+----------------------+----------------------+

+-----------------------------------------------------------------------------+
| Processes:                                                                  |
|  GPU   GI   CI        PID   Type   Process name                  GPU Memory |
|        ID   ID                                                   Usage      |
|=============================================================================|
|    0   N/A  N/A      1020    C+G   ...bbwe\Microsoft.Photos.exe    N/A      |
|    0   N/A  N/A      2080    C+G   ...lPanel\SystemSettings.exe    N/A      |
|    0   N/A  N/A      2372    C+G   ...wekyb3d8bbwe\Video.UI.exe    N/A      |
|    0   N/A  N/A      8488    C+G   C:\Windows\explorer.exe         N/A      |
|    0   N/A  N/A      9468    C+G   ...artMenuExperienceHost.exe    N/A      |
|    0   N/A  N/A      9720    C+G   ...2txyewy\TextInputHost.exe    N/A      |
|    0   N/A  N/A     10060    C+G   ...5n1h2txyewy\SearchApp.exe    N/A      |
|    0   N/A  N/A     11400    C+G   ...oft\OneDrive\OneDrive.exe    N/A      |
|    0   N/A  N/A     11804    C+G   ...e\PhoneExperienceHost.exe    N/A      |
|    0   N/A  N/A     12356    C+G   ...8wekyb3d8bbwe\Cortana.exe    N/A      |
|    0   N/A  N/A     12636    C+G   ...me\Application\chrome.exe    N/A      |
|    1   N/A  N/A      1020    C+G   ...bbwe\Microsoft.Photos.exe    N/A      |
|    1   N/A  N/A      2080    C+G   ...lPanel\SystemSettings.exe    N/A      |
|    1   N/A  N/A      2372    C+G   ...wekyb3d8bbwe\Video.UI.exe    N/A      |
|    1   N/A  N/A      8488    C+G   C:\Windows\explorer.exe         N/A      |
|    1   N/A  N/A      9468    C+G   ...artMenuExperienceHost.exe    N/A      |
|    1   N/A  N/A      9720    C+G   ...2txyewy\TextInputHost.exe    N/A      |
|    1   N/A  N/A     10060    C+G   ...5n1h2txyewy\SearchApp.exe    N/A      |
|    1   N/A  N/A     11400    C+G   ...oft\OneDrive\OneDrive.exe    N/A      |
|    1   N/A  N/A     11804    C+G   ...e\PhoneExperienceHost.exe    N/A      |
|    1   N/A  N/A     12356    C+G   ...8wekyb3d8bbwe\Cortana.exe    N/A      |
|    1   N/A  N/A     12636    C+G   ...me\Application\chrome.exe    N/A      |
+-----------------------------------------------------------------------------+
```

iv. 依序安裝以下的套件：

- ~~**pip install opencv-python pandas ipython psutil**~~
- ~~**pip install PyYAML PyQt5**~~
- **pip install tqdm matplotlib seaborn tensorboard==2.12.0**
- **pip install ultralytics**
- Torch 與 cuXXX: 進入此網站，找到對應的版本 ->

https://pytorch.org/get-started/previous-versions/

v1.12.0

Conda

OSX

```
# conda
conda install pytorch==1.12.0 torchvision==0.13.0 torchaudio==0.12.0 -c pytorch
```

Linux and Windows

```
# CUDA 10.2
conda install pytorch==1.12.0 torchvision==0.13.0 torchaudio==0.12.0 cudatoolkit=10.2 -c pytorch
# CUDA 11.3
conda install pytorch==1.12.0 torchvision==0.13.0 torchaudio==0.12.0 cudatoolkit=11.3 -c pytorch
# CUDA 11.6
conda install pytorch==1.12.0 torchvision==0.13.0 torchaudio==0.12.0 cudatoolkit=11.6 -c pytorch -c conda-fo
# CPU Only
conda install pytorch==1.12.0 torchvision==0.13.0 torchaudio==0.12.0 cpuonly -c pytorch
```

Wheel

OSX

```
pip install torch==1.12.0 torchvision==0.13.0 torchaudio==0.12.0
```

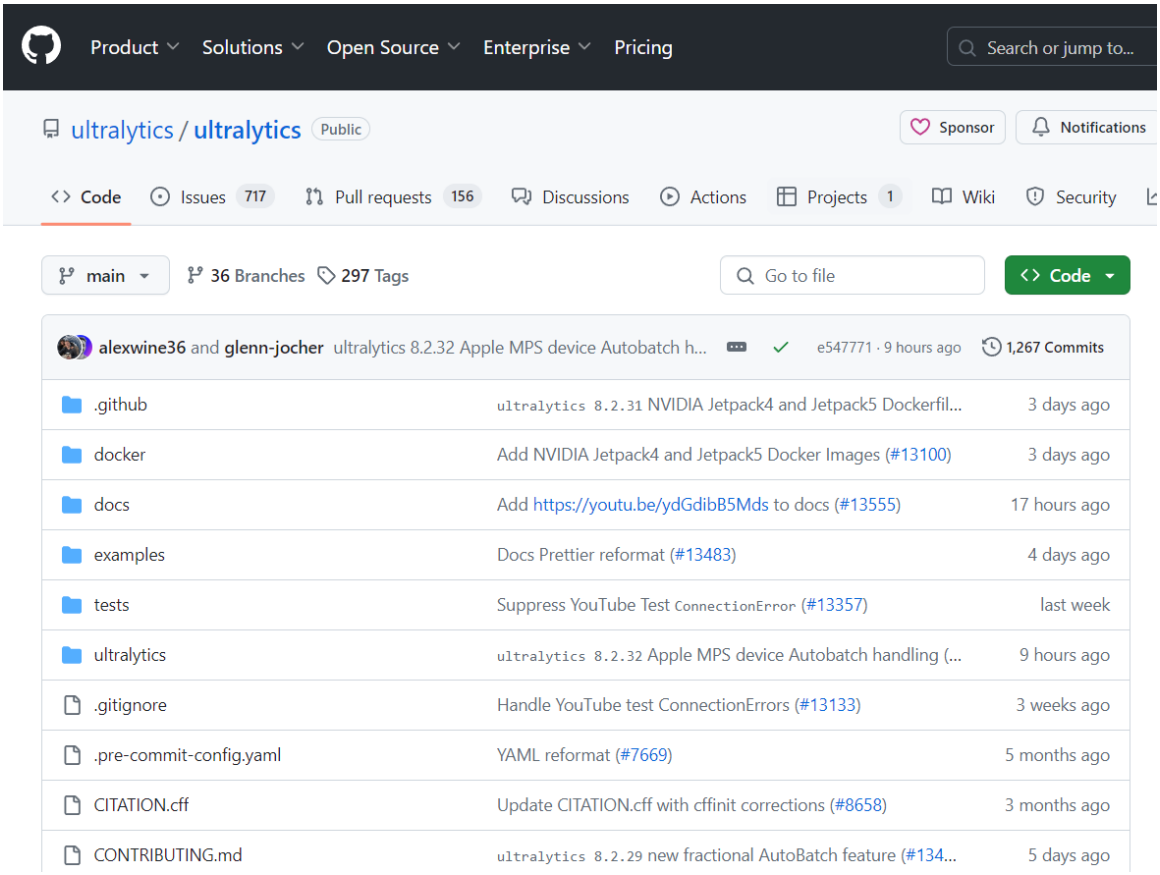
Linux and Windows

```
# ROCM 5.1.1 (Linux only)
pip install torch==1.12.0+rocm5.1.1 torchvision==0.13.0+rocm5.1.1 torchaudio==0.12.0 --extra-index-url  http
# CUDA 11.6
pip install torch==1.12.0+cu116 torchvision==0.13.0+cu116 torchaudio==0.12.0 --extra-index-url https://downl
# CUDA 11.3
pip install torch==1.12.0+cu113 torchvision==0.13.0+cu113 torchaudio==0.12.0 --extra-index-url https://downl
# CUDA 10.2
pip install torch==1.12.0+cu102 torchvision==0.13.0+cu102 torchaudio==0.12.0 --extra-index-url https://downl
# CPU only
pip install torch==1.12.0+cpu torchvision==0.13.0+cpu torchaudio==0.12.0 --extra-index-url https://download
```

```
pip install torch==1.12.0+cu116 torchvision==0.13.0+cu116
torchaudio==0.12.0 --extra-index-url
https://download.pytorch.org/whl/cu116
```

2. YOLOv8 下載的地方

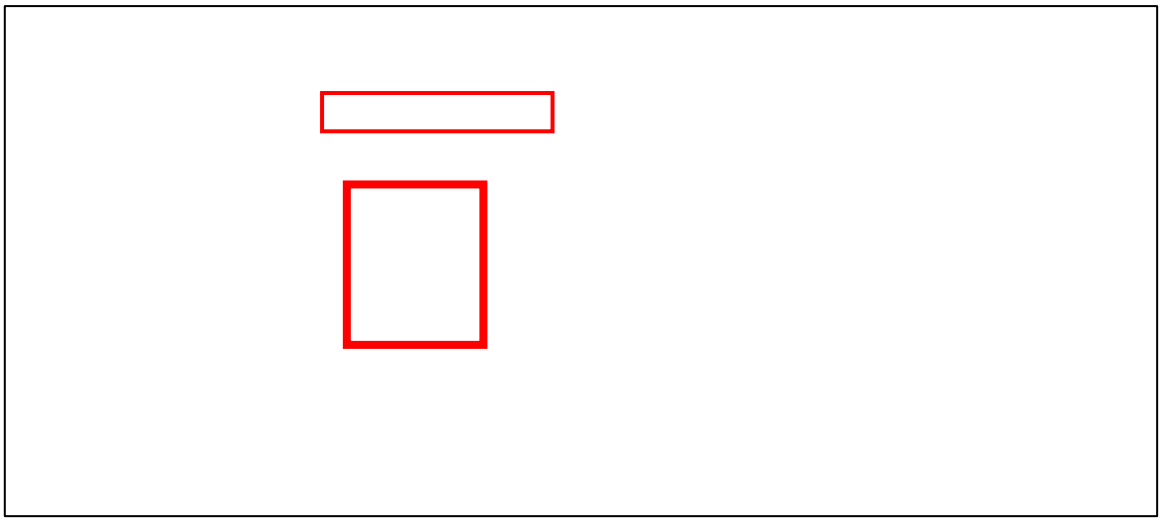
   https://github.com/ultralytics/ultralytics



3. YOLOv7 目錄結構 (這部分還未修改)

```
yolov7-main folder
    |-- cfg
    |   |-- baseline
    |   |-- deploy
    |   |-- training
    |   |   |-- fruits.yaml
    |-- data
    |   |-- fruits.yaml
    |   |-- hyp.scratch.p5.paml
    |   |-- hyp.scratch.p6.paml
    |-- datasets(EX: fruits)
    |   |-- images
    |   |   |-- train
    |   |   |   |-- *.jpg
    |   |   |   |-- *.jpg
    |   |   |   |   ... ...
    |   |   | -- val
    |   |   |   |-- *.jpg
    |   |   |   |-- *.jpg
    |   |   |   |   ... ...
    |   |-- labels
    |   |   |-- train
    |   |   |   |-- *.txt
    |   |   |   |-- *.txt
    |   |   |   |   ... ...
    |   |   |-- val
    |   |   |   |-- *.txt
    |   |   |   |-- *.txt
    |   |   |   |   ... ...
    |   |-- train.txt
    |   |-- val.txt
    |-- runs
    |   |-- detect
    |   |-- train
    |-- detect.py
    |-- train.py
    |-- test.py
```

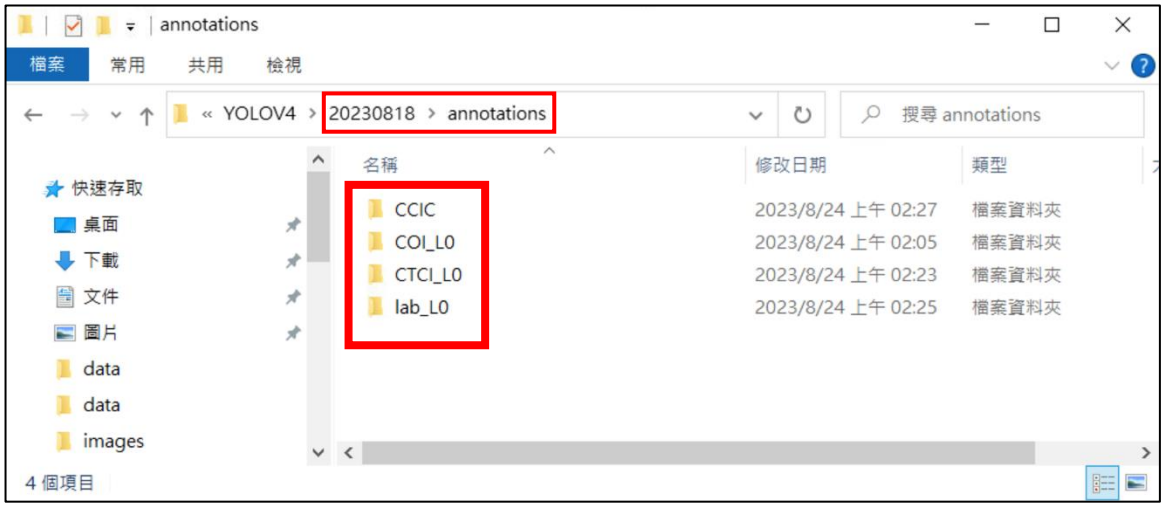
4. 訓練前的準備步驟：(這部分還未修改)



流程圖

i. 在 D 槽作業，標註完成的資料夾內容複製至新創的資料夾。

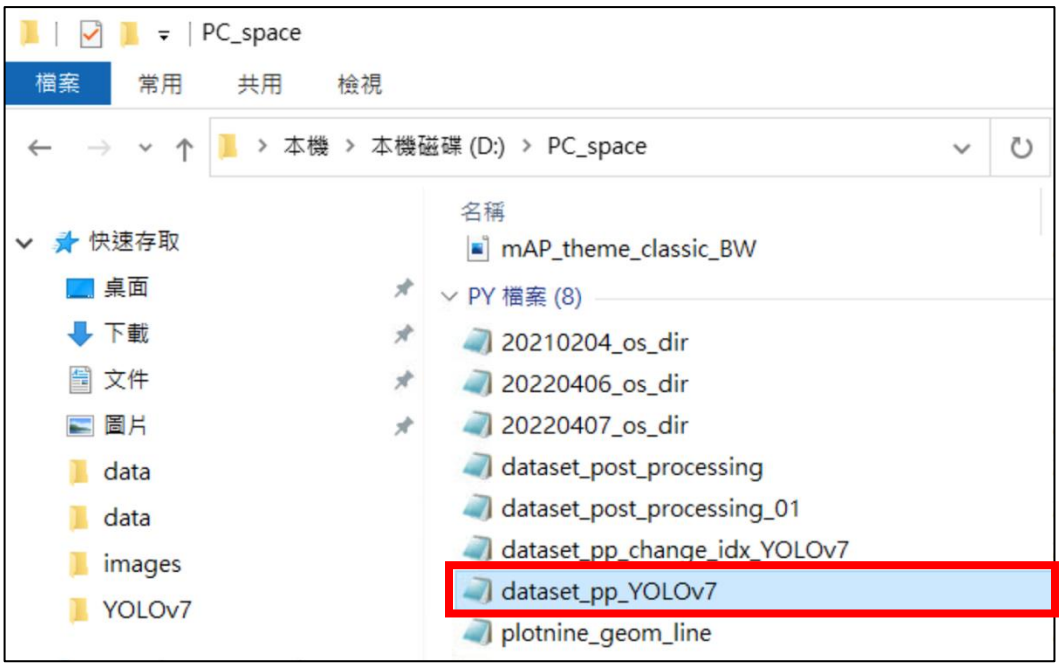
- 複製資料夾來源位置 -> D:\PC_space\images_lab\YOLOV4\20220615**annotations**
- 新創的資料夾範例 ->



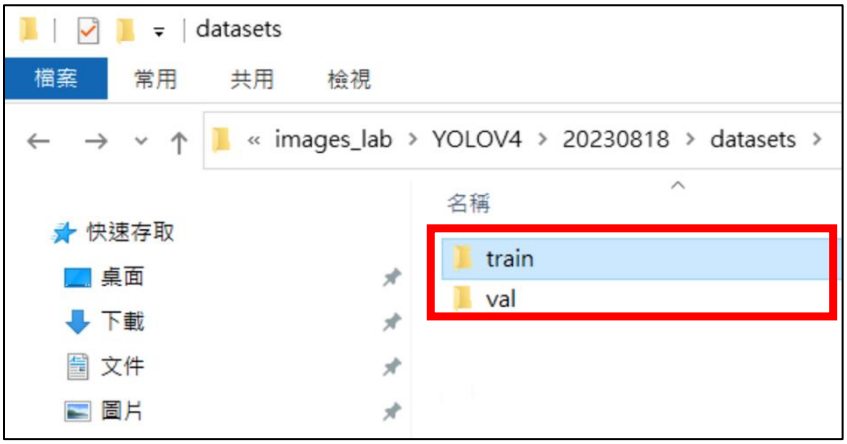
- continue

ii. 在 D 槽作業，建立 datasets 資料夾，包含 train 與 val 資料夾。

- datasets 資料夾需要手動先建立。
- 執行程式 -> **dataset_pp_YOLOv7.py**



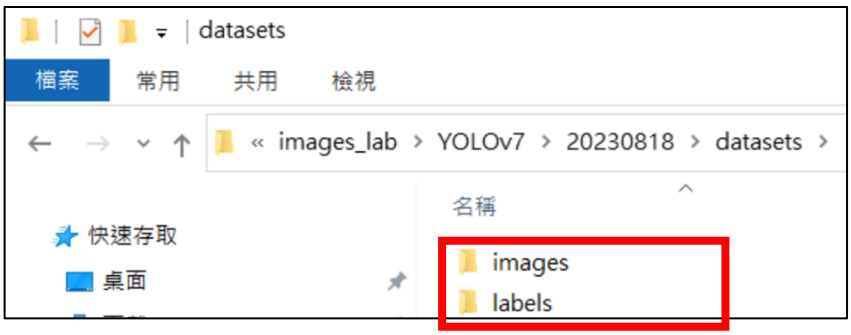
- 在 D 槽作業，產生的結果範例：



- continue

iii. 在 D 槽作業，複製產生的 **datasets** 資料夾內容至 YOLOv7 資料夾。

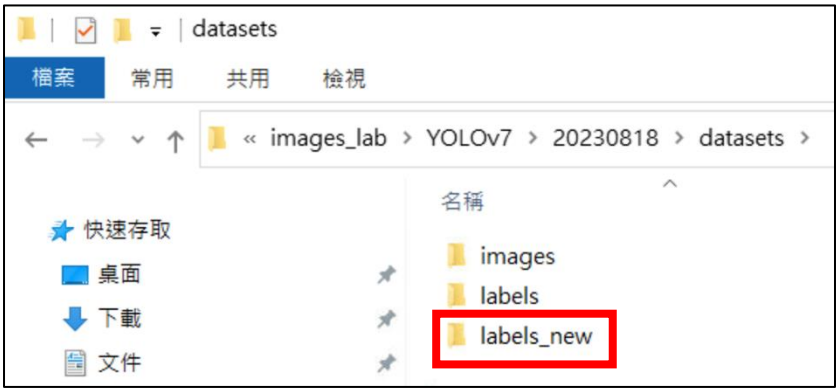
- 目標位置 -> D:\PC_space\images_lab\YOLOv7
- 結果範例：



- continue

iv. 在 D 槽作業，執行 dataset_pp_change_idx_YOLOv7 程式，將 class index 重新排列，並且產生程式的執行 log 檔案。

- 程式位置 -> D:\PC_space
- 執行結果：



- Log 檔案的產生位置在 D:\PC_space，名稱範例為 20230818_lable_new_log。

v. 在 E 槽作業，將 **images** 與 **label_new** 資料夾內容複製到欲訓練的位置。

- 目標位置 -> E:\images_lab\YOLOv7
- 複製的內容為 **images** 與 **label_new**，其中 label_new 複製完成後，將其改名為 label，結果範例：

- continue

vi. 從 D 槽複製以下內容至 E 槽。

- cfg，來源位置 -> D:\PC_space\baiV7\yolov7\cfg\training，內容範例為 20230818_cfg_dd_0.yaml。
- cfg，目標位置 -> E:\baiV7\yolov7\cfg\training
- data，來源位置 -> D:\PC_space\baiV7\yolov7\data，內容範例為 20230818_data_dd_0.yaml。

- data，目標位置 -> E:\baiV7\yolov7\data
- 訓練圖片的 txt 紀錄檔案，來源位置，範例為 20230818_train.txt 與 20230818_val.txt -> D:\PC_space\baiV7\yolov7\deterioration_detection
- 訓練圖片的 txt 紀錄檔案，目標位置 -> E:\baiV7\yolov7**deterioration_detection**

vii. 刪除既有的***.cache** 檔案，範例為 20230818_train.cache 與 20230818_val.cache，這樣才不會接續上次的訓練。

viii. 以上為訓練前的準備步驟。

5. Command for detect
   yolo predict model=yolov8n.pt source='https://ultralytics.com/images/bus.jpg'

6. Command for training
   yolo detect train device=0
   data=./ultralytics/cfg/datasets/20240613_data_dd_04578.yaml
   model=./ultralytics/cfg/models/v8/yolov8l.yaml epochs=200 imgsz=640
   project=runs/train name=yolov8_l_dd_dataset2

7. 訓練時用 tensorboard 看狀態，指令以及輸入到瀏覽器的網址：
   tensorboard --logdir runs/train -> dos cmd，要到 YOLOv8 的資料夾位置。
   EX: (baiV8) E:\baiV8\ultralytics> tensorboard --logdir ./runs/train

   http://localhost:6006 -> chrome

8. Continue

9. Continue