How to run PPE Detection code on PC

* Create directory called PPE\_Detection from the command prompt by using the command

*mkdir <base path>:\PPE\_Detection*

* Navigate to the created directory and clone the github repo using the commands

*cd PPE\_Detection*

*git clone* [*https://github.com/WongKinYiu/yolov7.git*](https://github.com/WongKinYiu/yolov7.git)

* The above step should have created a yolov7 folder in the directory. Navigate to that folder using the command

*cd yolov7*

* Run pip install requirements file by using the following command

*pip install -r requirements.txt*

* Download the annotated PPE detection dataset from roboflow using the command

*curl -L "*[*https://app.roboflow.com/ds/njY3OerZ4J?key=c6tNVrdcju*](https://app.roboflow.com/ds/njY3OerZ4J?key=c6tNVrdcju)*" > roboflow.zip; unzip roboflow.zip; rm roboflow.zip*

* Download the model training weights file from the github repo using the command

*curl -LJO* [*https://github.com/WongKinYiu/yolov7/releases/download/v0.1/yolov7\_training.pt*](https://github.com/WongKinYiu/yolov7/releases/download/v0.1/yolov7_training.pt)

* Install tar using the link

<http://gnuwin32.sourceforge.net/packages/gtar.htm>

* Create a folder in the current directory by using the command

*mkdir roboflow*

* Unzip the roboflow zipped folder downloaded in step 5 using the command

*tar -xf C:\MACS-G\PPE\_Detection\yolov7\roboflow.zip -C C:\MACS-G\PPE\_Detection\yolov7\roboflow*

* Copy the “test”, ‘train’, and ‘valid’ folders to C:\MACS-G\PPE\_Detection folder by using the command

*mkdir C:\MACS-G\PPE\_Detection\test*

*xcopy /s C:\MACS-G\PPE\_Detection\yolov7\roboflow\test C:\MACS-G\PPE\_Detection\test*

Do the same for the train and valid folders as well

* Create a copy of the data.yaml file in the roboflow folder using the command

*copy C:\MACS-G\PPE\_Detection\yolov7\roboflow\data.yaml C:\MACS-G\PPE\_Detection\yolov7\data\custom.yaml*

* We have to update the number of classes in the yolov7.yaml file by using the command

*powershell -Command "(Get-Content C:\MACS-G\PPE\_Detection\yolov7\cfg\training\yolov7.yaml) -replace 'nc: 80', 'nc: 13' -replace 'depth\_multiple: 1.0', 'depth\_multiple: 1.0' -replace 'width\_multiple: 1.0', 'width\_multiple: 1.0' | Set-Content C:\MACS-G\PPE\_Detection\yolov7\cfg\training\yolov7.yaml"*

**NOTE: the value ‘nc: 13’ is the one value you will have to change in the batch file if the number of classes being detected changes.**



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| Parameter | Meaning |
| BatchSize | The amount of data that can be processed simultaneously and it should be in the power of two  Batchsize beyond 32 is unrealistic because if the batch size is above 32 it consumes a lot of memory.  We can also set the batchsize as 4, but the training time will increase as we reduce the batchsize  Ideally set this to 16 |
| Image Size | As we are doing transfer learning in this project, the YOLOv7 model is trained by setting the default image size as 640 640, If we change the imagesize, the accuracy might be compromised |
| Workers | The more the workers the faster the training will be but it will take more memory |
| Hyp | hyp--> hyperparameter are small parameters that can be changed inside a model and they affect the performance of the model and they can be accessed using a .yaml file |

* Run the python training script by using the command (NOTE: run this only on PCs with a GPU or else the execution will be really slow)

*~~python train.py --workers 0 --batch 16 --epochs 120 --img 640 640 --cfg cfg\training\yolov7.yaml --data data\custom.yaml --hyp data\hyp.scratch.p5.yaml --weights yolov7\_training.pt --name PPE\_Detection\_yolov7 --device cpu~~*

*python train.py --workers 0 --batch-size 4 --device cpu --data data\custom.yaml --img 640 640 --cfg cfg\training\yolov7.yaml --weights yolov7\_training.pt --name PPE-Detection --hyp data\hyp.scratch.custom.yaml --epochs 300*

OR

run the notebook PPE\_Detection\_YOLOv7+(1).ipynb in google colab and move the weights to the yolov7 local folder

* To continue an unfinished training

*python train.py --workers 0 --batch-size 4 --device 0 --data data\custom.yaml --img 640 640 --cfg cfg\training\yolov7.yaml --weights yolov7\_training.pt --name PPE-Detection --hyp data\hyp.scratch.custom.yaml --epochs 300 --resume*

**YOLOv8 Version**

* *mkdir C:\MACS-G\PPE\_Detection\_yv8*
* *cd C:\MACS-G\PPE\_Detection\_yv8*
* *pip install ultralytics==8.0.0*
* *mkdir C:\MACS-G\PPE\_Detection\_yv8\datasets*
* *cd C:\MACS-G\PPE\_Detection\_yv8\datasets*
* *pip install roboflow*
* *curl -L "*[*https://app.roboflow.com/ds/kgJ90KkRNh?key=6DZgraWn3Z*](https://app.roboflow.com/ds/kgJ90KkRNh?key=6DZgraWn3Z)*" > roboflow.zip; unzip roboflow.zip; rm roboflow.zip*
* *tar -xf C:\MACS-G\PPE\_Detection\_yv8\datasets\roboflow.zip -C C:\MACS-G\PPE\_Detection\_yv8\datasets*
* *yolo task=detect mode=train model=yolov8m.pt data="C:\MACS-G\PPE\_Detection\_yv8\datasets\data.yaml" epochs=100 imgsz=640 device=0*
* *yolo task=detect mode=val model="C:\MACS-G\PPE\_Detection\_yv8\datasets\runs\detect\train12\weights\best.pt" data="C:\MACS-G\PPE\_Detection\_yv8\datasets\data.yaml"*
* *yolo task=detect mode=predict model="C:\MACS-G\PPE\_Detection\_yv8\datasets\runs\detect\train12\weights\best.pt" conf=0.25 source="C:\MACS-G\PPE\_Detection\_yv8\datasets\No PPE.jpg"*