Custom Training with YOLOv5

```
from google.colab import drive
drive.mount('/content/drive')
```

```
%cd drive/MyDrive/Project/Tracking
```

```
/content/drive/MyDrive/Project/Tracking
```

Step 1: Install Requirements

```
#clone YOLOv5 and
!git clone https://github.com/ultralytics/yolov5  # clone repo
%cd yolov5
%pip install -qr requirements.txt # install dependencies
%pip install -q roboflow
%pip install -q wandb

import torch
import os
from IPython.display import Image, clear_output  # to display images

print(f"Setup complete. Using torch {torch.__version__} ({torch.cuda.get_device_propert
```

```
Cloning into 'yolov5'...
remote: Enumerating objects: 13180, done.
remote: Total 13180 (delta 0), reused 0 (delta 0), pack-reused 13180
Receiving objects: 100% (13180/13180), 11.96 MiB | 7.84 MiB/s, done.
Resolving deltas: 100% (9168/9168), done.
/content/yolov5/yolov5
Setup complete. Using torch 1.11.0+cu113 (Tesla K80)
```

Dataset

```
from roboflow import Roboflow
rf = Roboflow(model_format="yolov5", notebook="ultralytics")
```

```
upload and label your dataset, and get an API KEY here: https://app.roboflow.com/?mo
```

```
# set up environment
os.environ["DATASET_DIRECTORY"] = "/content/datasets"
```

```
from roboflow import Roboflow
```

```
rf = Roboflow(api_key="Jk9USaGb7T5W0R8f0VUy")
project = rf.workspace("yolov5-deepsort-2kymo").project("yolov5-oxvbs")
dataset = project.version(4).download("yolov5")
```

```
loading Roboflow workspace...
loading Roboflow project...
Downloading Dataset Version Zip in /content/datasets/YOLOv5-4 to yolov5pytorch: 100%
Extracting Dataset Version Zip to /content/datasets/YOLOv5-4 in yolov5pytorch:: 100%
```

```
!wget https://github.com/ultralytics/yolov5/releases/download/v6.1/yolov5m.pt
```

```
--2022-05-05 14:50:07--  https://github.com/ultralytics/yolov5/releases/download/v6.1
Resolving github.com (github.com)... 140.82.121.3
Connecting to github.com (github.com)|140.82.121.3|:443... connected.
HTTP request sent, awaiting response... 302 Found
Location: https://objects.githubusercontent.com/github-production-release-asset-2e65b
--2022-05-05 14:50:07--  https://objects.githubusercontent.com/github-production-rele
Resolving objects.githubusercontent.com (objects.githubusercontent.com)... 185.199.10
Connecting to objects.githubusercontent.com (objects.githubusercontent.com)|185.199.1
HTTP request sent, awaiting response... 200 OK
Length: 42806829 (41M) [application/octet-stream]
Saving to: ‘yolov5m.pt’

yolov5m.pt          100%[===================>]  40.82M  18.7MB/s    in 2.2s

2022-05-05 14:50:10 (18.7 MB/s) - ‘yolov5m.pt’ saved [42806829/42806829]
```

Train Our Custom YOLOv5 model

- **img:** define input image size
- **batch:** determine batch size
- **epochs:** define the number of training epochs. (Note: often, 3000+ are common here!)
- **data:** Our dataset locaiton is saved in the `dataset.location`
- **weights:** specify a path to weights to start transfer learning from. Here we choose the generic COCO pretrained checkpoint.
- **cache:** cache images for faster training

```
%cd ../..
```

```
/content
```

```
import torch
torch.cuda.empty_cache()

!python yolov5/train.py --img 640 --batch -1 --epochs 50 --data datasets/YOLOv5-4/data.
```

```
                 all       1793     249025       0.96      0.879      0.949      0
```

```
      Epoch    gpu_mem       box       obj       cls    labels  img_size
```

```
 7/49     8.75G   0.05395    0.5371         0 1.305e+04       640: 100% 93/93
           Class     Images     Labels          P          R     mAP@.5 mAP@.5
             all       1793     249025      0.954      0.881      0.949      0

Epoch   gpu_mem       box       obj       cls    labels  img_size
 8/49     8.75G   0.05307    0.5315         0 1.252e+04       640: 100% 93/93
           Class     Images     Labels          P          R     mAP@.5 mAP@.5
             all       1793     249025      0.961      0.885      0.952      0

Epoch   gpu_mem       box       obj       cls    labels  img_size
 9/49     8.75G   0.05288    0.5338         0 1.396e+04       640: 100% 93/93
           Class     Images     Labels          P          R     mAP@.5 mAP@.5
             all       1793     249025      0.961      0.884      0.952      0

Epoch   gpu_mem       box       obj       cls    labels  img_size
10/49     8.75G   0.05243    0.5256         0 1.244e+04       640: 100% 93/93
           Class     Images     Labels          P          R     mAP@.5 mAP@.5
             all       1793     249025      0.966      0.888      0.955      0

Epoch   gpu_mem       box       obj       cls    labels  img_size
11/49     8.75G   0.05247    0.5216         0 1.222e+04       640: 100% 93/93
           Class     Images     Labels          P          R     mAP@.5 mAP@.5
             all       1793     249025      0.969      0.881      0.954       (

Epoch   gpu_mem       box       obj       cls    labels  img_size
12/49     8.75G    0.0518    0.5205         0 1.313e+04       640: 100% 93/93
           Class     Images     Labels          P          R     mAP@.5 mAP@.5
             all       1793     249025      0.963      0.895      0.958      0

Epoch   gpu_mem       box       obj       cls    labels  img_size
13/49     8.75G   0.05164    0.5187         0 1.399e+04       640: 100% 93/93
           Class     Images     Labels          P          R     mAP@.5 mAP@.5
             all       1793     249025      0.964      0.896      0.959      0

Epoch   gpu_mem       box       obj       cls    labels  img_size
14/49     8.75G    0.0514    0.5164         0 1.074e+04       640: 100% 93/93
           Class     Images     Labels          P          R     mAP@.5 mAP@.5
             all       1793     249025       0.97      0.891      0.959      0

Epoch   gpu_mem       box       obj       cls    labels  img_size
15/49     8.75G    0.0514    0.5125         0 1.161e+04       640: 100% 93/93
           Class     Images     Labels          P          R     mAP@.5 mAP@.5
             all       1793     249025      0.971       0.89      0.958      0

Epoch   gpu_mem       box       obj       cls    labels  img_size
16/49     8.75G   0.05128     0.513         0 1.259e+04       640: 100% 93/93
           Class     Images     Labels          P          R     mAP@.5 mAP@.5
             all       1793     249025      0.969      0.896       0.96      0

Epoch   gpu_mem       box       obj       cls    labels  img_size
17/49     8.75G   0.05089    0.5088         0 1.312e+04       640: 100% 93/93
           Class     Images     Labels          P          R     mAP@.5 mAP@.5
             all       1793     249025      0.967      0.897      0.961      0
```