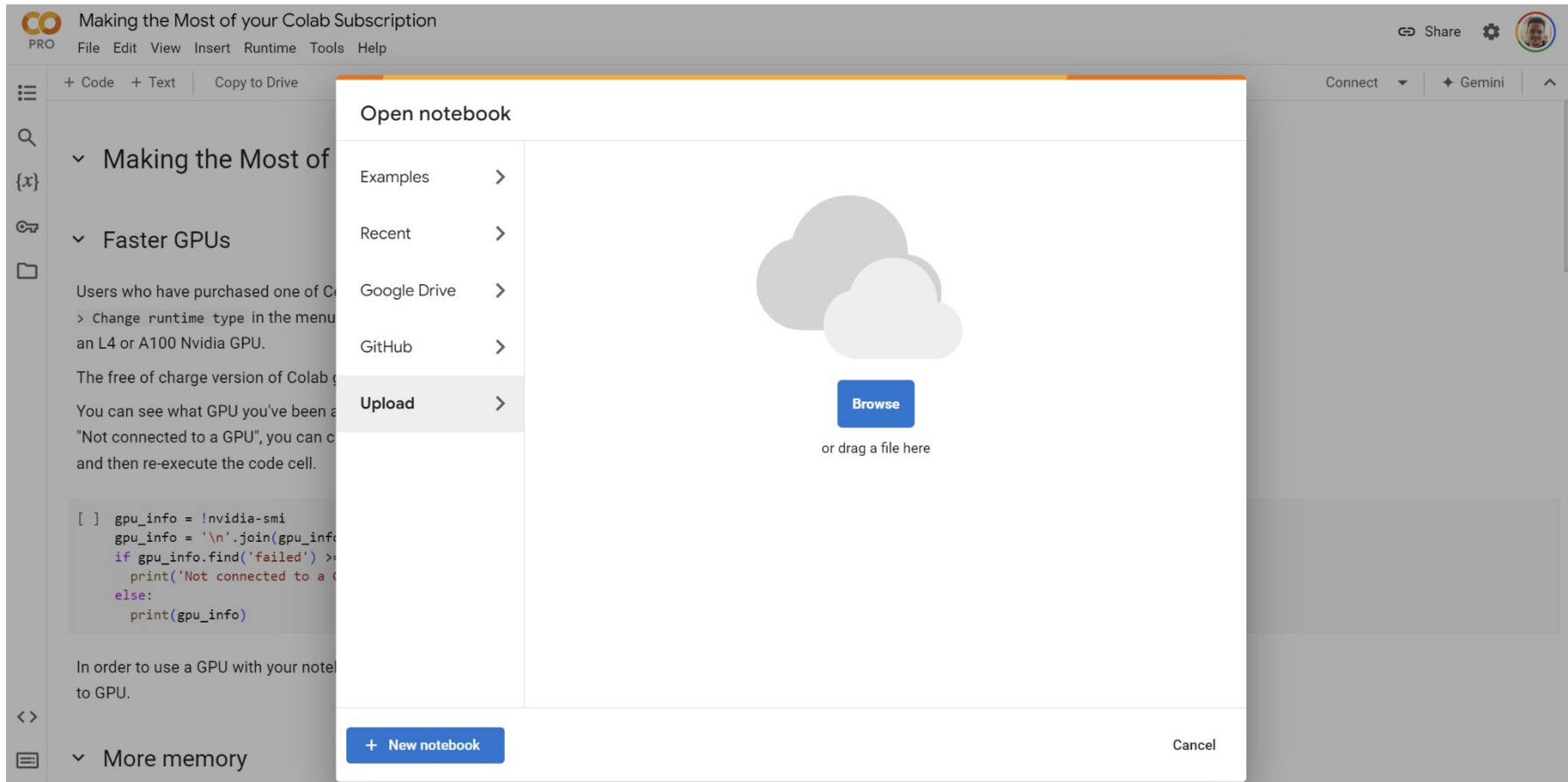


CS3 Research Experience for Teachers (RET)

Colab YOLOv8 Training Tutorial

Dr. Mehmet Kerem Turkcan

Enter the Website: <https://colab.research.google.com/> and press "Upload"



The screenshot displays the Google Colab web interface. At the top, a banner reads "Making the Most of your Colab Subscription" with a "PRO" label. The main menu includes "File", "Edit", "View", "Insert", "Runtime", "Tools", and "Help". On the right, there are "Share", "Settings", and a user profile icon. The left sidebar shows a file explorer with a notebook titled "Making the Most of" and a section "Faster GPUs" containing text about GPU usage and a code cell. A modal dialog titled "Open notebook" is centered on the screen. It features a list on the left with options: "Examples", "Recent", "Google Drive", "GitHub", and "Upload" (which is highlighted). The main area of the dialog shows a cloud icon and a blue "Browse" button, with the text "or drag a file here" below it. At the bottom of the dialog, there is a "+ New notebook" button on the left and a "Cancel" button on the right.

PRO Making the Most of your Colab Subscription

File Edit View Insert Runtime Tools Help

+ Code + Text Copy to Drive

Connect Gemini

Open notebook

- Examples >
- Recent >
- Google Drive >
- GitHub >
- Upload >

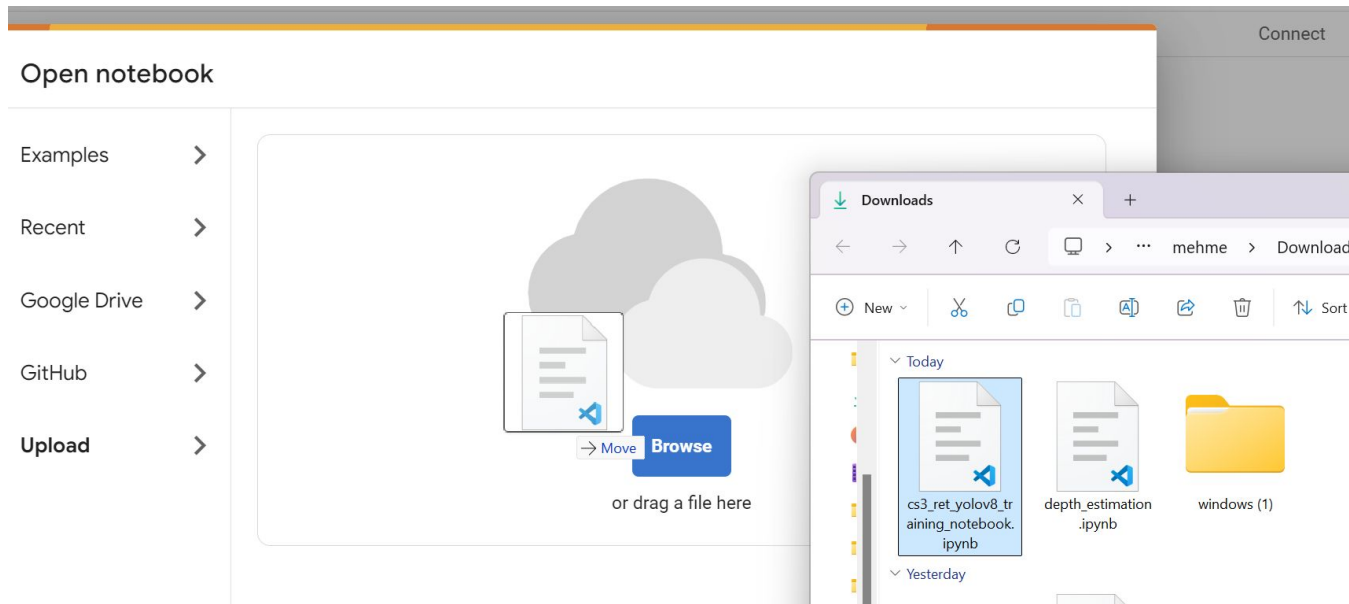
Browse

or drag a file here

+ New notebook Cancel

```
[ ] gpu_info = !nvidia-smi
gpu_info = '\n'.join(gpu_info)
if gpu_info.find('failed') > 0:
    print('Not connected to a GPU')
else:
    print(gpu_info)
```

Drag and drop the training notebook at the following link:
<https://drive.google.com/file/d/1Q2nRfuA020fxSn7IDEHpEVOEurFJAADy/view?usp=sharing>



Press "Connect" on Top Right to get Started

 PRO cs3_ret_yolov8_training_notebook.ipynb ☆
File Edit View Insert Runtime Tools Help [Last saved at 11:08 AM](#)

 Comment

 Share





+ Code + Text

Connect

◆ Gemini



Connect to a new runtime

▼ YOLO Training Guide

Step 1: Install Ultralytics

```
[ ] %pip install ultralytics
import ultralytics
```

 Collecting ultralytics
Downloading ultralytics-8.2.64-py3-none-any.whl (824 kB)
824.8/824.8 kB 9.3 MB/s eta 0:00:00
Requirement already satisfied: numpy<2.0.0,>=1.23.0 in /usr/local/lib/python3.10/dist-packages (from ultralytics) (1.25.2)
Requirement already satisfied: matplotlib>=3.3.0 in /usr/local/lib/python3.10/dist-packages (from ultralytics) (3.7.1)
Requirement already satisfied: opencv-python<4.9.0.80,>=4.8.1.78 in /usr/local/lib/python3.10/dist-packages (from ultralytics) (4.9.0.80)

Click on the Folder icon to the left to show the local files



Using cached nvidia_nccl_cu12-2.20.5-py3-none-manylinu
[] Using cached nvidia_nvtx_cu12-12.1.105-py3-none-manyli
Downloading ultralytics_thop-2.0.0-py3-none-any.whl (2
Downloading nvidia_nvjitlink_cu12-12.5.82-py3-none-man
21.3/21.3
Installing collected packages: nvidia-nvtx-cu12, nvidi
Successfully installed nvidia-cublas-cu12-12.1.3.1 nvi

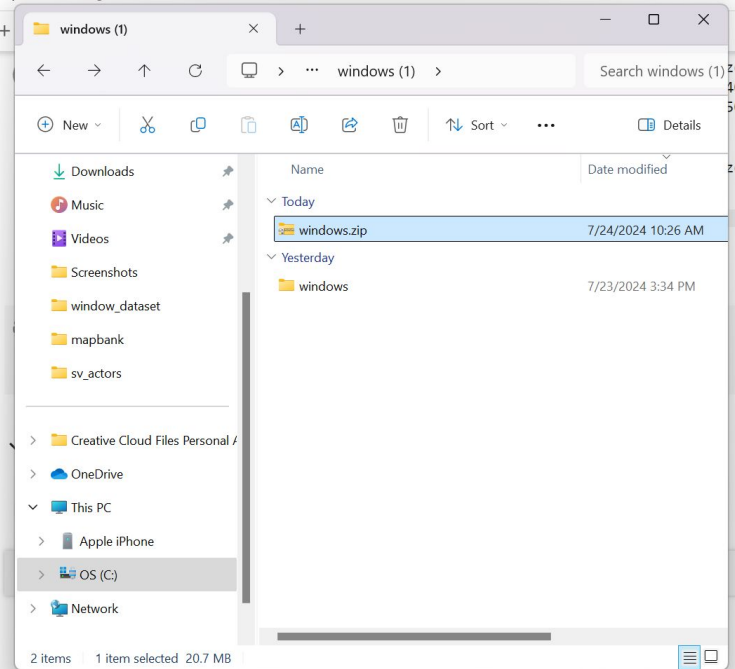
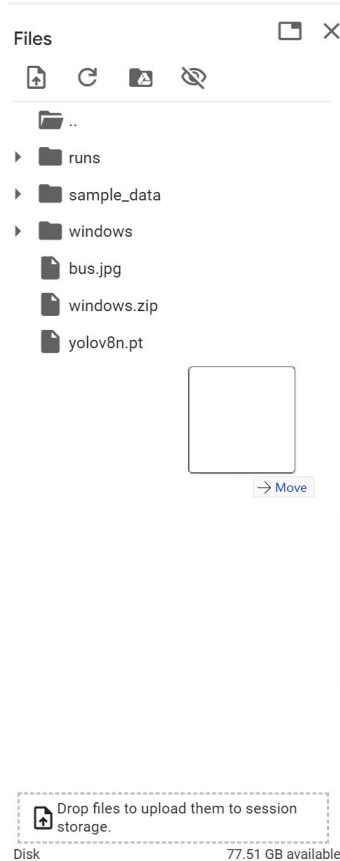
```
from ultralytics import YOLO

# Load a model
model = YOLO('yolov8n.pt') # load a pretrained model
model.train(data='brain-tumor.yaml', epochs=1)
```

Ultralytics YOLOv8.2.64 Python-3.10.12 torch-2.3.1+
engine/trainer: task=detect, mode=train, model=yolov8n
Overriding model.yaml nc=80 with nc=2

	from	n	params	module
0	-1	1	464	ultralytics.nn.m
1	-1	1	4672	ultralytics.nn.m

Move windows.zip file
(<https://drive.google.com/file/d/1tBCSwfhS9NMnNEhIZn6yHwdKYtwrcpFJ/view?usp=sharing>) to
the section to the left -
for colab add it to the
CONTENT folder



Run cells by clicking the circular start button or by pressing Shift+Enter after clicking on their contents

▼ YOLO Training Guide

Step 1: Install Ultralytics



```
%pip install ultralytics  
import ultralytics
```



Collecting ultralytics

Downloading ultralytics-8.2.64-py3-none-any.whl (824 kB)

824.8/824.8 kB 9.3 MB/s eta 0:0

Requirement already satisfied: numpy<2.0.0,>=1.23.0 in /usr/local/lib/python3

Requirement already satisfied: matplotlib>=3.3.0 in /usr/local/lib/python3.10

Requirement already satisfied: opencv-python>=4.6.0 in /usr/local/lib/python3

Requirement already satisfied: pillow>=7.1.2 in /usr/local/lib/python3.10/dis

Requirement already satisfied: pyyaml>=5.3.1 in /usr/local/lib/python3.10/dis

Requirement already satisfied: requests>=2.23.0 in /usr/local/lib/python3.10/

Requirement already satisfied: scipy>=1.4.1 in /usr/local/lib/python3.10/dist

Requirement already satisfied: torch>=1.8.0 in /usr/local/lib/python3.10/dist

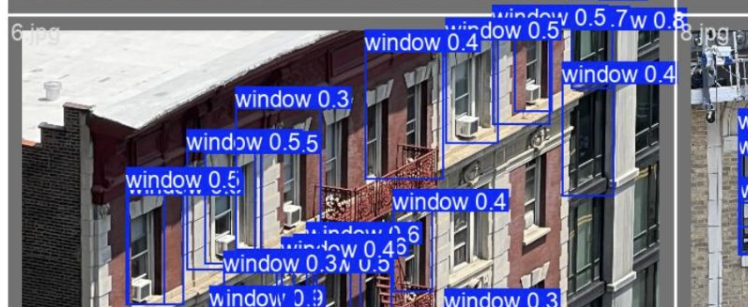
Requirement already satisfied: torchvision>=0.9.0 in /usr/local/lib/python3.10

Now, Run Cells until the Start of Step 5

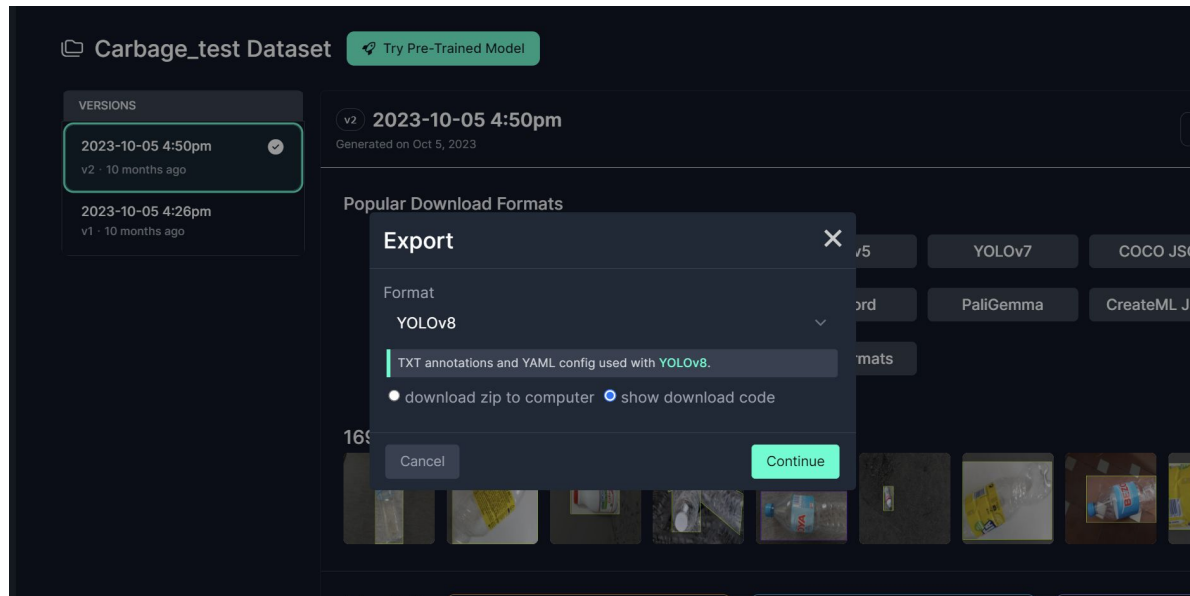

```

..
└─ runs
    └─ detect
        └─ train
            └─ weights
                F1_curve.png
                PR_curve.png
                P_curve.png
                R_curve.png
                args.yaml
                confusion_matrix.png
                confusion_matrix_normalized.png
                events.out.tfevents.1721831747.50ee36f3d489.573.0
                labels.jpg
                labels_correlogram.jpg
                results.csv
                results.png
                train_batch0.jpg
                train_batch1.jpg
                train_batch2.jpg
                train_batch90.jpg
                train_batch91.jpg
                train_batch92.jpg
                val_batch0_labels.jpg
                val_batch0_pred.jpg

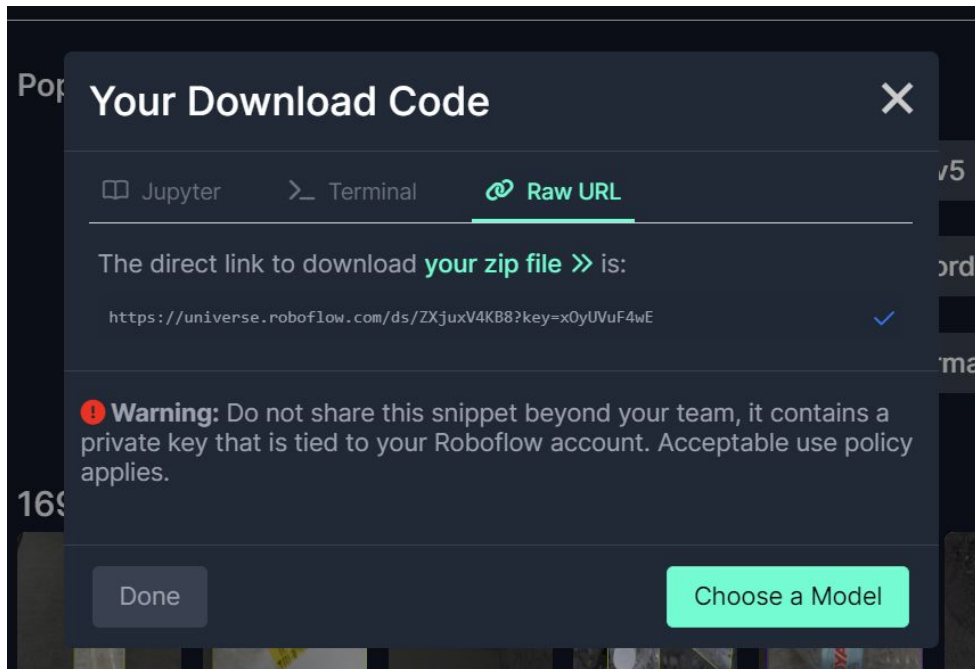
```



Create a New Task



Copy the link



Replace the link in Step 5

- Step 5: Use a Dataset from Roboflow!

IMPORTANT: Replace the link below with what you get from Roboflow

✓
2s



```
!wget "https://universe.roboflow.com/ds/ZXjuxV4KB8?key=x0yUVuF4wE" -O temp.zip
!unzip temp.zip
```



```
extracting: valid/images/Plastico_28_jpg.rf.5ae8a2e9994b251b76be2996df4be91e.jpg
extracting: valid/images/Plastico_295_jpg.rf.e38c20456e08c7113be258f8d6855b0c.jpg
extracting: valid/images/Plastico_299_jpg.rf.83ab73f02359a24a575c1d768adac830.jpg
extracting: valid/images/Plastico_300_jpg.rf.d40c2f52cdd204db7d44fbb20d40ba26.jpg
```

Run the succeeding cells and get your model!

```
from ultralytics import YOLO

# Load a model
model = YOLO('yolov8n.pt') # load a pretrained model (recommended for training)
model.train(data='data.yaml', epochs=10)
```

```
...
  from n  params module
0      -1 1    464 ultralytics.nn.modules.conv.Conv [3, 16, 3, 2]
1      -1 1   4672 ultralytics.nn.modules.conv.Conv [16, 32, 3, 2]
2      -1 1   7360 ultralytics.nn.modules.block.C2f [32, 32, 1, True]
3      -1 1  18560 ultralytics.nn.modules.conv.Conv [32, 64, 3, 2]
4      -1 2  49664 ultralytics.nn.modules.block.C2f [64, 64, 2, True]
5      -1 1  73984 ultralytics.nn.modules.conv.Conv [64, 128, 3, 2]
6      -1 2 197632 ultralytics.nn.modules.block.C2f [128, 128, 2, True]
7      -1 1 295424 ultralytics.nn.modules.conv.Conv [128, 256, 3, 2]
8      -1 1 460288 ultralytics.nn.modules.block.C2f [256, 256, 1, True]
9      -1 1 164608 ultralytics.nn.modules.block.SPPF [256, 256, 5]
10     -1 1      0 torch.nn.modules.upsampling.Upsample [None, 2, 'nearest']
11    [-1, 6] 1      0 ultralytics.nn.modules.conv.Concat [1]
12     -1 1 148224 ultralytics.nn.modules.block.C2f [384, 128, 1]
13     -1 1      0 torch.nn.modules.upsampling.Upsample [None, 2, 'nearest']
14    [-1, 4] 1      0 ultralytics.nn.modules.conv.Concat [1]
15     1 1  37344 ultralytics.nn.modules.block.C2f [128, 64, 1]
```

Remember to download your models for future use!
(Find best.pt, click on the three dots, press “Download”)

