

Requirements

```
sudo apt update
sudo apt install python3-pip
sudo apt install libopencv-dev

#INSTALAR cuda-toolkit-----
#Base Installer
wget
https://developer.download.nvidia.com/compute/cuda/repos/ubuntu2204/x86_64/
/cuda-ubuntu2204.pin
sudo mv cuda-ubuntu2204.pin
/etc/apt/preferences.d/cuda-repository-pin-600
wget
https://developer.download.nvidia.com/compute/cuda/12.5.0/local_installers/
/cuda-repo-ubuntu2204-12-5-local_12.5.0-555.42.02-1_amd64.deb
sudo dpkg -i
cuda-repo-ubuntu2204-12-5-local_12.5.0-555.42.02-1_amd64.deb
sudo cp
/var/cuda-repo-ubuntu2204-12-5-local/cuda-*-keyring.gpg
/usr/share/keyrings/
sudo apt-get update
sudo apt-get -y install cuda-
toolkit-12-5

#Driver Installer
sudo apt-get install -y nvidia-driver-555-open
sudo apt-get install -y cuda-drivers-555

#INSTALAR cuDNN
#Base Installer
wget
https://developer.download.nvidia.com/compute/cudnn/9.2.0/local_installers/
/cudnn-local-repo-ubuntu2204-9.2.0_1.0-1_amd64.deb
sudo dpkg -i cudnn-local-repo-ubuntu2204-9.2.0_1.0-1_amd64.deb
sudo cp /var/cudnn-local-repo-ubuntu2204-9.2.0/cudnn-*-keyring.gpg
/usr/share/keyrings/
sudo apt-get update
sudo apt-get -y install cudnn
```

```
pip3 install tensorflow
```

Usar a Open Images Dataset

Usando o OIv4 Toolkit

Clonar ferramenta OIv4

```
git clone https://github.com/EscVM/OIv4_ToolKit.git
```

```
cd 0IDv4_ToolKit/
```

Instalar dependências

```
pip3 install -r requirements.txt
```

Baixar imagens de treino pela ferramenta

Baixar imagens de treino

```
python3 main.py downloader --classes Box Coffee_cup Computer_mouse --
type_csv train --limit 500 --multiclass 1
```

```
[INFO] | Downloading ['Box', 'Coffee cup', 'Computer mouse'] together.  
[ERROR] | Missing the class-descriptions-boxable.csv file.  
[DOWNLOAD] | Do you want to download the missing file? [Y/n] y  
..145%, 0 MB, 1112 KB/s, 0 seconds passed  
[DOWNLOAD] | File class-descriptions-boxable.csv downloaded into OID/csv_folder/class-descript  
ions-boxable.csv.  
[ERROR] | Missing the train-annotations-bbox.csv file.  
[DOWNLOAD] | Do you want to download the missing file? [Y/n] y  
..100%, 1138 MB, 32748 KB/s, 35 seconds passed  
[DOWNLOAD] | File train-annotations-bbox.csv downloaded into OID/csv_folder/train-annotations-  
bbox.csv.
```

-----Box-----

```
[INFO] | Downloading train images.  
[INFO] | [INFO] Found 2212 online images for train.  
[INFO] | Limiting to 500 images.  
[INFO] | Download of 500 images in train.  
100%|██████████████████████████████████████████████████████████████████████████████| 500/500 [01:59<00:00, 4.19it/s]  
[INFO] | Done!  
[INFO] | Creating labels for Box of train.  
[INFO] | Labels creation completed.
```

-----Coffee cup-----

```
[INFO] | Downloading train images.  
[INFO] | [INFO] Found 3793 online images for train.  
[INFO] | Limiting to 500 images.  
[INFO] | Download of 498 images in train.  
100%|██████████████████████████████████████████████████████████████████████████████| 498/498 [02:13<00:00, 3.74it/s]  
[INFO] | Done!  
[INFO] | Creating labels for Coffee cup of train.  
[INFO] | Labels creation completed.
```

-----Computer mouse-----

```
[INFO] | Downloading train images.  
[INFO] | [INFO] Found 622 online images for train.  
[INFO] | Limiting to 500 images.  
[INFO] | Download of 499 images in train.  
100%|██████████████████████████████████████████████████████████████████████████████| 499/499 [02:26<00:00, 3.41it/s]  
[INFO] | Done!  
[INFO] | Creating labels for Computer mouse of train.  
[INFO] | Labels creation completed.
```

Obs: Se apresentar :

```
[INFO] | Downloading train images.
[INFO] | [INFO] Found 18525 online images for train.
[INFO] | Limiting to 500 images.
[INFO] | Download of 500 images in train.
sh: 1: aws: not found
0%|
0/500 [00:00<?, ?it/s]sh: 1: aws: not found
sh: 1: aws: not found
sh: 1: aws: not found
sh: 1: aws: not found
sh: 1: aws: not found
sh: 1: aws: not found
sh: 1: aws: not found
sh: 1: aws: not found
sh: 1: aws: not found
```

Instale a AWS CLI:

```
sudo apt-get update
sudo apt-get install awscli
```

Verifique a instalação:

```
aws --version
```

Baixar imagens de teste

```
python3 main.py downloader --classes Box Coffee_cup Computer_mouse --
type_csv test --limit 100 --multiclass 1
```



Converter arquivos de anotações

Mudar a classes no arquivo txt

/OIDv4 ToolKit/classes.txt

```
cat classes.txt
echo -e "Box\nCoffee cup\nComputer mouse" > classes.txt
```

Baixar repositório de ferramentas de conversão de anotações

```
git clone -n
https://github.com/Hemilibeatriz/TreinamentoCustomizadoYOLO.git
cd TreinamentoCustomizadoYOLO/
```

```
git checkout HEAD converter_anotacoes.py  
mv converter_anotacoes.py ../
```

Edição dos arquivos de configuração

```
git clone https://github.com/AlexeyAB/darknet  
cd darknet/
```

Configurar Makefile

```
nano Makefile
```

Certifique-se de que as seguintes opções estão definidas como 1:

```
GPU=1  
CUDNN=1  
OPENCV=1
```

Compilar o darknet

```
make clean  
make -j8
```

Modificação do .cfg

```
cp cfg/yolov4.cfg ../yolov4_custom.cfg
```

```

yolov4_custom.cfg
yolov4_custom.cfg
1  [net]
2  batch=64
3  subdivisions=64
4  # Training
5  #width=512
6  #height=512
7  width=608
8  height=608
9  channels=3
10 momentum=0.949
11 decay=0.0005
12 angle=0
13 saturation = 1.5
14 exposure = 1.5
15 hue=.1
16
17 learning_rate=0.0013
18 burn_in=1000
19 #2000 * classes = 2000 8 3 = 6000
20 max_batches = 6000
21 policy=steps
22 #80%/90% do valor do max_batches
23 steps=4800,5400
24 scales=.1,.1
25

```

```

959 [convolutional]
960 size=1
961 stride=1
962 pad=1
963 #(classes + 5) * 3
964 filters=24
965 activation=linear
966
967
968 [yolo]
969 mask = 0,1,2
970 anchors = 12, 16, 19, 36, 40, 28, 36, 75, 76, 55, 72, 146,
971 classes=3
972 num=9
973 jitter=.3
974 ignore_thresh = .7

```

in /darknet

```

touch obj.names
touch obj.data

```

depuis

```
touch obj.names
touch obj.data
cp obj.* ../
```

Gerar arquivos de train.txt e test.txt

```
cd OIDv4_ToolKit/
mkdir data
cp -r OID/Dataset/train/Box_Coffee\ cup_Computer\ mouse/ ./data/obj
cp -r OID/Dataset/test/Box_Coffee\ cup_Computer\ mouse/ ./data/valid
```

Baixar ferramenta de geração de treino e teste

```
cd TreinamentoCustomizadoYOLO/
git checkout HEAD gera_train.py
git checkout HEAD gera_test.py
mv gera_t* ../
```

Executar ferramenta de geração de treino e teste

```
python3 gera_train.py
python3 gera_teste.py

python3 gera_train.py
python3 gera_test.py
```

Treinamento YOLO

in /darknet

```
cp ../yolov4_custom.cfg ./cfg/
cp ../obj.* ./data/
cp ../t* ./data/
cp -r ../OIDv4_ToolKit/data/obj/ ./data/
cp -r ../OIDv4_ToolKit/data/valid/ ./data/
```

Baixar pesos pré treinados das camadas convolucionais

```
wget
https://github.com/AlexeyAB/darknet/releases/download/darknet_yolo_v3_opti
mal/yolov4.conv.137
```

```
$ ls
3rdparty      darknet.py      LICENSE         scripts
backup        darknet_video.py Makefile        src
build         data            net_cam_v3.sh  vcpkg.json
build.ps1     docker-compose.yml net_cam_v4.sh  vcpkg.json.opencv23
cfg           Dockerfile.cpu  obj            video_yolov3.sh
cmake         Dockerfile.gpu  obj.data       video_yolov4.sh
CMakeLists.txt image_yolov3.sh obj.names      yolov4.conv.137
darknet       image_yolov4.sh package.xml
DarknetConfig.cmake.in include         README.md
darknet_images.py json_mjpeg_streams.sh results
```

```
./darknet detector train data/obj.data cfg/yolov4_custom.cfg
yolov4.conv.137 -map
```