

```
1 #@title  
2 from google.colab import drive  
3 drive.mount("/content/drive")
```

Mounted at /content/drive

```
1 !pip install opencv-python==4.5.3.56
```

```
Collecting opencv-python==4.5.3.56  
  Downloading opencv_python-4.5.3.56-cp37-cp37m-manylinux2014_x86_64.whl (49.9 MB)  
    |██████████| 49.9 MB 16 kB/s  
Requirement already satisfied: numpy>=1.14.5 in /usr/local/lib/python3.7/dist-packages (from opencv-python==4.5.3.56) (1.19.5)  
Installing collected packages: opencv-python  
  Attempting uninstall: opencv-python  
    Found existing installation: opencv-python 4.1.2.30  
    Uninstalling opencv-python-4.1.2.30:  
      Successfully uninstalled opencv-python-4.1.2.30  
ERROR: pip's dependency resolver does not currently take into account all the packages that are installed. This behaviour is th  
albumentations 0.1.12 requires imgaug<0.2.7,>=0.2.5, but you have imgaug 0.2.9 which is incompatible.  
Successfully installed opencv-python-4.5.3.56
```

```
1 import cv2  
2 import numpy as np  
3 import matplotlib.pyplot as plt  
4 import os
```

```
1 %cd '/content/drive/My Drive/tcc/'  
2 !ls
```

```
/content/drive/My Drive/tcc  
backup  
chart.png  
chart_yolov4_custom.png  
classes.txt  
creating-files-data-and-name.py
```

```
creating-train-and-test-txt-files.py
custom_weight
darknet
Detectar_olho.ipynb
FotosPauloAlmeida
haarcascade
haarcascade_mcs_upperbody.xml
Mapeamento_rosto_68pontos.ipynb
person2
person2.zip
photo.jpg
shape_predictor_68_face_landmarks.dat
shape_predictor_68_face_landmarks.dat.bz2
shape_predictor_68_face_landmarks.dat.bz2.1
shape_predictor_68_face_landmarks.dat.bz2.2
shape_predictor_68_face_landmarks.dat.bz2.3
shape_predictor_68_face_landmarks.dat.bz2.4
shape_predictor_68_face_landmarks.dat.bz2.5
shape_predictor_68_face_landmarks.dat.bz2.6
TCC_treino_deteccao_rosto.ipynb
TestaImagensYolo.ipynb
yolo.py
yolov4_custom.cfg
```

```
1 labelsPath = os.path.join("/content/drive/MyDrive/tcc/person2/classes.names")
2 LABELS = open(labelsPath).read().strip().split("\n")
3 print(LABELS)
```

```
['person']
```

```
1 net = cv2.dnn.readNetFromDarknet("/content/drive/MyDrive/tcc/darknet/cfg/yolov4_custom.cfg" , "/content/drive/MyDrive/tcc/backup
```

```
1 def predict(image):
2
3     # initialize a list of colors to represent each possible class label
4     np.random.seed(42)
5     COLORS = np.random.randint(0, 255, size=(len(LABELS), 2), dtype="uint8")
6     print(COLORS)
```

```
7     (H, W) = image.shape[:2]
8
9     # determine only the "output" layers name which we need from YOLO
10    ln = net.getLayerNames()
11    ln = [ln[i[0] - 1] for i in net.getUnconnectedOutLayers()]
12
13    # construct a blob from the input image and then perform a forward pass of the YOLO object detector,
14    # giving us our bounding boxes and associated probabilities
15    blob = cv2.dnn.blobFromImage(image, 1 / 255.0, (416, 416), swapRB=True, crop=False)
16    net.setInput(blob)
17    layerOutputs = net.forward(ln)
18
19    boxes = []
20    confidences = []
21    classIDs = []
22    threshold = 0.2
23
24    # loop over each of the layer outputs
25    for output in layerOutputs:
26        # loop over each of the detections
27        for detection in output:
28            # extract the class ID and confidence (i.e., probability) of
29            # the current object detection
30            scores = detection[5:]
31            classID = np.argmax(scores)
32            confidence = scores[classID]
33
34            # filter out weak predictions by ensuring the detected
35            # probability is greater than the minimum probability
36            # confidence type=float, default=0.5
37            if confidence > threshold:
38                # scale the bounding box coordinates back relative to the
39                # size of the image, keeping in mind that YOLO actually
40                # returns the center (x, y)-coordinates of the bounding
41                # box followed by the boxes' width and height
42                box = detection[0:4] * np.array([W, H, W, H])
43                (centerX, centerY, width, height) = box.astype("int")
44
```

```

45     # use the center (x, y)-coordinates to derive the top and
46     # and left corner of the bounding box
47     x = int(centerX - (width / 2))
48     y = int(centerY - (height / 2))
49
50     # update our list of bounding box coordinates, confidences,
51     # and class IDs
52     boxes.append([x, y, int(width), int(height)])
53     confidences.append(float(confidence))
54     classIDs.append(classID)
55
56 # apply non-maxima suppression to suppress weak, overlapping bounding boxes
57 idxs = cv2.dnn.NMSBoxes(boxes, confidences, threshold, 0.1)
58
59 # ensure at least one detection exists
60 if len(idxs) > 0:
61     # loop over the indexes we are keeping
62     for i in idxs.flatten():
63         # extract the bounding box coordinates
64         (x, y) = (boxes[i][0], boxes[i][1])
65         (w, h) = (boxes[i][2], boxes[i][3])
66
67         # draw a bounding box rectangle and label on the image
68         color = (255,0,0)
69         cv2.rectangle(image, (x, y), (x + w, y + h), color, 4)
70         text = "{}".format(LABELS[classIDs[i]], confidences[i])
71         cv2.putText(image, text, (x +10, y - 10), cv2.FONT_HERSHEY_SIMPLEX,
72                     1, color, 2)
73
74 return image

```

```

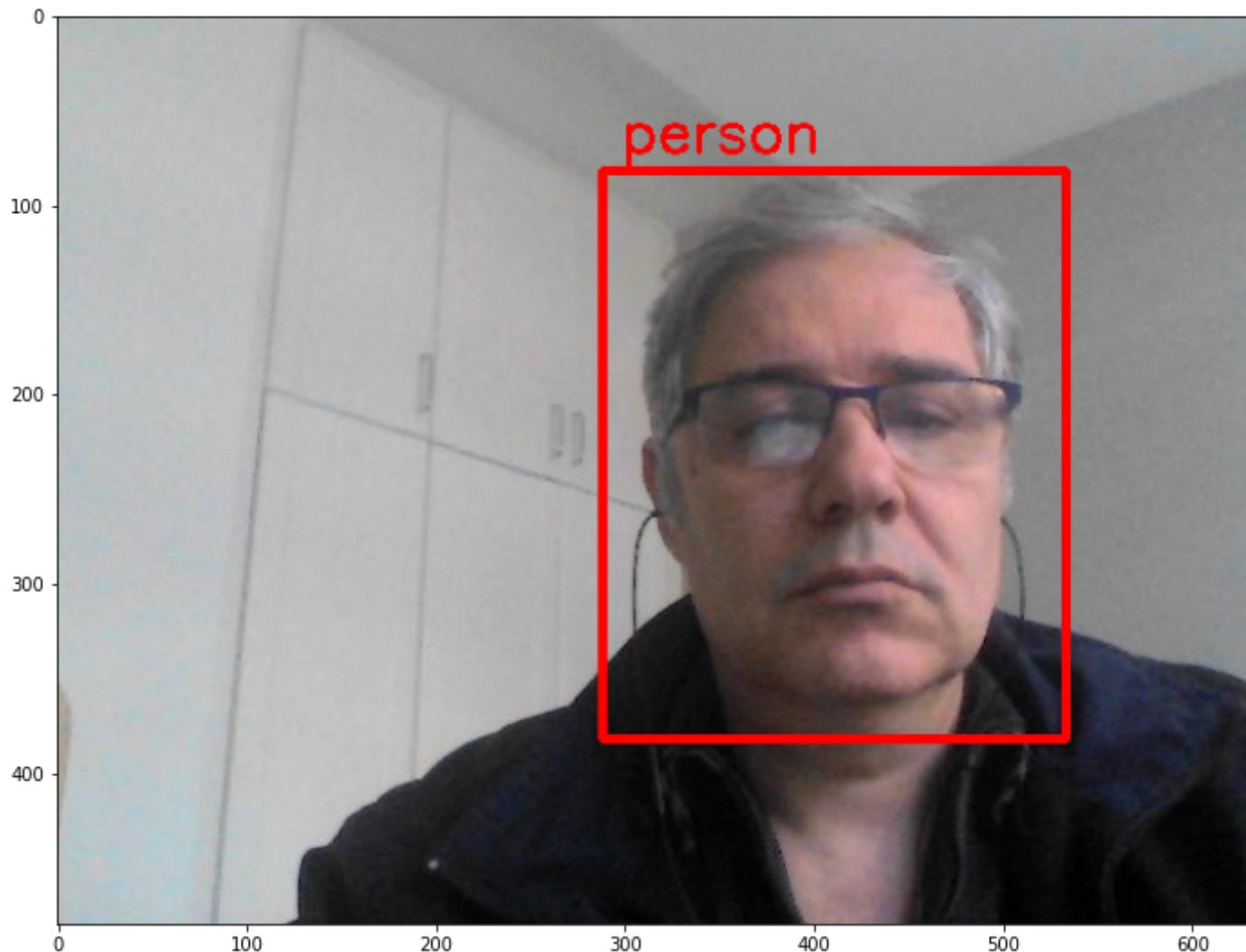
1 def display_img(img,cmap=None):
2     fig = plt.figure(figsize = (12,12))
3     plt.axis(True)
4     ax = fig.add_subplot(111)
5     ax.imshow(img,cmap)

```

```
1 img = cv2.imread("/content/drive/MyDrive/tcc/person2/photo.jpg")
2 img = cv2.cvtColor(img, cv2.COLOR_BGR2RGB)
3 display_img(predict(img))
```

[[102 220]]

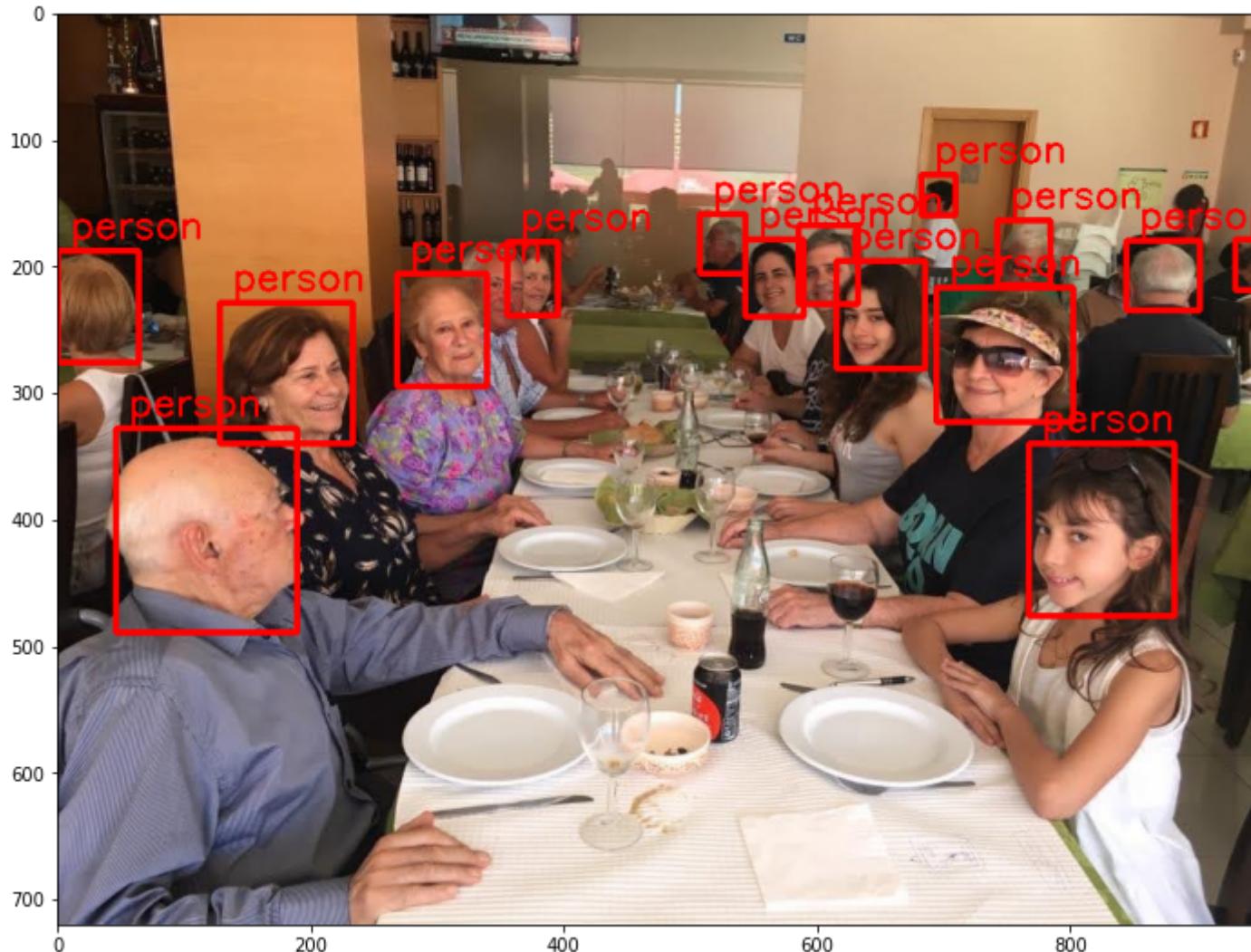
/usr/local/lib/python3.7/dist-packages/ipykernel_launcher.py:4: MatplotlibDeprecationWarning: Adding an axes using the same arg
after removing the cwd from sys.path.



```
1 img = cv2.imread("/content/drive/MyDrive/tcc/person2/5539a3d3-5d85-4c04-93d9-977c9beba21b.jpg")
2 img = cv2.cvtColor(img, cv2.COLOR_BGR2RGB)
3 display_img(predict(img))
```

[[102 220]]

/usr/local/lib/python3.7/dist-packages/ipykernel_launcher.py:4: MatplotlibDeprecationWarning: Adding an axes using the same arg after removing the cwd from sys.path.



```
1 img = cv2.imread("/content/drive/MyDrive/tcc/person2/IMG_7386.jpg")
2 img = cv2.cvtColor(img, cv2.COLOR_BGR2RGB)
3 display_img(predict(img))
```

[[102 220]]

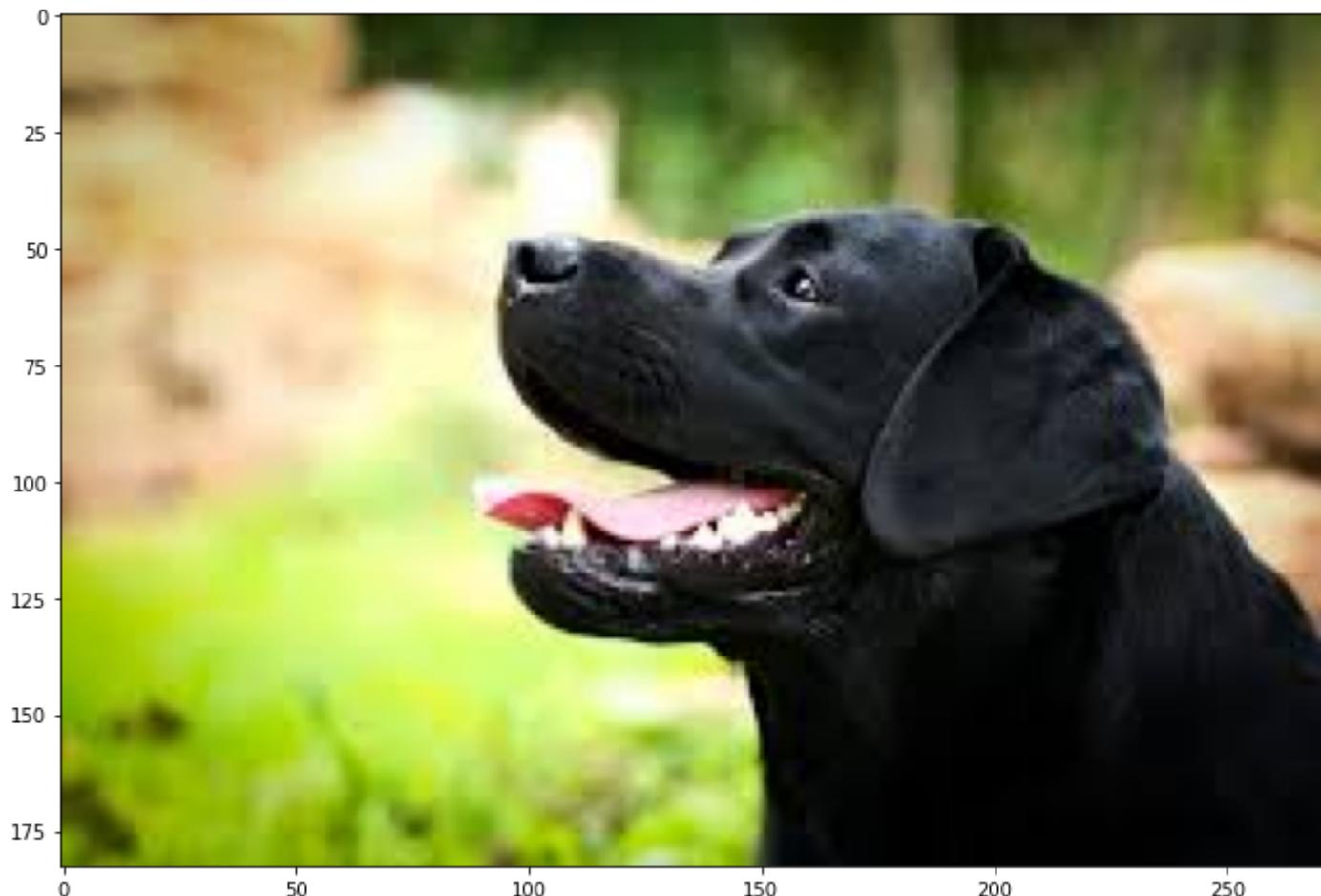
/usr/local/lib/python3.7/dist-packages/ipykernel_launcher.py:4: MatplotlibDeprecationWarning: Adding an axes using the same arg
after removing the cwd from sys.path.



```
1 img = cv2.imread("/content/drive/MyDrive/tcc/person2/cachorroPreto.jpg")
2 img = cv2.cvtColor(img, cv2.COLOR_BGR2RGB)
3 display_img(predict(img))
```

[[102 220]]

/usr/local/lib/python3.7/dist-packages/ipykernel_launcher.py:4: MatplotlibDeprecationWarning: Adding an axes using the same arg
after removing the cwd from sys.path.



```
1 img = cv2.imread("/content/drive/MyDrive/tcc/person2/caes.jpg")
2 img = cv2.cvtColor(img, cv2.COLOR_BGR2RGB)
3 display_img(predict(img))
```

[[102 220]]

```
/usr/local/lib/python3.7/dist-packages/ipykernel_launcher.py:4: MatplotlibDeprecationWarning: Adding an axes using the same arg  
after removing the cwd from sys.path.
```



```
1 img = cv2.imread("/content/drive/MyDrive/tcc/person2/gatos.jpg")  
2 img = cv2.cvtColor(img, cv2.COLOR_BGR2RGB)  
3 display_img(predict(img))
```

[[102 220]]

/usr/local/lib/python3.7/dist-packages/ipykernel_launcher.py:4: MatplotlibDeprecationWarning: Adding an axes using the same arg after removing the cwd from sys.path.



```
1 img = cv2.imread("/content/drive/MyDrive/tcc/person2/bebe.jpg")
2 img = cv2.cvtColor(img, cv2.COLOR_BGR2RGB)
3 display_img(predict(img))
```

[[102 220]]

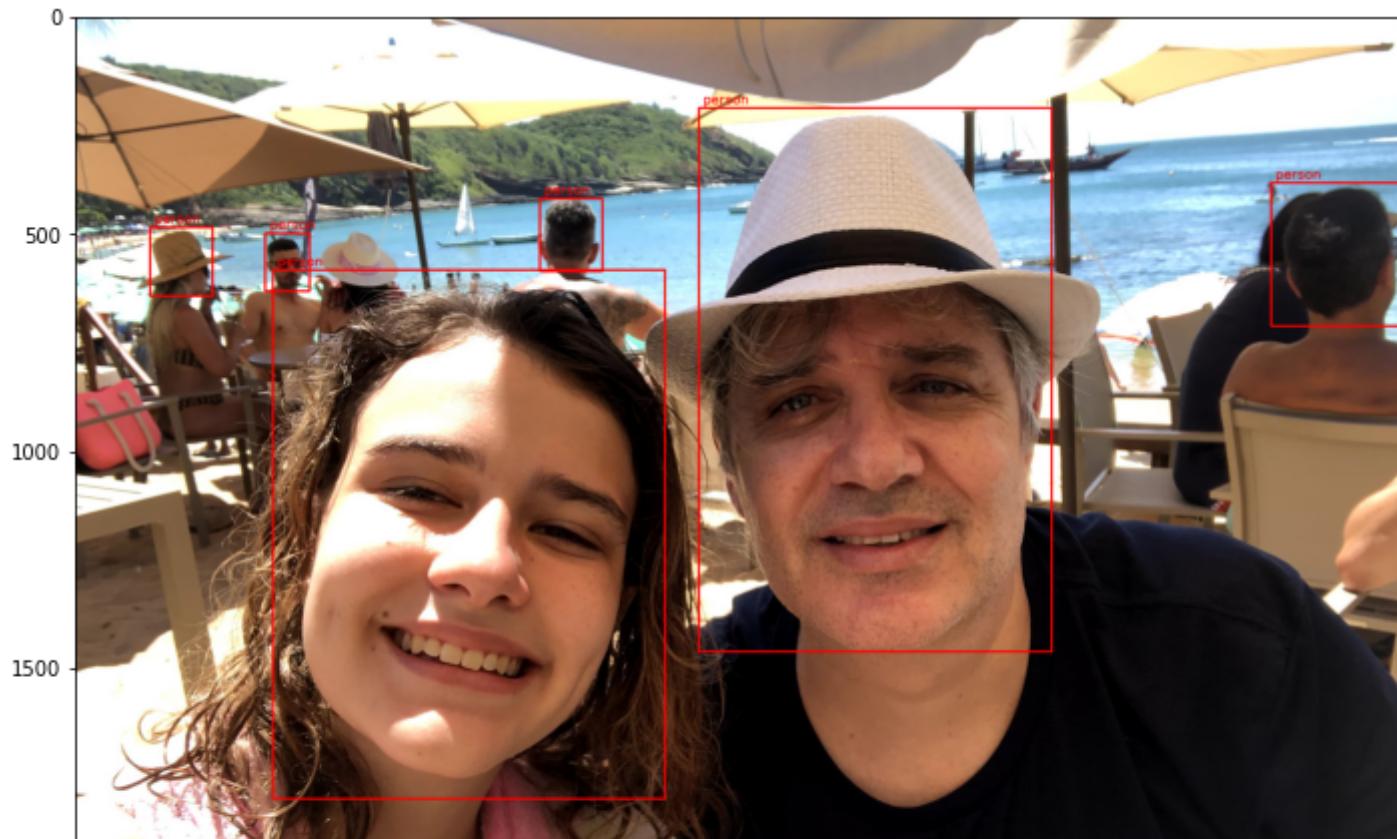
/usr/local/lib/python3.7/dist-packages/ipykernel_launcher.py:4: MatplotlibDeprecationWarning: Adding an axes using the same arg after removing the cwd from sys.path.



```
1 img = cv2.imread("/content/drive/MyDrive/tcc/person2/IMG_1904.jpg")
2 img = cv2.cvtColor(img, cv2.COLOR_BGR2RGB)
3 display_img(predict(img))
```

[[102 220]]

/usr/local/lib/python3.7/dist-packages/ipykernel_launcher.py:4: MatplotlibDeprecationWarning: Adding an axes using the same arg after removing the cwd from sys.path.



1



✓ 7s conclusão: 10:17

