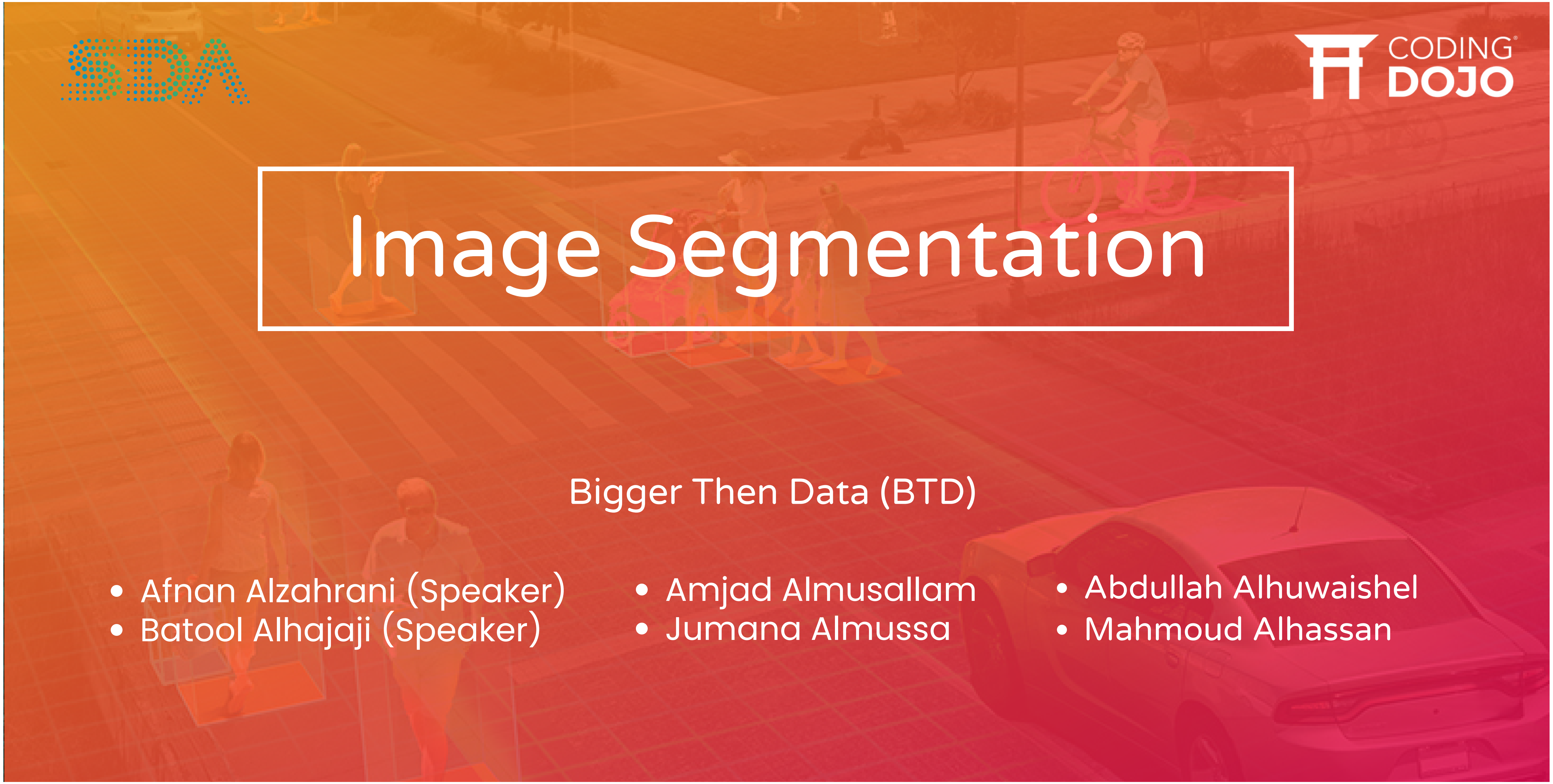

Image Segmentation

Bigger Then Data (BTD)

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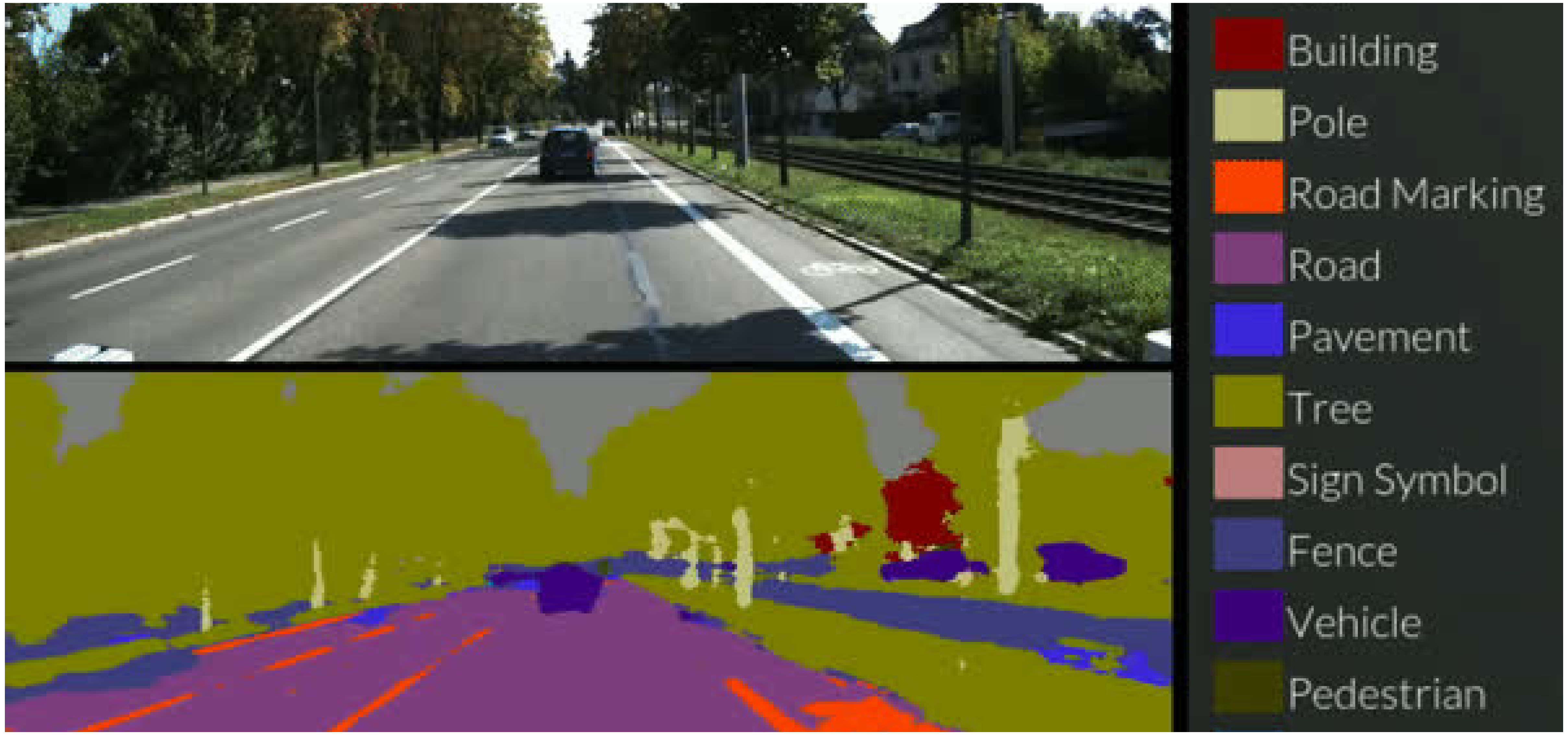
What is image segmentation?

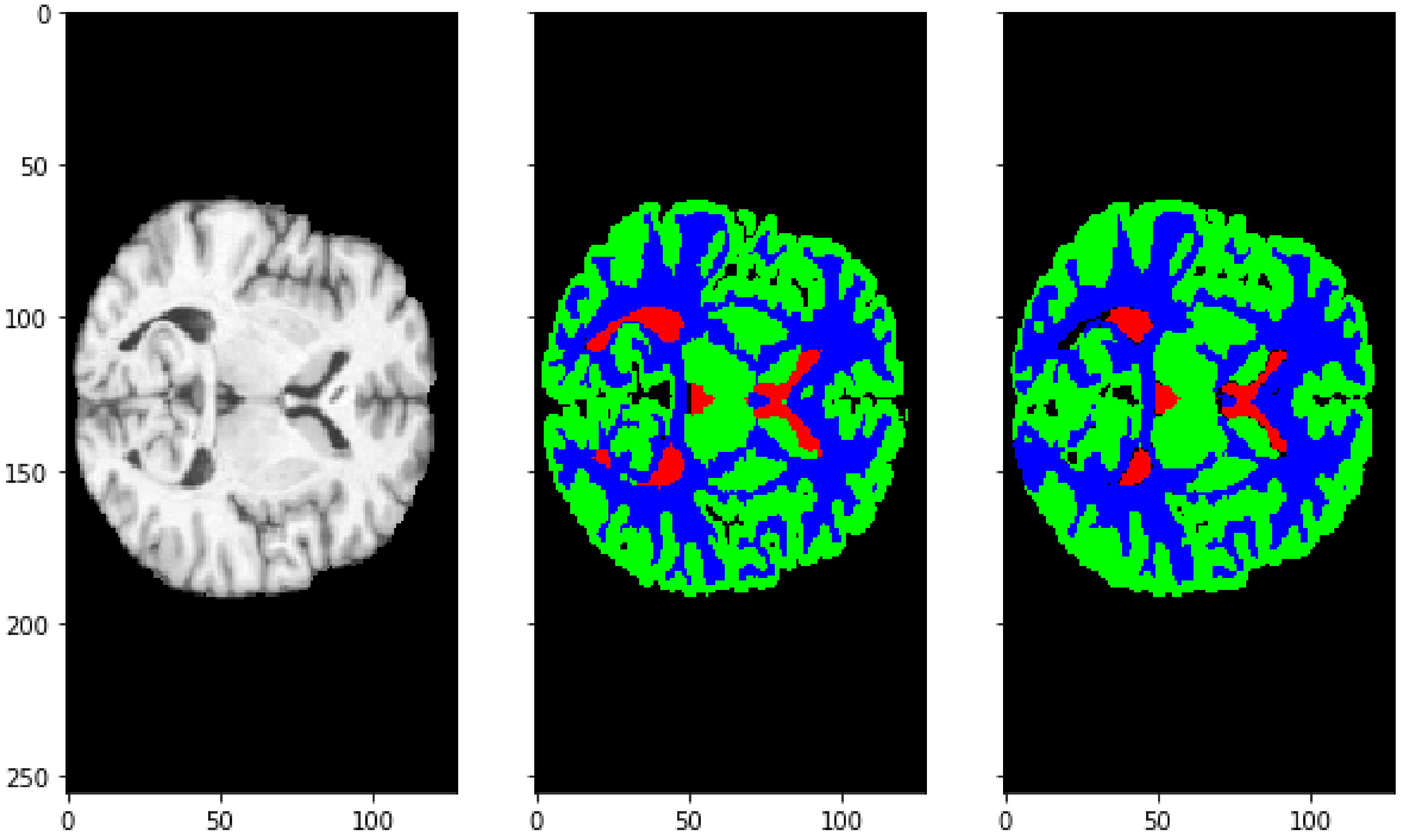


One of the most important operations in Computer Vision
Segmentation is the task of labelling each pixel of the image into a predefined set of classes.

Applications

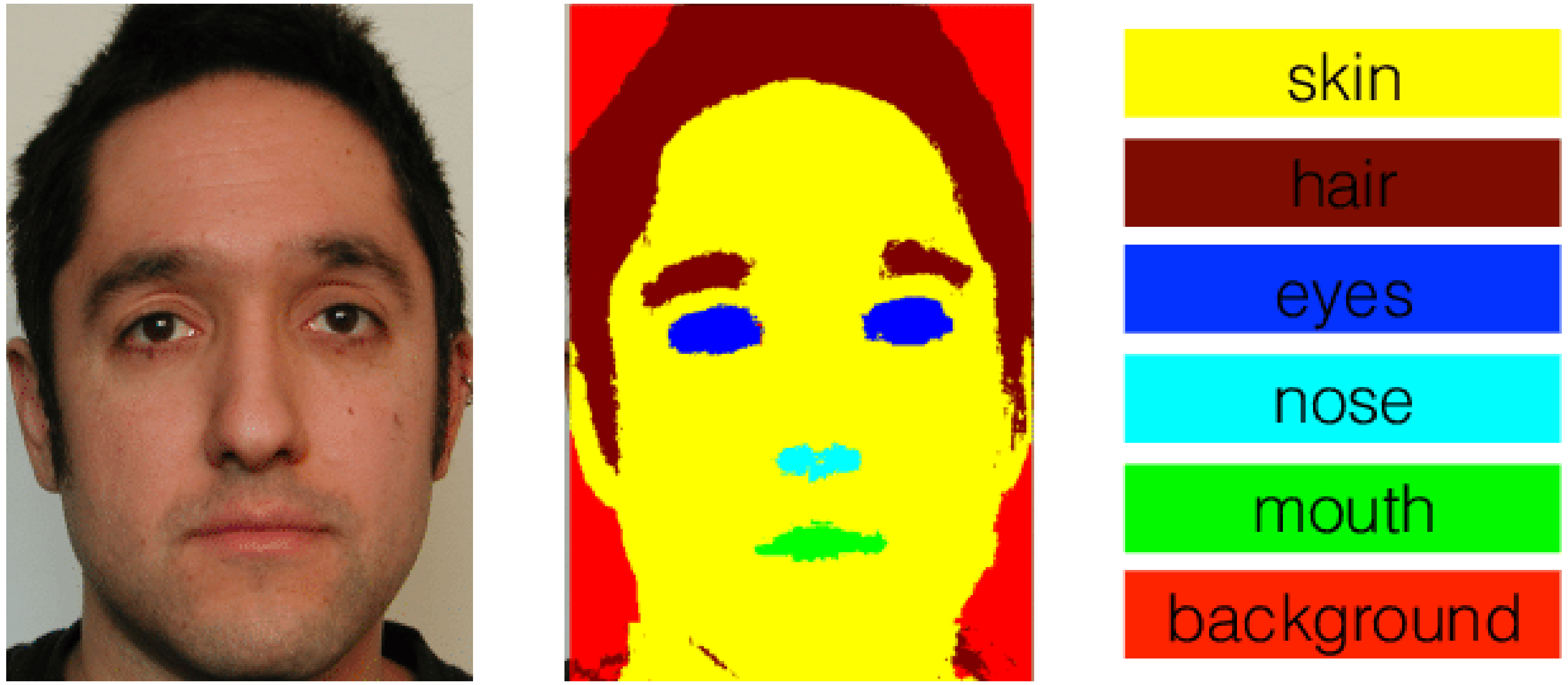
- Bio-medical image analysis

For example, models can be used to segment CT scans to detect tumours

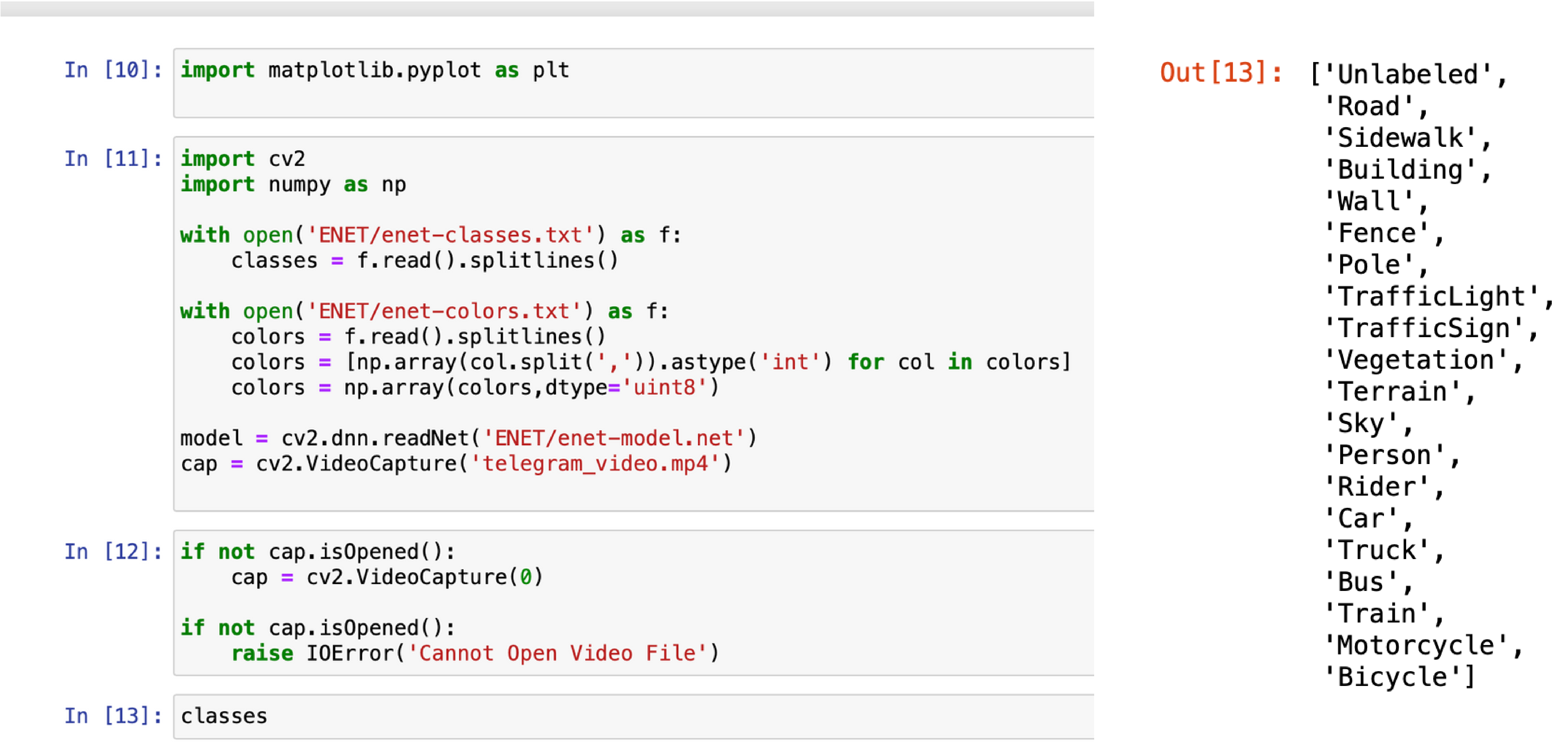


Applications

- Facial segmentation



Computer vision using OpenCV



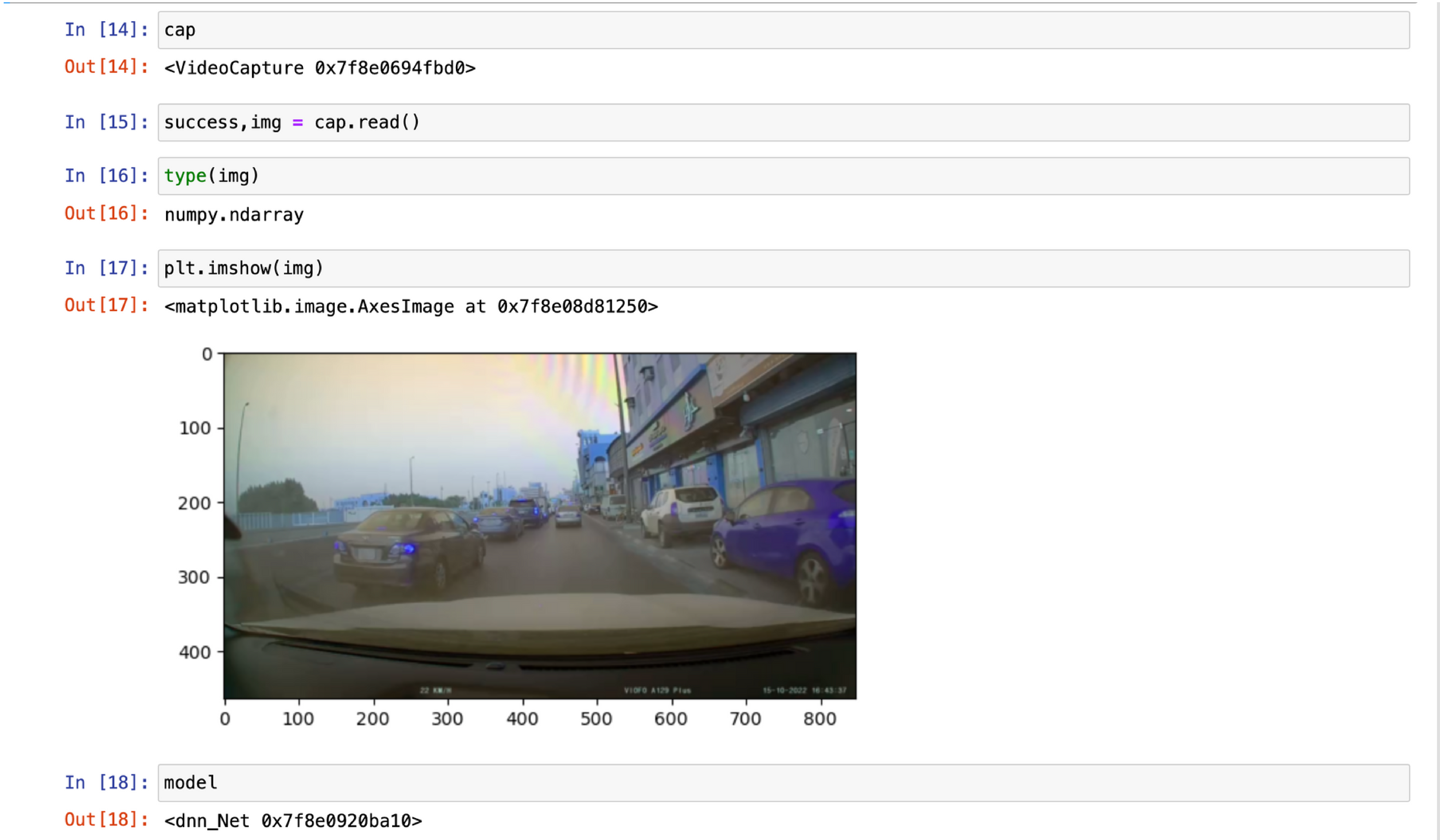
```
In [10]: import matplotlib.pyplot as plt
```

```
In [11]: import cv2
         import numpy as np

         with open('ENET/enet-classes.txt') as f:
             classes = f.read().splitlines()

         with open('ENET/enet-colors.txt') as f:
             colors = f.read().splitlines()
             colors = [np.array(col.split(',')).astype('int') for col in colors]
             colors = np.array(colors,dtype='uint8')

         model = cv2.dnn.readNet('ENET/enet-model.net')
         cap = cv2.VideoCapture('telegram_video.mp4')
```

```
In [12]: if not cap.isOpened():
             cap = cv2.VideoCapture(0)

         if not cap.isOpened():
             raise IOError('Cannot Open Video File')
```

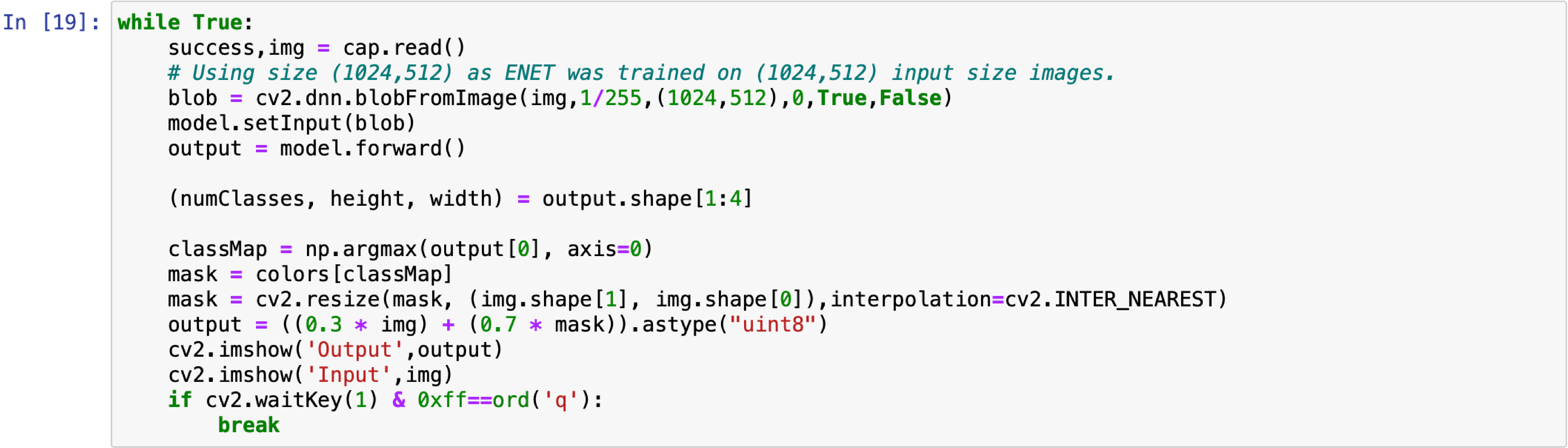
```
In [13]: classes
```

```
Out[13]: ['Unlabeled',
          'Road',
          'Sidewalk',
          'Building',
          'Wall',
          'Fence',
          'Pole',
          'TrafficLight',
          'TrafficSign',
          'Vegetation',
          'Terrain',
          'Sky',
          'Person',
          'Rider',
          'Car',
          'Truck',
          'Bus',
          'Train',
          'Motorcycle',
          'Bicycle']
```



```
In [14]: cap
Out[14]: <VideoCapture 0x7f8e0694fbd0>

In [15]: success,img = cap.read()

In [16]: type(img)
Out[16]: numpy.ndarray

In [17]: plt.imshow(img)
Out[17]: <matplotlib.image.AxesImage at 0x7f8e08d81250>
```

```
In [18]: model
Out[18]: <dnn_Net 0x7f8e0920ba10>
```



```
In [19]: while True:
             success,img = cap.read()
             # Using size (1024,512) as ENET was trained on (1024,512) input size images.
             blob = cv2.dnn.blobFromImage(img,1/255,(1024,512),0,True,False)
             model.setInput(blob)
             output = model.forward()

             (numClasses, height, width) = output.shape[1:4]

             classMap = np.argmax(output[0], axis=0)
             mask = colors[classMap]
             mask = cv2.resize(mask, (img.shape[1], img.shape[0]),interpolation=cv2.INTER_NEAREST)
             output = ((0.3 * img) + (0.7 * mask)).astype("uint8")
             cv2.imshow('Output',output)
             cv2.imshow('Input',img)
             if cv2.waitKey(1) & 0xff==ord('q'):
                 break
```

Thank You !

Source:

https://medium.com/analytics-vidhya/introduction-to-semantic-image-segmentation-856cda5e5de8