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AIES ASSIGNMENT 8

Implementation of Neural Network

[1]:
```
import cv2
import matplotlib.pyplot as plt
%matplotlib inline
```

[6]:
```
# image and cascade names
imagePath = "ar2.jpg"
cascPath = "haarcascade_frontalface_default.xml"

# Create the haar cascade
faceCascade = cv2.CascadeClassifier(cascPath)

# Read the image
image = cv2.imread(imagePath)
```

```
if image is None:
    print("Error: Could not load image.")
else:
    # Convert to grayscale
    gray = cv2.cvtColor(image, cv2.COLOR_BGR2GRAY)

    # Display the original image
    RGB_img = cv2.cvtColor(image, cv2.COLOR_BGR2RGB)
    plt.imshow(RGB_img)
    plt.axis('off')  # Hide axis
    plt.show()

    # Detect faces in the image
    faces = faceCascade.detectMultiScale(
        gray,
        scaleFactor=1.1,
        minNeighbors=5,
        minSize=(30, 30),
        flags=cv2.CASCADE_SCALE_IMAGE
    )

    print("Found {0} faces!".format(len(faces)))

    # Draw a rectangle around the faces
    for (x, y, w, h) in faces:
        cv2.rectangle(image, (x, y), (x + w, y + h), (0, 255, 0), 2)

    # image with detected faces
    RGB_img = cv2.cvtColor(image, cv2.COLOR_BGR2RGB)
    plt.imshow(RGB_img)
    plt.axis('off')
    plt.show()
```


```
Found 6 faces!
```

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Title

Implement a neural network for a real-life application.

FAQs

1. Explain cascade and classifier in detail.

A cascade, in the context of face detection, refers to the 'Haar Cascade', which is a series of simple classifiers applied sequentially. Each classifier in the cascade decides whether a region of the image could contain a face or not. The idea is to quickly discard non-face regions while spending more computational time on regions that might contain a face. The system applies these classifiers one after another, where each stage either discards or accepts the image region. The image regions that pass through all stages are classified as faces.

A classifier is an algorithm that decides whether a given object belongs to a particular category (e.g. face or non-face). The Haar cascade classifier uses a pre-trained set of classifiers, based on positive and negative image samples, to detect objects in an image.

2. What are other cascades provided by OpenCV?

- Haar cascade for face detection
- Eye detection cascade
- Smile detection cascade
- Full-body detection cascade
- Pedestrian detection
- Car plate detection cascade

✓ 18-10-24