In [2]:

```
from tensorflow.keras.preprocessing.image import img_to_array
from tensorflow.keras.models import load_model
import numpy as np
import cv2
import os
import cvlib as cv
```

In [3]:

```
# load model
model = load_model('gender_detection.model')
```

In [4]:

```
# open webcam
webcam = cv2.VideoCapture(0)
classes = ['man','woman']
```

In [ ]:

```
# loop through frames
while webcam.isOpened():
 # read frame from webcam
    status, frame = webcam.read()

    # apply face detection
    face, confidence = cv.detect_face(frame)
    # loop through detected faces
    for idx, f in enumerate(face):

        # get corner points of face rectangle
        (startX, startY) = f[0], f[1]
        (endX, endY) = f[2], f[3]
        # draw rectangle over face
        cv2.rectangle(frame, (startX,startY), (endX,endY), (0,255,0), 2)
        # crop the detected face region
        face_crop = np.copy(frame[startY:endY,startX:endX])

        if (face_crop.shape[0]) < 10 or (face_crop.shape[1]) < 10:
            continue
            # preprocessing for gender detection model
        face_crop = cv2.resize(face_crop, (96,96))
        face_crop = face_crop.astype("float") / 255.0
        face_crop = img_to_array(face_crop)
        face_crop = np.expand_dims(face_crop, axis=0)
```

In [ ]:

```
# apply gender detection on face
        conf = model.predict(face_crop)[0] # model.predict return a 2D matrix, ex: [[9.9993384e-01 7.4850512e-05]]
```

In [ ]:

```
# get label with max accuracy
        idx = np.argmax(conf)
        label = classes[idx]
```

In [ ]:

```
abel = "{}: {:.2f}%".format(label, conf[idx] * 100)

        Y = startY - 10 if startY - 10 > 10 else startY + 10
```

In [ ]:

```
 # write label and confidence above face rectangle
        cv2.putText(frame, label, (startX, Y),  cv2.FONT_HERSHEY_SIMPLEX,
                    0.7, (0, 255, 0), 2)
```

In [ ]:

```
# display output
    cv2.imshow("gender detection", frame)
```

In [ ]:

```
# press "Q" to stop
    if cv2.waitKey(1) & 0xFF == ord('q'):
        break
```

In [ ]:

```
# release resources
webcam.release()
cv2.destroyAllWindows()
```

In [ ]:

```
```