```
#imports
import cv2
import numpy as np
import dlib
import requests
from PIL import Image


#shape_predictor
!wget 'https://github.com/tzutalin/dlib-android/raw/master/data/shape_predictor_68_face_landmarks.dat'
```

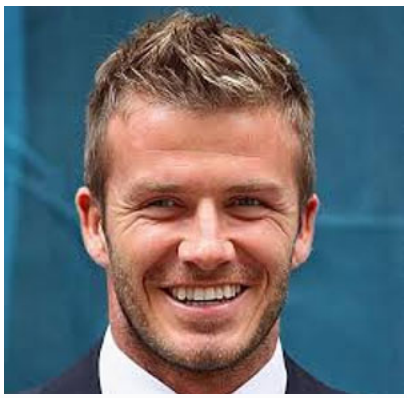
```
--2025-06-01 13:34:21--  https://github.com/tzutalin/dlib-android/raw/master/data/shape_predictor_68_face_landmarks.dat
Resolving github.com (github.com)... 20.205.243.166
Connecting to github.com (github.com)|20.205.243.166|:443... connected.
HTTP request sent, awaiting response... 302 Found
Location: https://raw.githubusercontent.com/tzutalin/dlib-android/master/data/shape_predictor_68_face_landmarks.dat [following]
--2025-06-01 13:34:21--  https://raw.githubusercontent.com/tzutalin/dlib-android/master/data/shape_predictor_68_face_landmarks.dat
Resolving raw.githubusercontent.com (raw.githubusercontent.com)... 185.199.108.133, 185.199.109.133, 185.199.110.133, ...
Connecting to raw.githubusercontent.com (raw.githubusercontent.com)|185.199.108.133|:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: 99693937 (95M) [application/octet-stream]
Saving to: ‘shape_predictor_68_face_landmarks.dat’

shape_predictor_68_ 100%[===================>]  95.08M   335MB/s    in 0.3s

2025-06-01 13:34:28 (335 MB/s) - ‘shape_predictor_68_face_landmarks.dat’ saved [99693937/99693937]
```

```
#Extracting index
def extract_index_nparray(nparray):
    index = None
    for num in nparray[0]:
        index = num
        break
    return index
```

```
image1 = Image.open(requests.get('https://encrypted-tbn0.gstatic.com/images?q=tbn:ANd9GcSx8Pu1tW1uCiZPfj9K1EL6uHxbg3bOKO9XkA&usqp=CAU', strea
image1 = image1.resize((300,300))
image1
```



Next we will load our source image from the internet using url and resize it.

```
image2 = Image.open(requests.get('https://encrypted-tbn0.gstatic.com/images?q=tbn:ANd9GcTYX1dyl9INRo5cbvDeTILRcZVzfcMsCsE0kg&usqp=CAU', strea
image2 = image2.resize((300,300))
image2
```

```
#image to array and gray scale
img = np.array(image1)
img_gray = cv2.cvtColor(img, cv2.COLOR_BGR2GRAY)
mask = np.zeros_like(img_gray)
img2 = np.array(image2)
img2_gray = cv2.cvtColor(img2, cv2.COLOR_BGR2GRAY)


detector = dlib.get_frontal_face_detector()
predictor = dlib.shape_predictor("shape_predictor_68_face_landmarks.dat")
height, width, channels = img2.shape
img2_new_face = np.zeros((height, width, channels), np.uint8)


#Face 1
faces = detector(img_gray)
for face in faces:
    landmarks = predictor(img_gray, face)
    landmarks_points = []
    for n in range(0, 68):
        x = landmarks.part(n).x
        y = landmarks.part(n).y
        landmarks_points.append((x, y))

    points = np.array(landmarks_points, np.int32)
    convexhull = cv2.convexHull(points)
    cv2.fillConvexPoly(mask, convexhull, 255)

    face_image_1 = cv2.bitwise_and(img, img, mask=mask)

    rect = cv2.boundingRect(convexhull)
    subdiv = cv2.Subdiv2D(rect)
    subdiv.insert(landmarks_points)
    triangles = subdiv.getTriangleList()
    triangles = np.array(triangles, dtype=np.int32)

    indexes_triangles = []
    for t in triangles:
        pt1 = (t[0], t[1])
        pt2 = (t[2], t[3])
        pt3 = (t[4], t[5])


        index_pt1 = np.where((points == pt1).all(axis=1))
        index_pt1 = extract_index_nparray(index_pt1)

        index_pt2 = np.where((points == pt2).all(axis=1))
        index_pt2 = extract_index_nparray(index_pt2)

        index_pt3 = np.where((points == pt3).all(axis=1))
        index_pt3 = extract_index_nparray(index_pt3)

        if index_pt1 is not None and index_pt2 is not None and index_pt3 is not None:
            triangle = [index_pt1, index_pt2, index_pt3]
            indexes_triangles.append(triangle)



#Face 2
faces2 = detector(img2_gray)
```

```
    for face in faces2:
        landmarks = predictor(img2_gray, face)
        landmarks_points2 = []
        for n in range(0, 68):
            x = landmarks.part(n).x
            y = landmarks.part(n).y
            landmarks_points2.append((x, y))


        points2 = np.array(landmarks_points2, np.int32)
        convexhull2 = cv2.convexHull(points2)



    lines_space_mask = np.zeros_like(img_gray)
    lines_space_new_face = np.zeros_like(img2)


    #Triangulation
    for triangle_index in indexes_triangles:
        tr1_pt1 = landmarks_points[triangle_index[0]]
        tr1_pt2 = landmarks_points[triangle_index[1]]
        tr1_pt3 = landmarks_points[triangle_index[2]]
        triangle1 = np.array([tr1_pt1, tr1_pt2, tr1_pt3], np.int32)


        rect1 = cv2.boundingRect(triangle1)
        (x, y, w, h) = rect1
        cropped_triangle = img[y: y + h, x: x + w]
        cropped_tr1_mask = np.zeros((h, w), np.uint8)


        points = np.array([[tr1_pt1[0] - x, tr1_pt1[1] - y],
                           [tr1_pt2[0] - x, tr1_pt2[1] - y],
                           [tr1_pt3[0] - x, tr1_pt3[1] - y]], np.int32)

        cv2.fillConvexPoly(cropped_tr1_mask, points, 255)

        cv2.line(lines_space_mask, tr1_pt1, tr1_pt2, 255)
        cv2.line(lines_space_mask, tr1_pt2, tr1_pt3, 255)
        cv2.line(lines_space_mask, tr1_pt1, tr1_pt3, 255)
        lines_space = cv2.bitwise_and(img, img, mask=lines_space_mask)

        tr2_pt1 = landmarks_points2[triangle_index[0]]
        tr2_pt2 = landmarks_points2[triangle_index[1]]
        tr2_pt3 = landmarks_points2[triangle_index[2]]
        triangle2 = np.array([tr2_pt1, tr2_pt2, tr2_pt3], np.int32)


        rect2 = cv2.boundingRect(triangle2)
        (x, y, w, h) = rect2

        cropped_tr2_mask = np.zeros((h, w), np.uint8)

        points2 = np.array([[tr2_pt1[0] - x, tr2_pt1[1] - y],
                            [tr2_pt2[0] - x, tr2_pt2[1] - y],
                            [tr2_pt3[0] - x, tr2_pt3[1] - y]], np.int32)

        cv2.fillConvexPoly(cropped_tr2_mask, points2, 255)

        points = np.float32(points)
        points2 = np.float32(points2)
        M = cv2.getAffineTransform(points, points2)
        warped_triangle = cv2.warpAffine(cropped_triangle, M, (w, h))
        warped_triangle = cv2.bitwise_and(warped_triangle, warped_triangle, mask=cropped_tr2_mask)

        img2_new_face_rect_area = img2_new_face[y: y + h, x: x + w]
        img2_new_face_rect_area_gray = cv2.cvtColor(img2_new_face_rect_area, cv2.COLOR_BGR2GRAY)
        _, mask_triangles_designed = cv2.threshold(img2_new_face_rect_area_gray, 1, 255, cv2.THRESH_BINARY_INV)
        warped_triangle = cv2.bitwise_and(warped_triangle, warped_triangle, mask=mask_triangles_designed)

        img2_new_face_rect_area = cv2.add(img2_new_face_rect_area, warped_triangle)
        img2_new_face[y: y + h, x: x + w] = img2_new_face_rect_area



    #Face swapped
    img2_face_mask = np.zeros_like(img2_gray)
```

```
img2_head_mask = cv2.fillConvexPoly(img2_face_mask, convexhull2, 255)
img2_face_mask = cv2.bitwise_not(img2_head_mask)



img2_head_noface = cv2.bitwise_and(img2, img2, mask=img2_face_mask)
result = cv2.add(img2_head_noface, img2_new_face)


(x, y, w, h) = cv2.boundingRect(convexhull2)
center_face2 = (int((x + x + w) / 2), int((y + y + h) / 2))
seamlessclone = cv2.seamlessClone(result, img2, img2_head_mask, center_face2, cv2.NORMAL_CLONE)


#face swaped
Image.fromarray(seamlessclone)
```