

FEMB
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People counter 7 – Defining a person

Now comes the interesting part, how do we classify a contour as a person?

A simple, but effective, step could be defining a minimum area the contour must have:

```
areaTH = #some number
_, contours0, hierarchy = cv2.findContours(mask2,cv2.RETR_EXTERNAL,cv2.CHAIN_APPROX_SIMPLE)
for cnt in contours0:
    area = cv2.contourArea(cnt)
    if area > areaTH:
        #####
        # TRACKING #
        #####
```

Define a minimum area, find contours, for each contour get the area and if it's more than the threshold do something.

A threshold value is not universal, meaning that is depends on your video stream, you need to test different values until it works with your video.

For example, setting a low threshold will get you things like this:



While setting on too high will get you:



No more than that.

Here's the code:

```
import numpy as np
import cv2

cap = cv2.VideoCapture('peopleCounter.avi') #Open video file
fgbg = cv2.createBackgroundSubtractorMOG2(detectShadows = True) #Create the background subtractor
kernelOp = np.ones((3,3),np.uint8)
kernelCl = np.ones((11,11),np.uint8)
areaTH = 500

while(cap.isOpened()):
    ret, frame = cap.read() #read a frame

    fgmask = fgbg.apply(frame) #Use the subtractor
    try:
        ret,imbIn= cv2.threshold(fgmask,200,255,cv2.THRESH_BINARY)
        #Opening (erode->dilate) para quitar ruido.
        mask = cv2.morphologyEx(imbIn, cv2.MORPH_OPEN, kernelOp)
        #Closing (dilate -> erode) para juntar regiones blancas.
        mask = cv2.morphologyEx(mask , cv2.MORPH_CLOSE, kernelCl)
    except:
        #if there are no more frames to show...
        print('EOF')
        break

    _, contours0, hierarchy = cv2.findContours(mask,cv2.RETR_EXTERNAL,cv2.CHAIN_APPROX_NONE)
    for cnt in contours0:
        cv2.drawContours(frame, cnt, -1, (0,255,0), 3, 8)
        area = cv2.contourArea(cnt)
        print area
        if area > areaTH:
            #####
            # TRACKING #
            #####
            M = cv2.moments(cnt)
            cx = int(M['m00']/M['m00'])
            cy = int(M['m01']/M['m00'])
            x,y,w,h = cv2.boundingRect(cnt)
            cv2.circle(frame,(cx,cy), 5, (0,0,255), -1)
            img = cv2.rectangle(frame,(x,y),(x+w,y+h),(0,255,0),2)

    cv2.imshow('Frame',frame)

    #Abort and exit with 'Q' or ESC
    k = cv2.waitKey(30) & 0xff
    if k == 27:
        break

cap.release() #release video file
cv2.destroyAllWindows() #close all openCV windows
```