Computer Vision
Degree in Information Technology
2º Semester 2020/2021

Worksheet 6

Goals:

- Object recognition and face detection

Exercises

Part I – Shape recognition in images and videos

1- Using the file shape.jpg and adopting computer vision techniques, identify the multiples shapes in the image. Figure 1 illustrates a possible output.

a. Import functions.py. This python file aggregates computer vision techniques.
b. Convert image to gray
c. Apply the blurring method from functions.py.
d. Apply Canny method from functions.py.
e. Apply get_contours method from functions.py.
f. Apply draw_contour method from functions.py.
g. Do the show image including the number of shapes founded.

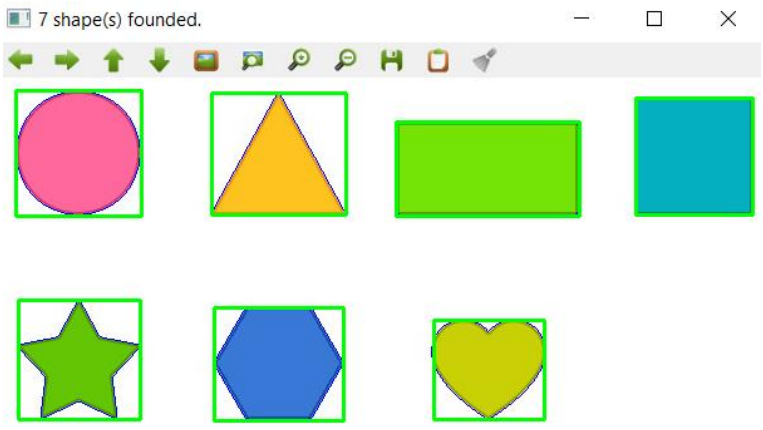

Figure 1 - Shape recognition

2- Experiment the previous code using the video file objects.mp4.

```
video = cv.VideoCapture("objects.mp4")
while True:
    success, frame = video.read()

    if success:
        height, width = frame.shape[:2]
        frame = cv.resize(frame, (width - (width * 65 // 100), height
- (height * 65 // 100)))
        frame_copy = frame.copy()
…..
(continue)
```

a. Use now the camera from your laptop. For that, add 0 as the parameter of VideoCapture - `cv.VideoCapture(0)`

Practical Work stage II

Make your own video to detect object shapes.

Part II – Face Detector

1- Include the haar cascades files to your project. Using smiles.jpg execute the following code:

```
import cv2

#Read the image and converts to gray
i = cv2.imread('smiles.jpg')
iPB = cv2.cvtColor(i, cv2.COLOR_BGR2GRAY)


#Face detector creation
df  =
cv2.CascadeClassifier('haarcascades/haarcascade_frontalface_alt2
.xml')

#Face detector Execution
faces = df.detectMultiScale(iPB, scaleFactor = 1.009,
minNeighbors = 11, minSize = (10,10))

#Draw squares
for (x, y, w, h) in faces:
    cv2.rectangle(i, (x, y), (x + w, y + h), (0, 255, 255), 3)

# Image show with amount of faces founded
cv2.imshow(str(len(faces)) + ' face(s) founded.', i)
cv2.waitKey(0)
```

a. Play with scaleFactor and minNeighbours.
b. Using a figure with just one person (smile.jpg), adapt the previous code to detect smiles
c. Using your laptop Camera detect faces, smiles or eyes.

Practical Work stage II

Exploring the multiple haar cascade filters, identify faces in pictures and videos.
With such technique we can guess if the image/video is illustrating happiness or not.