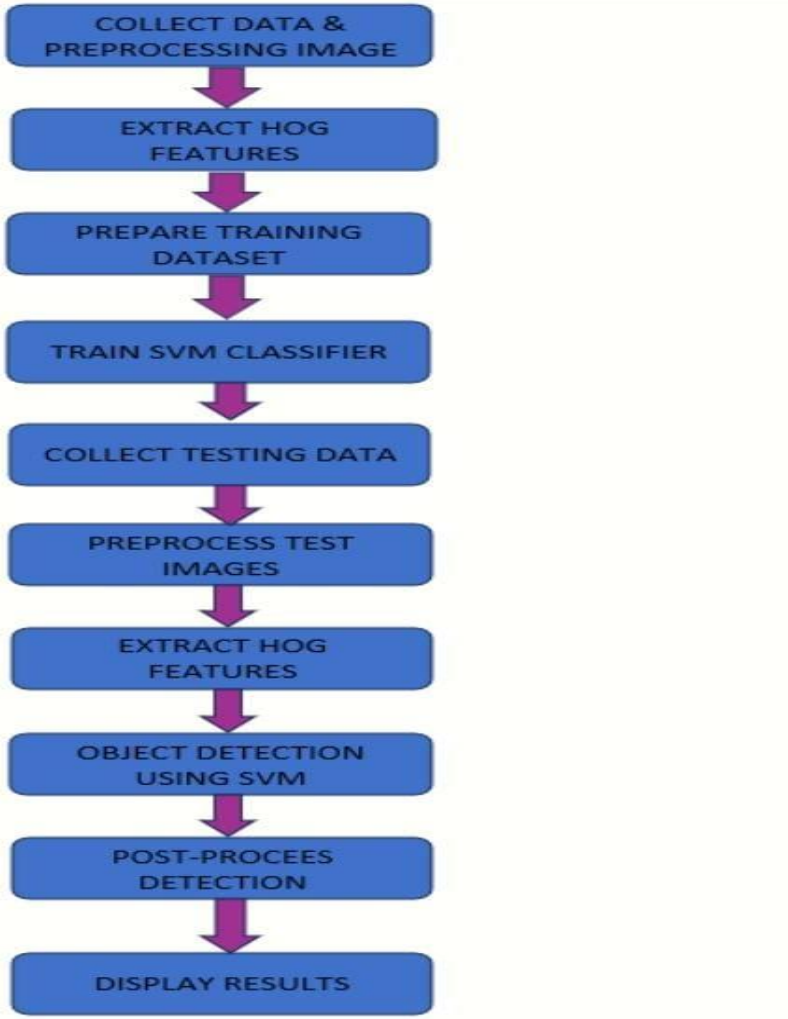
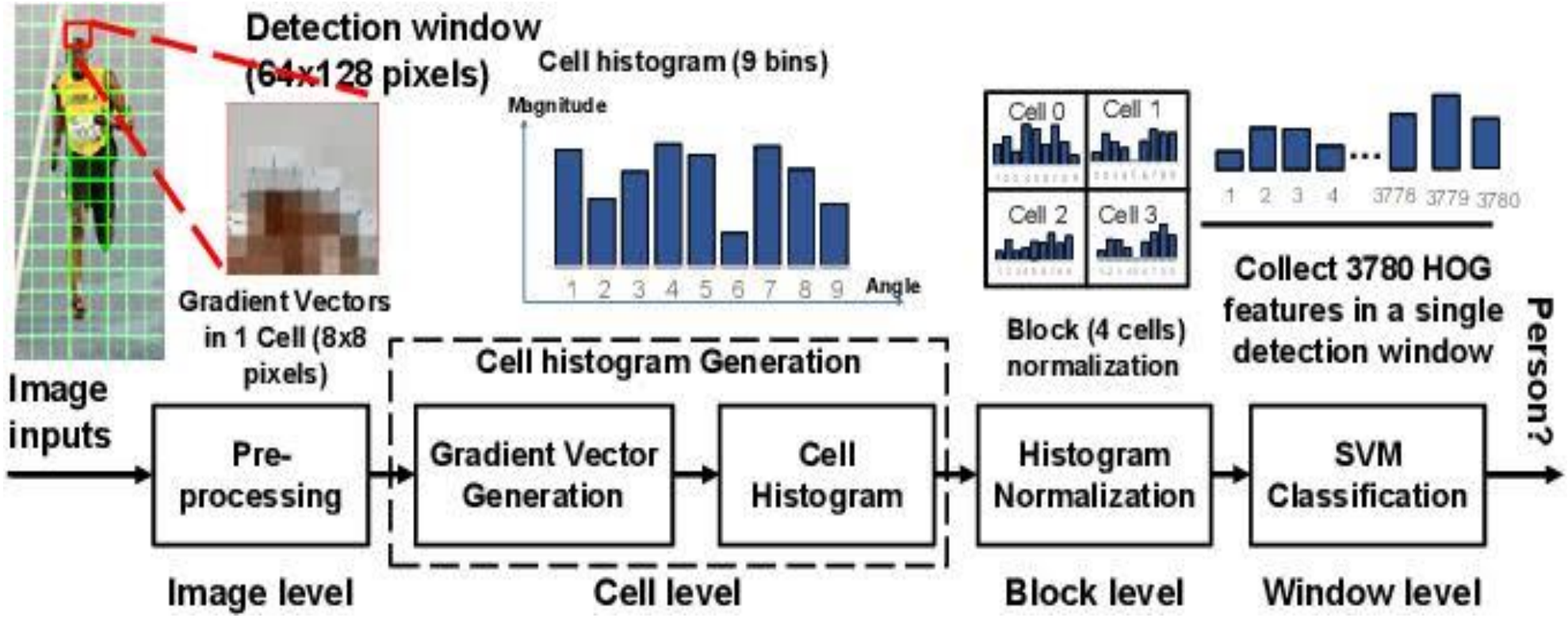
Object Detection Using SVM with HOG Features

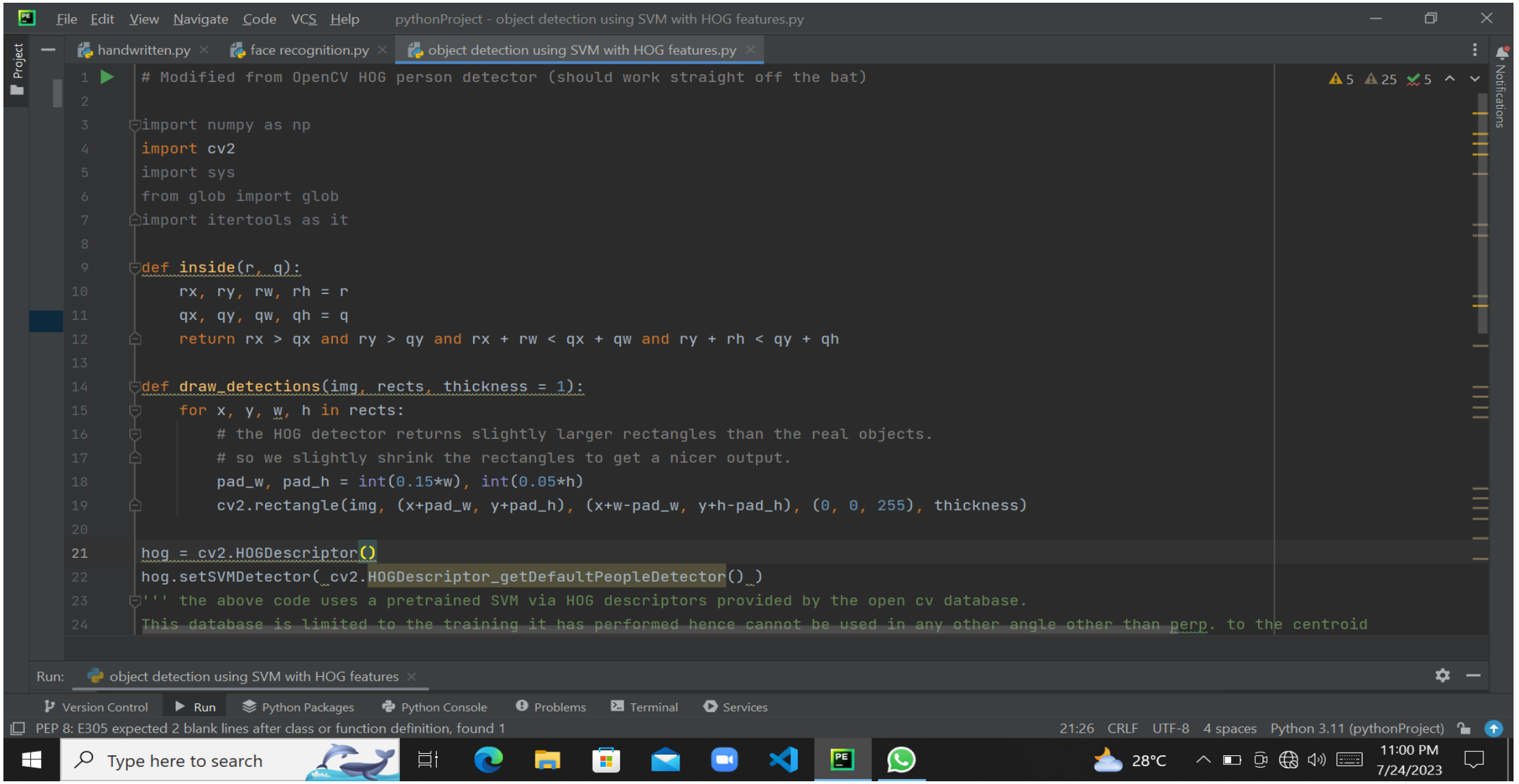
Flow Chart

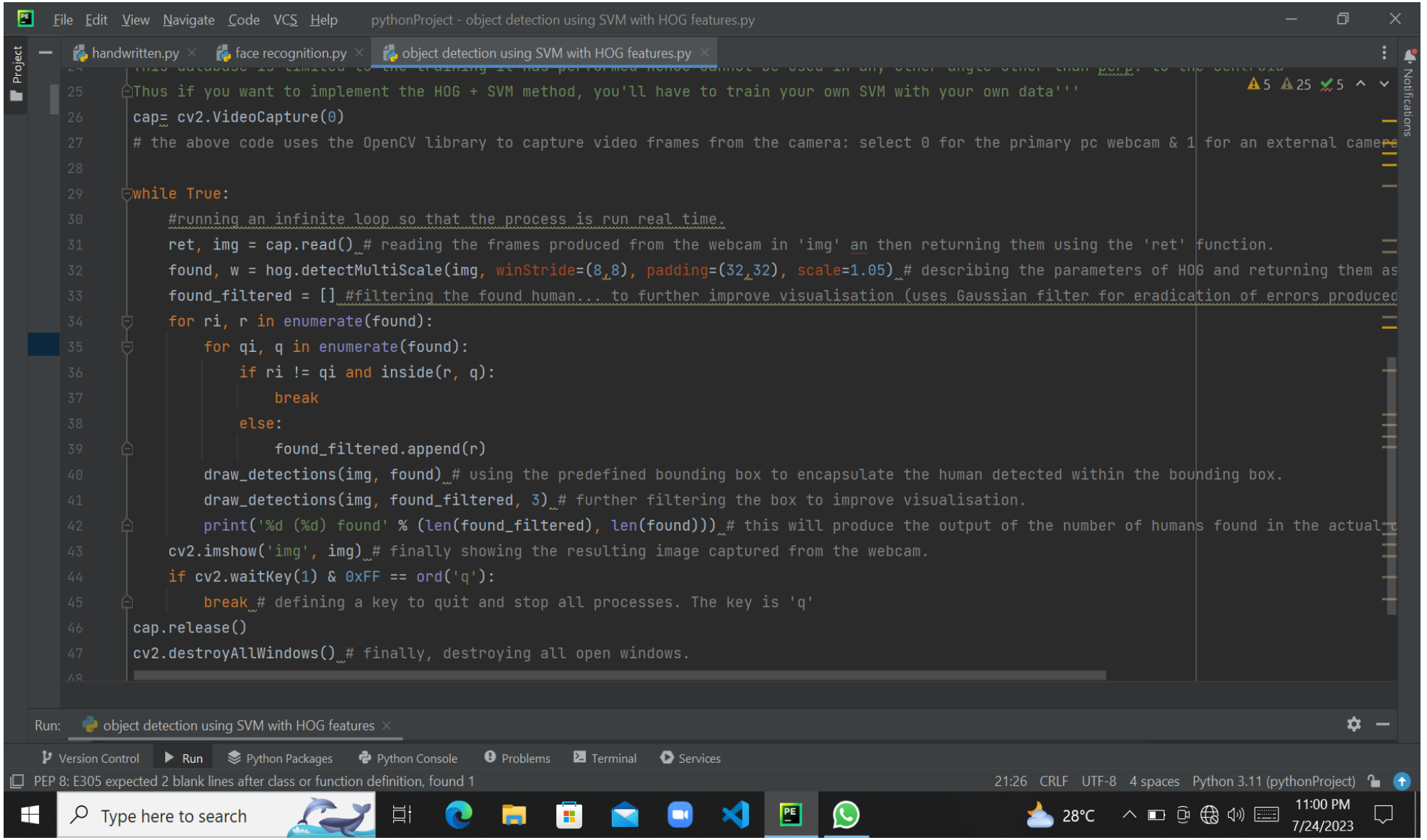

COLLECT DATA & PREPROCESSING IMAGE
EXTRACT HOG FEATURES
PREPARE TRAINING DATASET
TRAIN SVM CLASSIFIER
COLLECT TESTING DATA
PREPROCESS TEST IMAGES
EXTRACT HOG FEATURES
OBJECT DETECTION USING SVM
POST-PROCEES DETECTION
DISPLAY RESULTS

Architecture Diagram



Program Code

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pythonProject - object detection using SVM with HOG features.py
handwritten.py
face recognition.py
object detection using SVM with HOG features.py
Project
Notifications
Thus if you want to implement the HOG + SVM method, you'll have to train your own SVM with your own data'''
cap= cv2.VideoCapture(0)
# the above code uses the OpenCV library to capture video frames from the camera: select 0 for the primary pc webcam & 1 for an external camera
while True:
#running an infinite loop so that the process is run real time.
ret, img = cap.read() # reading the frames produced from the webcam in 'img' an then returning them using the 'ret' function.
found, w = hog.detectMultiScale(img, winStride=(8,8), padding=(32,32), scale=1.05) # describing the parameters of HOG and returning them as
found_filtered = [] #filtering the found human... to further improve visualisation (uses Gaussian filter for eradication of errors produced
for ri, r in enumerate(found):
for qi, q in enumerate(found):
if ri != qi and inside(r, q):
break
else:
found_filtered.append(r)
draw_detections(img, found) # using the predefined bounding box to encapsulate the human detected within the bounding box.
draw_detections(img, found_filtered, 3) # further filtering the box to improve visualisation.
print('%d (%d) found' % (len(found_filtered), len(found))) # this will produce the output of the number of humans found in the actual
cv2.imshow('img', img) # finally showing the resulting image captured from the webcam.
if cv2.waitKey(1) & 0xFF == ord('q'):
break # defining a key to quit and stop all processes. The key is 'q'
cap.release()
cv2.destroyAllWindows() # finally, destroying all open windows.
Run: object detection using SVM with HOG features
Version Control
Run
Python Packages
Python Console
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Terminal
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PEP 8: E305 expected 2 blank lines after class or function definition, found 1
21:26 CRLF UTF-8 4 spaces Python 3.11 (pythonProject)
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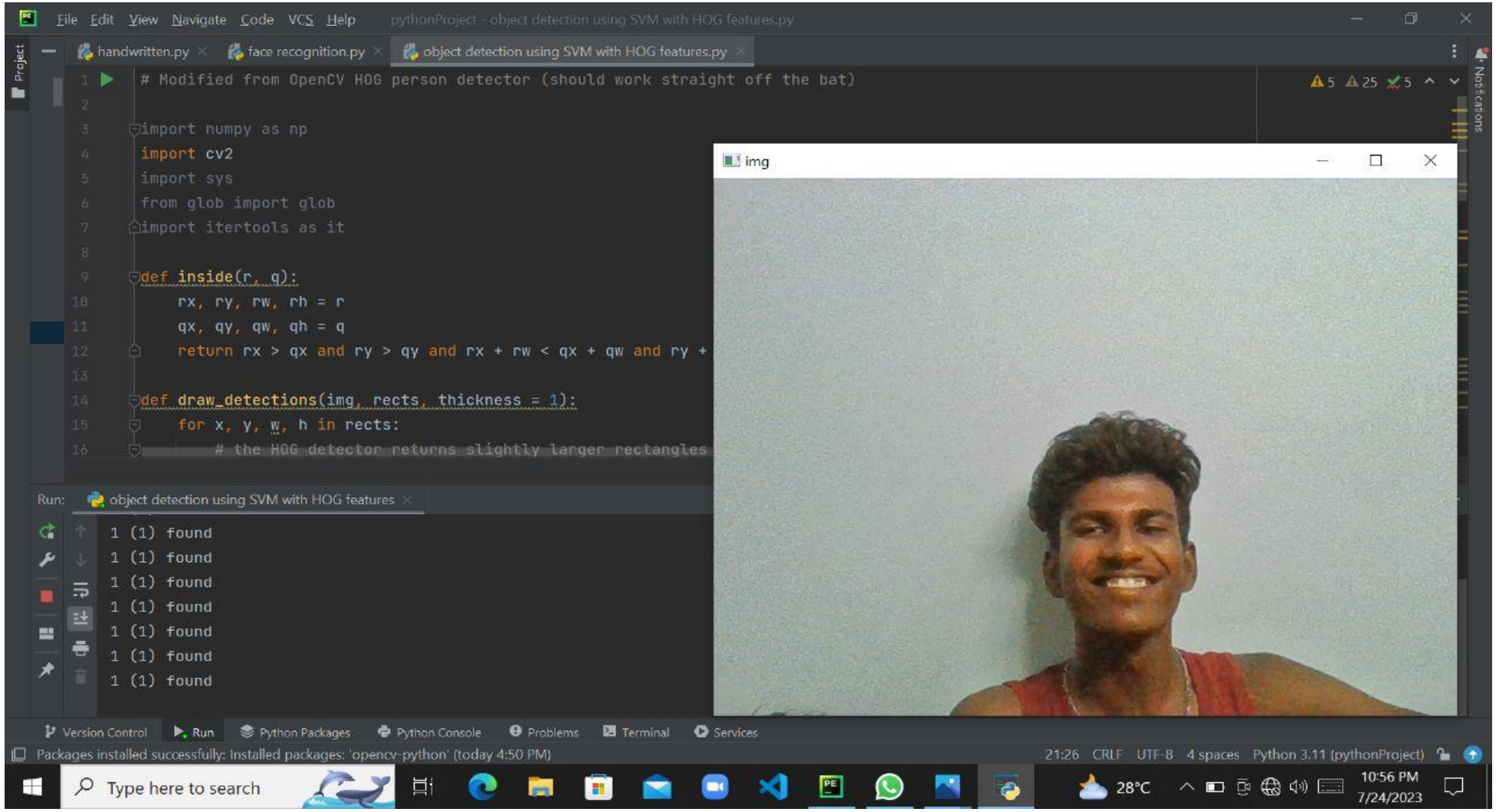
Output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# Modified from OpenCV HOG person detector (should work straight off the bat)
import numpy as np
import cv2
import sys
from glob import glob
import itertools as it
def inside(r, q):
rx, ry, rw, rh = r
qx, qy, qw, qh = q
return rx > qx and ry > qy and rx + rw < qx + qw and ry +
def draw_detections(img, rects, thickness = 1):
for x, y, w, h in rects:
# the HOG detector returns slightly larger rectangles
img
Run: object detection using SVM with HOG features
1 (1) found
1 (1) found
1 (1) found
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1 (1) found
1 (1) found
1 (1) found
Version Control
Run
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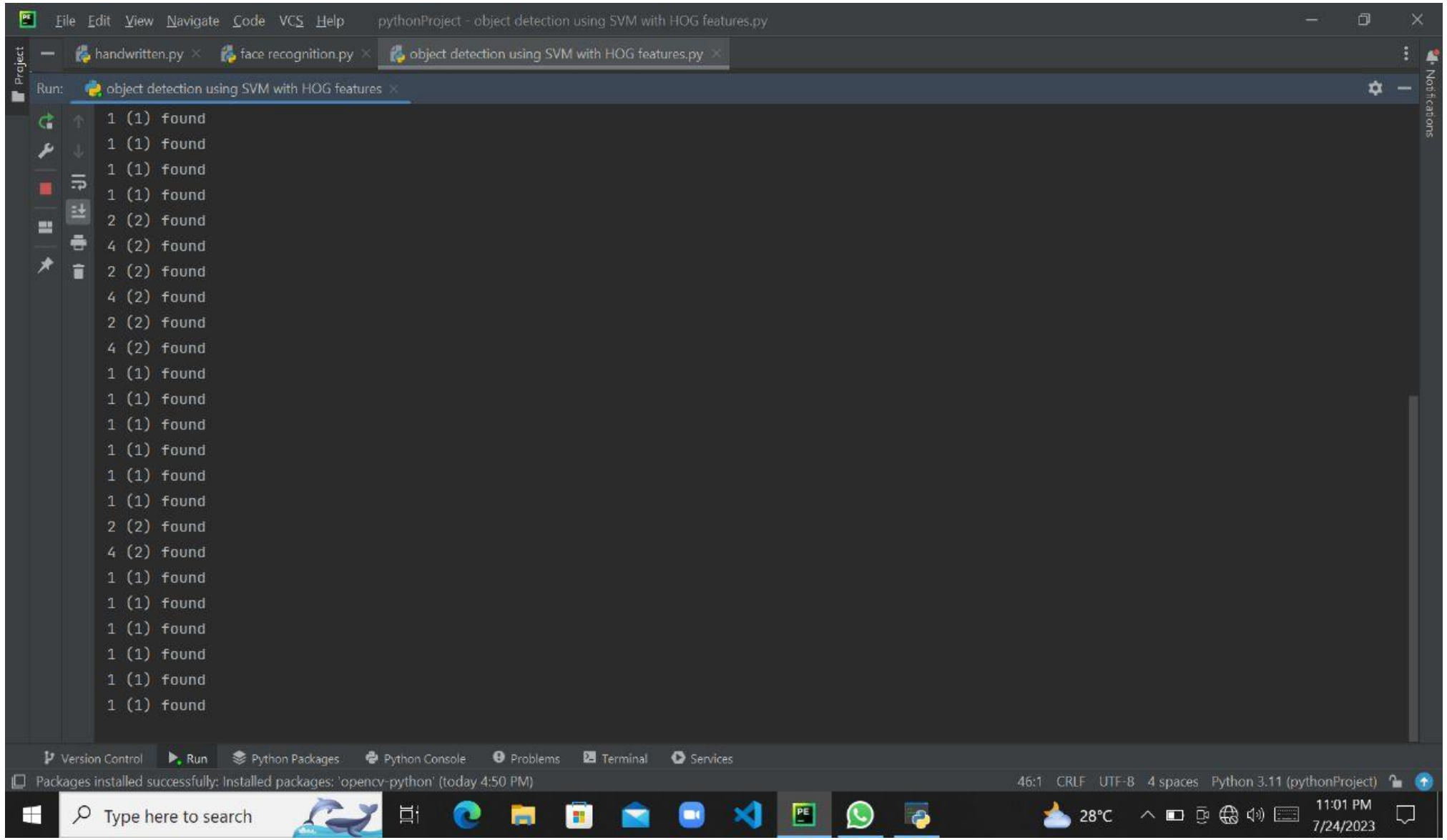
File Edit View Navigate Code VCS Help
pythonProject - object detection using SVM with HOG features.py
handwritten.py
face recognition.py
object detection using SVM with HOG features.py
Run:
object detection using SVM with HOG features
1 (1) found
1 (1) found
1 (1) found
1 (1) found
2 (2) found
4 (2) found
2 (2) found
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2 (2) found
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Version Control
Run
Python Packages
Python Console
Problems
Terminal
Services
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46:1 CRLF UTF-8 4 spaces Python 3.11 (pythonProject)
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