

PROJECT DEVELOPMENT PHASE

SPRINT - 2

Date	30 October 2022
Team ID	PNT2022TMID27502
Project Name	Project -VirtualEye - Life Guard for Swimming Pools to Detect Active Drowning

```
import cvlib as cv
from cvlib.object_detection
import draw_bbox
import cv2
import time
import numpy as np
#for PiCamera
#from picamera Import PiCamera
#camera = PiCamera
#camera.start_preview() #
open webcam
```

```
webcam = cv2.VideoCapture(0)
```

```
if not webcam.isOpened():
print("Could not open webcam")
exit()
```

```
t0 = time.time() #gives time in seconds after 1970
```

```
#variable dcount stands for how many seconds the person has been
standing still for
```

```
centre0 = np.zeros(2) isDrowning = False
```

```
#this loop happens approximately every 1 second, so if a person
doesn't move,
#or moves very little for 10seconds, we can say they are drowning
```

```
#loop through frames
```

```
while webcam.isOpened():
```

```

    # read frame from webcam
status, frame = webcam.read()

    if not status:
print("Could not read frame")
exit()

    # apply object detection
bbox, label, conf = cv.detect_common_objects(frame)
#simplifying for only 1 person

    s = (len(bbox), 2)

    if len(bbox)>0:
        bbox0 = bbox[0]
#centre = np.zeros(s)
centre = [0,0]

#for i in range(0, len(bbox)):
#centre[i] = [(bbox[i][0]+bbox[i][2])/2, (bbox[i][1]+bbox[i][3])/2 ]
centre = [(bbox0[0]+bbox0[2])/2, (bbox0[1]+bbox0[3])/2 ]
        #make vertical and horizontal movement variables
hmov = abs(centre[0]-centre0[0])          vmov =
abs(centre[1]-centre0[1])

        #there is still need to tweek the threshold
        #this threshold is for checking how much the centre has
moved          x=time.time()

        threshold = 10
    if(hmov>threshold or vmov>threshold):
print(x-t0, 's')          t0 = time.time()
isDrowning = False          else:

        print(x-t0, 's')
    if((time.time() - t0) > 10):
isDrowning = True

        #print('bounding box: ', bbox, 'label: ' label
,'confidence: ' conf[0], 'centre: ', centre)
#print(bbox,label ,conf, centre)
print('bbox: ', bbox, 'centre:', centre, 'centre0:', centre0)
print('Is he drowning: ', isDrowning)

```

```

        centre0 = centre
        # draw bounding box over detected objects

out = draw_bbox(frame, bbox, label, conf,isDrowning)

        #print('Seconds since last epoch: ', time.time()-t0)
        # display output      cv2.imshow("Real-time
object detection", out)

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

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

```