

Project Development Phase Sprint-3

Date	12 November 2022
Team ID	PNT2022TMID52387
Project Name	Virtual Eye - Life Guard for Swimming Pools toDetect Active Drowning
Maximum Marks	4 Marks

```
import re
import numpy as np
import os
from flask import Flask, app, request, render_template, redirect, url_for
from tensorflow.keras import models
from tensorflow.keras.models import load_model
from tensorflow.keras.preprocessing import image
from tensorflow.python.ops.gen_array_ops import concat
import cvlib as cv
from cvlib.object_detection import draw_bbox
import cv2
import time
from playsound import playsound
import requests

#Loading the model

from cloudant.client import Cloudant

# Authenticate using an IAM API key
client = Cloudant.iam('57f444d5-dfbd-4fc0-b752-dea54005c3cc-
bluemix','HTLp9_GkWGDyMR9VHruMMwi_qzZ43qaI3UVR77GOI2GX', connect=True)

# Create a database using an initialized client
my_database = client.create_database('my_database')

app=Flask(__name__)

#default home page or route
@app.route('/')
def index():
    return render_template('index.html')

@app.route('/index.html')
def home():
    return render_template("index.html")
```

```

#registration page
@app.route('/register')
def register():
    return render_template('register.html')

@app.route('/afterreg', methods=['POST'])
def afterreg():
    x = [x for x in request.form.values()]
    print(x)
    data = {
        '_id': x[1], # Setting _id is optional
        'name': x[0],
        'psw': x[2]
    }
    print(data)

    query = {'_id': {'$eq': data['_id']}}

    docs = my_database.get_query_result(query)
    print(docs)

    print(len(docs.all()))

    if(len(docs.all())==0):
        url = my_database.create_document(data)
        #response = requests.get(url)
        return render_template('register.html', pred="Registration Successful, please
login using your details")
    else:
        return render_template('register.html', pred="You are already a member,
please login using your details")

#login page
@app.route('/login')
def login():
    return render_template('login.html')

@app.route('/afterlogin', methods=['POST'])
def afterlogin():
    user = request.form['_id']
    passw = request.form['psw']
    print(user, passw)

    query = {'_id': {'$eq': user}}

    docs = my_database.get_query_result(query)
    print(docs)

```

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print(len(docs.all()))

if(len(docs.all())==0):
    return render_template('login.html', pred="The username is not found.")
else:
    if((user==docs[0][0]['_id'] and passw==docs[0][0]['psw'])):
        return redirect(url_for('prediction'))
    else:
        print('Invalid User')

@app.route('/logout')
def logout():
    return render_template('logout.html')

@app.route('/prediction')
def prediction():
    return render_template('prediction.html')

@app.route('/result',methods=["GET","POST"])
def res():
    webcam = cv2.VideoCapture('drowning.mp4')

    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()
        #print(frame)
        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
#print('bbox',bbox)
#print('label',label)
#print('conf',conf)

#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
#print('came here')
out = draw_bbox(frame, bbox, label, conf,colors=None,write_conf=isDrowning)

#print('Seconds since last epoch: ', time.time()-t0)

```

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# display output
cv2.imshow("Real-time object detection", out)
if(isDrowning == True):
    playsound('alarm.mp3')
    webcam.release()
    cv2.destroyAllWindows()
    #return render_template('prediction.html',prediction="Emergency !!! The
    Person is drowning")
    #return render_template('base.html')

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

# release resources
webcam.release()
cv2.destroyAllWindows()
return render_template('prediction.html',prediction="Emergency !!! The Person is
drowning")

""" Running our application """
if __name__ == "__main__":
    app.run(debug=False)

```

The screenshot shows a code editor with a Python script and a terminal window. The Python script is a Flask application that uses OpenCV for object detection and plays a sound when a person is detected drowning. The terminal window shows the output of the application, including the Flask app's startup logs and the object detection results.

```

1 import re
2 import numpy as np
3 import os
4 from flask import Flask, app, request, render_template, redirect, url_for
5 from tensorflow.keras import models
6 from tensorflow.keras.models import load_model
7 from tensorflow.keras.preprocessing import image
8 from tensorflow.python.ops.gen_array_ops import concat
9 import cvlib as cv
10 from cvlib.object_detection import draw_bbox
11 import cv2
12 import time
13 from playsound import playsound
14 import requests
15
16 #loading the model
17
18 from cloudant.client import Cloudant
19
20 # Authenticate using an IBM API key
21 client = Cloudant iam('5f7444d5-dfd4-4fc0-b752-dca54805c3cc-bluemix', 'http9_0k60y989khuwvwt_gz43q3UwR77G0I26X', connect=True)
22
23
24 # Create a database using an initialized client
25 my_database = client.create_database('my_database')
26
27 app=Flask(__name__)
28
29 #default home page or route
30 @app.route("/")
31 def index():
32     return render_template("index.html")
33
34 @app.route("/index.html")
35 def home():
36     return render_template("index.html")
37
38 #registration page
39 @app.route("/register")
40 def register():
41     return render_template("register.html")
42
43 @app.route("/afterreg", methods=['POST'])
44 def afterreg():
45     x = [x for x in request.form.values()]
46     print(x)
47     data = {}
48     data['id'] = x[1], # Setting id is optional
49     data['name'] = x[2],
50     data['pw'] = x[3]
51     print(data)
52
53 query = {'_id': ['$eq': data['_id']]}
54 docs = my_database.get_query_result(query)
55 print(docs)
56

```

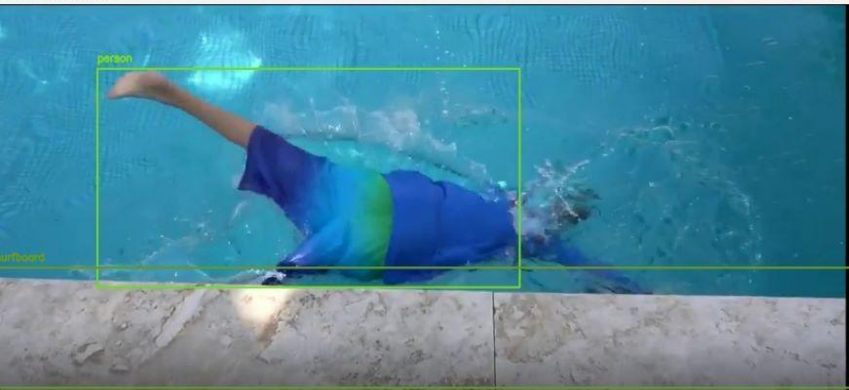
The terminal window shows the following output:

```

In [1]: runfile('C:/Users/Subash V/Desktop/51-GuidedProject-322143-1664773867-main/
GuidedProject-322143-1664773867-main/app.py', wdir='C:/Users/Subash V/Desktop/51-
GuidedProject-322143-1664773867-main/51-GuidedProject-322143-1664773867-main')
2022-11-12 21:32:54.529155: W tensorflow/stream_executor/platform/default/dso_loader
Could not load dynamic library 'cudart64_110.dll'; dlerror: cudart64_110.dll not fo
und
2022-11-12 21:32:54.529486: I tensorflow/stream_executor/cuda/cudart_stub.cc:29] Ig
nored dlerror if you do not have a GPU set up on your machine.
* Serving Flask app "app" (lazy loading)
* Environment: production
  Use a production WSGI server instead.
  * Debug mode: off
* Running on http://127.0.0.1:2000 (press CTRL-C to quit)
127.0.0.1 - - [12/Nov/2022 21:33:22] "GET / HTTP/1.1" 200 -
127.0.0.1 - - [12/Nov/2022 21:33:22] "GET /index.html HTTP/1.1" 404 -
127.0.0.1 - - [12/Nov/2022 21:33:26] "GET /login HTTP/1.1" 200 -
Subashraina2001@gmail.com Subash@2001
cloudant.result.QueryResult object at 0x00000178A304A190:
1
127.0.0.1 - - [12/Nov/2022 21:33:30] "GET /prediction HTTP/1.1" 302 -
127.0.0.1 - - [12/Nov/2022 21:33:30] "GET /prediction HTTP/1.1" 200 -
1.3480906658813477 s
bbox: [[184, 185, 807, 384], [10, 363, 1258, 538]] centre: [455.5, 244.5] centreB:
Is he drowning: False
0.4450934922894843 s

```

Real-time object detection



person

software

```
20 #default view page on route
21 @app.route('/')
22 def index():
23     return render_template("index.html")
24
25 @app.route("/index.html")
26 def home():
27     return render_template("index.html")
28
29 #Registration page
30 @app.route("/register")
31 def register():
32     return render_template("register.html")
33
34 @app.route("/afterreg", methods=['POST'])
35 def afterreg():
36     x = [x for x in request.form.values()]
37     print(x)
38     data = {
39         'id': x[1], # setting _id is optional
40         'name': x[0],
41         'psw': x[2]
42     }
43     print(data)
44     query = {'_id': {'$eq': data['_id']}}
45     docs = my_database.get_query_result(query)
46     print(docs)
```

Value

Web Variable Explorer: Photo Files

Console JavaScript

```
.....
bboxes: [[149, 89, 798, 394], [9, 365, 1274, 539]] centre: [469.5, 241.0] centre0: [470.0, 240.5]
Is he drowning: False
2.4292216380964355 s
bboxes: [[149, 89, 787, 393], [0, 382, 1276, 539]] centre: [468.0, 240.5] centre0: [469.5, 241.0]
Is he drowning: False
2.717088599698242 s
bboxes: [[149, 89, 798, 393], [5, 383, 1283, 539]] centre: [469.0, 241.0] centre0: [468.0, 240.5]
Is he drowning: False
3.015932559967041 s
bboxes: [[149, 89, 781, 393], [5, 381, 1278, 538]] centre: [469.5, 241.0] centre0: [469.0, 241.0]
Is he drowning: False
3.303864062227783 s
bboxes: [[147, 89, 794, 392], [2, 381, 1284, 538]] centre: [469.0, 241.0] centre0: [469.5, 241.0]
Is he drowning: False
3.613157085241577 s
bboxes: [[148, 89, 788, 393], [-1, 381, 1281, 538]] centre: [468.0, 241.0] centre0: [469.0, 241.0]
Is he drowning: False
3.92257201702491 s
bboxes: [[147, 89, 788, 393], [-4, 364, 1284, 536]] centre: [467.5, 241.0] centre0: [468.0, 241.0]
Is he drowning: False
4.242525431777934 s
bboxes: [[147, 88, 787, 392], [-14, 357, 1298, 538]] centre: [467.0, 240.0] centre0: [467.5, 241.0]
Is he drowning: False
```