Sprint-3 Source code

Date	17 Nov 2022
Team ID	PNT2022TMID34450
Project Name	Virtual Eye - Life Guard For Swimming Pools To Detect Active Drowning

DETECTION.PY

```
import cvlib as cv
from cvlib.object_detection import draw_bbox
import cv2
import time
import numpy as np
from playsound import playsound
#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)
 if(isDrowning == True):
 playsound('alarm.mp3')
 # press "Q" to stop
 if cv2.waitKey(1) & 0xFF == ord('q'):
 break
# release resources
webcam.release()
cv2.destroyAllWindows(
```

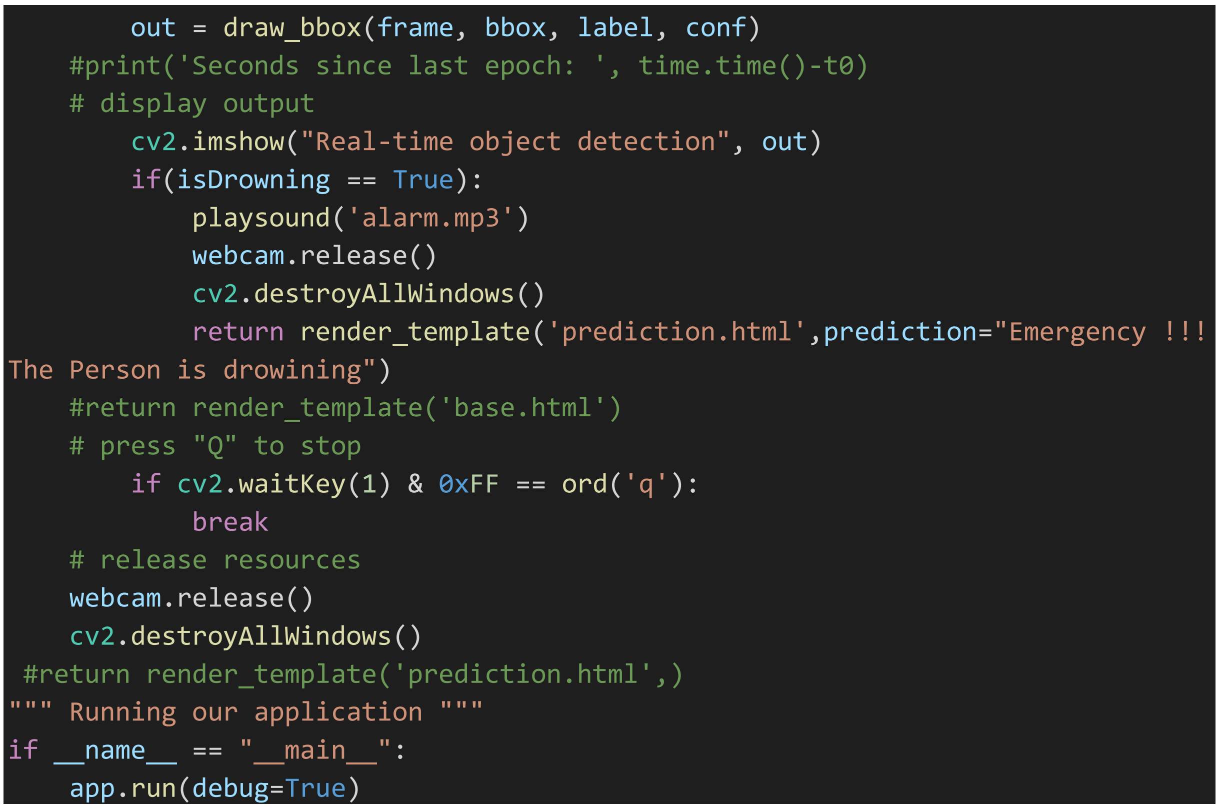
App.py

```
import time
```

```python
import cv2
import numpy as np
from cloudant.client import Cloudant
from flask import Flask, request, render_template, redirect, url_for
from playsound import playsound
import cvlib as cv
from cvlib.object_detection import draw_bbox
# Loading the model
# Authenticate using an IAM API key
client = Cloudant.iam('c7591b18-67f9-4321-80df-2522e5683942-
bluemix','xPQROZL0yOiM7VyTbPJG4t4DxBu670yEpV7NlTBz25ZN', 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")
```

```python
    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)

    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   ")
        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)
    #print('Seconds since last epoch: ', time.time()-t0)
    # 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 drowining")
    #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',)
""" Running our application """
if __name__ == "__main__":
    app.run(debug=True)
```