

Project Report Documentation

VirtualEye - Lifeguard For Swimming Pools To Detect Active Drowning

1. INTRODUCTION

Project overview & Purpose :

Swimming is one of the best exercises that helps people to reduce stress in this urban lifestyle. Swimming pools are found larger in number in hotels, and weekend tourist spots and barely people have them in their house backyard. Beginners, especially, often feel it difficult to breathe underwater which causes breathing trouble which in turn causes a drowning accident. Worldwide, drowning produces a higher rate of mortality without causing injury to children. Children under six of their age are found to be suffering the highest drowning mortality rates worldwide. Such kinds of deaths account for the third cause of unplanned death globally, with about 1.2 million cases yearly. To overcome this conflict, a meticulous system is to be implemented along the swimming pools to save human life.

By studying body movement patterns and connecting cameras to artificial intelligence (AI) systems we can devise an underwater pool safety system that reduces the risk of drowning. Usually, such systems can be developed by installing more than 16 cameras underwater and ceiling and analysing the video feeds to detect any anomalies. but AS a POC we make use of one camera that streams the video underwater and analyses the position of swimmers to assess the probability of drowning, if it is higher than an alert will be generated to attract lifeguards' attention.

Note: The system is not designed to replace a lifeguard or other human monitor, but to act as an additional tool. "It helps the lifeguard to detect the underwater situation where they can't easily observe.

2. LITERATURE SURVEY

Existing Problem :

Safety in water has been a concern for many centuries for the survival of human lives. The latest technology advancements have enabled us to come up with effective drowning detection methods (DDM). A recent report from World Health

Organizations (WHO) gives us some insight into the drowning incidents globally. The number of reported drowning deaths globally is 37200. The highest numbers of deaths are in low and middle-income countries. The survey also points that children have the largest death ratio compared to adults. Majority of the drowning deaths are reported from open water bodies like lakes and sea, and not in pools. In the report WHO has recommended various drowning prevention techniques like constructing fences across the lakes, to prevent accidental fall to teaching school age children swimming as a part of their curriculum in schools.

According to Jeff Ellis and Associates, an International Aquatic Safety and Risk Management Consulting firm, drowning is divided into five stages .

Stage 1 - Shocking surprise:

This initial stage is characterised by the shock of drowning and difficulty in breathing. The person starts to show a higher level of distress and attempts to reach the surface of the water, but in the vertical direction.

Stage 2 - Involuntary Breath Holding:

In this stage the attempt to come to the surface of water stops. He starts involuntary breath holding. Water has entered the mouth, causing the epiglottis to close. The victims gradually become unconscious, as breath is stopped.

Stage 3- Unconsciousness:

The victim becomes unconscious, and the body starts to sink to the bottom of the water. Unless breathing is re-established, the victim remains unconscious.

Stage 4- Hypoxic Convulsions:

The oxygen level in the brain reduces drastically. The victim's skin turns blue, especially in the lips and fingernail beds.

Stage 5- Clinical Death:

Death is the final stage of drowning Any prediction of drowning during the early stages always reduces risks during the rescue operations.

References :

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http://www.who.int/violence_injury_prevention/publications/drowning_global_report/Final_report_full_web.pdf

Ju1 2018 [2] 5 Stages of drowning

<http://www.dedhamhealthfoundation.org/water/victimrecognition/stages-of-drowning/> Ju1 2018 [3] Life Guard Training

<https://public.rcas.org/hs/chs/chshomework/Lists/Swimmi>

[ng/Attachments/805/Life%20Guard%20Training%201.do](https://public.rcas.org/hs/chs/chshomework/Lists/Swimmi) cm Jul 2018

[4] Kingi wearables http://www.kingii.com/kingii_wearable.html Jul 2018

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CN107134116A

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[7] Chi Zhang and Xiaoguang Li, “A Novel Camera-Based Drowning Detection Algorithm”, Proceedings of Advances in Image and Graphics Technologies, Beijing, China, June 2015, pp. 224-233

[8] Lei Fei, Wang Xueli and Chen Dongsheng, “Drowning Detection Based on Background Subtraction”, Proceedings of the National Power Systems Conference (NPSC) - 2018, December 14-16, NIT Tiruchirappalli, India International Conferences on Embedded Software and System, 2009, pp. 341-343

[9] Alvin H. Kam, Wenmiao Lu and Wei-Yun Yau, “A Video-Based Drowning Detection System”, Proceedings of the 7th European Conference on Computer Vision-Part IV, Copenhagen, Denmark, May 2002, pp. 297-311

[10] Average breath holding time <https://www.normalbreathing.com/index-CP-normals.php> Jul 2018 [11] Aboli Kulkarni, Kshitij Lakhani and Shubham Lokhande, “A Survey of Underwater Wireless Communication Technologies”, Journal of communication and information systems, VOL. 31, NO. 1, 2016 page 242 [12] Ian F. Akyildiz, Dario Pompili, Tommaso Melodia, Challenges for efficient communication in underwater acoustic sensor networks, ACM Sigbed Review

1 (2) (2004) 3–8 [13] <https://www.mouser.com/ds/2/813/HCSR04-1022824.pdf>

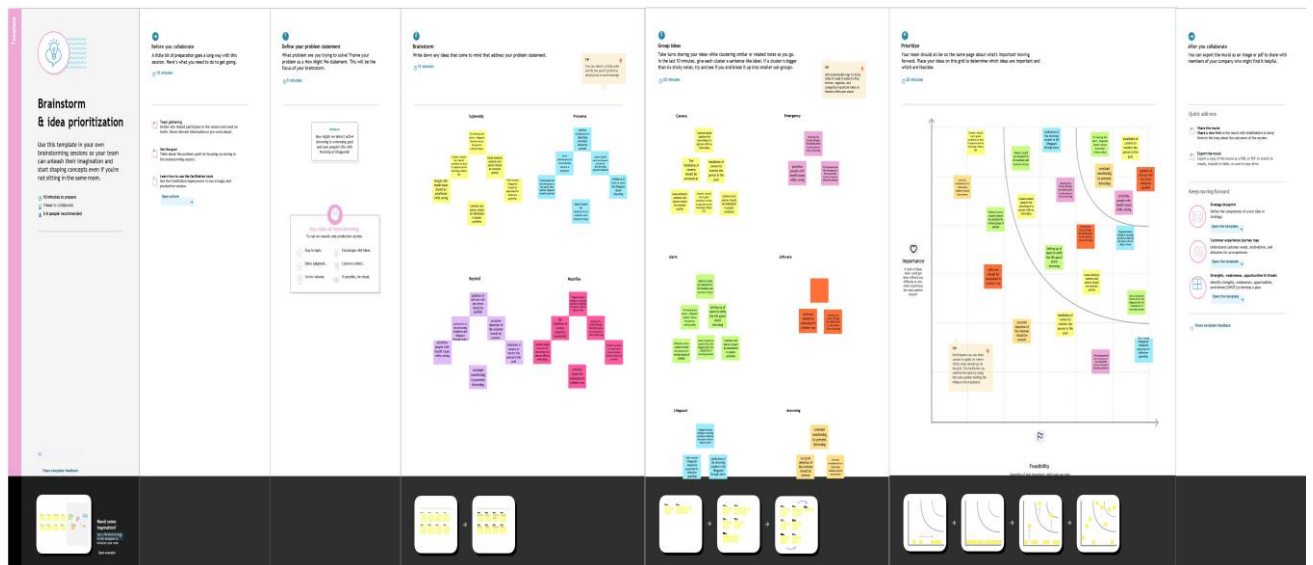
Problem Statement :



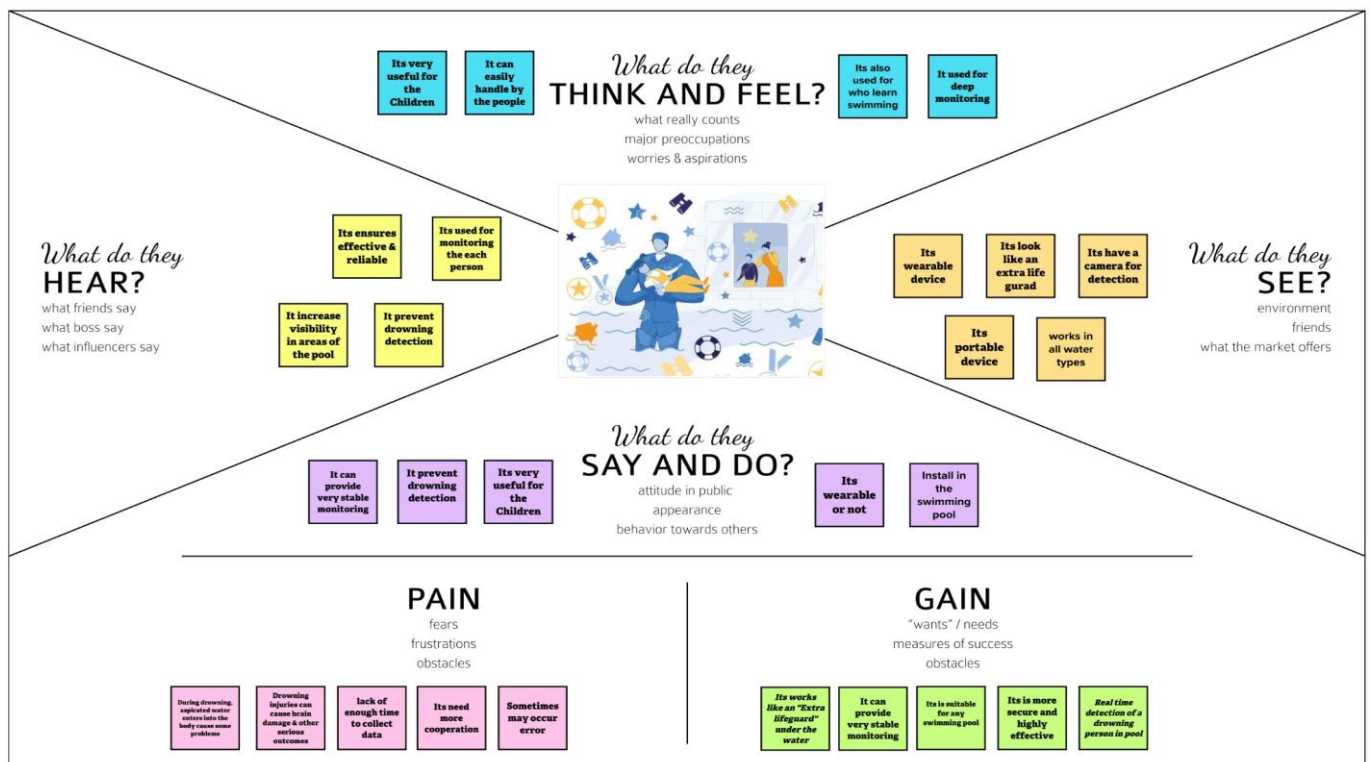
Problem Statement (PS)	I am (Customer)	I'm trying to	But	Because	Which makes me feel
PS-1	Student	Swim in the pool because It builds muscular strength and increases immunity	Not safety in the pool when drowning	No one can monitoring while drowning	Frustration
PS-2	Teacher	Swim in the pool because	I am a beginner	Drowning is going to be the number one	Fear
		swimming is the best exercise		fear for every beginner.	
PS-3	Businessman	Swim in the swimming pool because its give a relaxation	I scare about drowning	I have a breath issue	Disappointment

3. IDEATION & PROPOSED SOLUTION

Ideation & Brainstorming



Empathy Map Canvas





Proposed Solution:

S.No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	Children and Young people like beginners often feel it difficult to breathe underwater which causes breathing trouble which in turn causes a drowning accident.
2.	Idea / Solution description	The camera is connected with (AI) system. It monitoring the every movement of the peoples in the pool.
3.	Novelty / Uniqueness	It is higher then an alert will be generated to attract lifeguard's attention.
4.	Social Impact / Customer Satisfaction	This technology has the advantage of instantly identifying and alerting the person who is drowning in a short amount of time and Its look like an extra life guard. Its used for monitoring the each person.
5.	Business Model (Revenue Model)	<ul style="list-style-type: none"> App and device offered for the customers. Child and People who are beginners to swim is our target customers. They want to tell the benefit of our products to the partners, activities,resources. By selling our device with app the revenue is generated.
6.	Scalability of the Solution	It increase visibility in areas of the pool and Its look like an extra life guard.

Proposed Solution fit:

Problem-Solution fit canvas 2.0		Purpose / Vision	
Define CS, fit into CC	1. CUSTOMER SEGMENT(S) <small>Who is your customer? I.e. working parents of 0-5 y.o. kids</small> CS <p>Anyone who uses a swimming pool including children,adults</p>	6. CUSTOMER CONSTRAINTS <small>What constraints prevent your customers from taking action or limit their choices of solutions? I.e. spending power, budget, no cash, network connection, available devices.</small> CC <p>The only expenditure required is installing highly capable cameras for active drowning detection, and alert-sending devices</p>	5. AVAILABLE SOLUTIONS <small>Which solutions are available to the customers when they face the problem or need to get the job done? What have they tried in the past? What pros & cons do these solutions have? I.e. pen and paper is an alternative to digital notetaking</small> AS <p>Angel Swim Life Gaurd, Swim Eye Life Gaurd etc</p>
	2. JOBS-TO-BE-DONE / PROBLEMS <small>Which jobs to-be-done (or problems) do you address for your customers? There could be more than one; explore different sides.</small> J&P <p>The main job to be done here is to detect accurately the active drowning person.</p>	9. PROBLEM ROOT CAUSE <small>What is the real reason that this problem exists? What is the back story behind the need to do this job? I.e. customers have to do it because of the change in regulations.</small> RC <p>The problems for the Root causes include: * Amature in swimming * Forced Drowning with a willingness * Unknown circumstances</p>	7. BEHAVIOUR <small>What does your customer do to address the problem and get the job done? I.e. directly related: find the right solar panel installer, calculate usage and benefits; indirectly associated: customers spend free time on volunteering work (i.e. Greenpeace)</small> BE <p>Making more secure swimming pools with 24/7 active guarding, with bars installed wherever needed.</p>
Focus on J&P, tap into BE, understand RC	3. TRIGGERS <small>What triggers customers to act? I.e. seeing their neighbour installing solar panels, reading about a more efficient solution in the news.</small> TR <p>The main trigger is the increase of death due to active drowning.</p>	10. YOUR SOLUTION <small>If you are working on an existing business, write down your current solution first, fill in the canvas, and check how much it fits reality. If you are working on a new business proposition, then keep it blank until you fill in the canvas and come up with a solution that fits within customer limitations, solves a problem and matches customer behaviour.</small> SL <p>A device is developed with yono model to detect actively drowning people in the pool which alerts the gaurds.</p>	8. CHANNELS of BEHAVIOUR <small>8.1 ONLINE What kind of actions do customers take online? Extract online channels from #7</small> CH <p>Social Media, Adevtising, Blog</p>
	4. EMOTIONS: BEFORE / AFTER <small>How do customers feel when they face a problem or a job and afterwards? I.e. lost, insecure > confident, in control - use it in your communication strategy & design.</small> EM <p>They feel a sense of loss or fear in water</p>	8.2 OFFLINE <small>What kind of actions do customers take offline? Extract offline channels from #7 and use them for customer development.</small> <p>Friends, Developers.</p>	Extract online & offline CH of BE

 Problem-Solution fit canvas is licensed under a Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 license
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REQUIREMENT ANALYSIS

Functional Requirements:

Following are the functional requirements of the proposed solution.

FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	Installation	First we should Needed to be fixed in the underwater of the swimming pools without creating any disturbance to the people
FR-2	User Registration	Register via Email/Phone number and get verified for further use
FR-3	Deduction	Detect the person in the swimming pool who is either horrified or in an unconscious stage.
FR-4	Support	Take swim tubes or take the help of rescuer
FR-5	Audio system	Send an audio alert via audio system in the swimming pool.
FR-6	Prior Alert	Send alert message to the lifeguard

Non-functional Requirements:

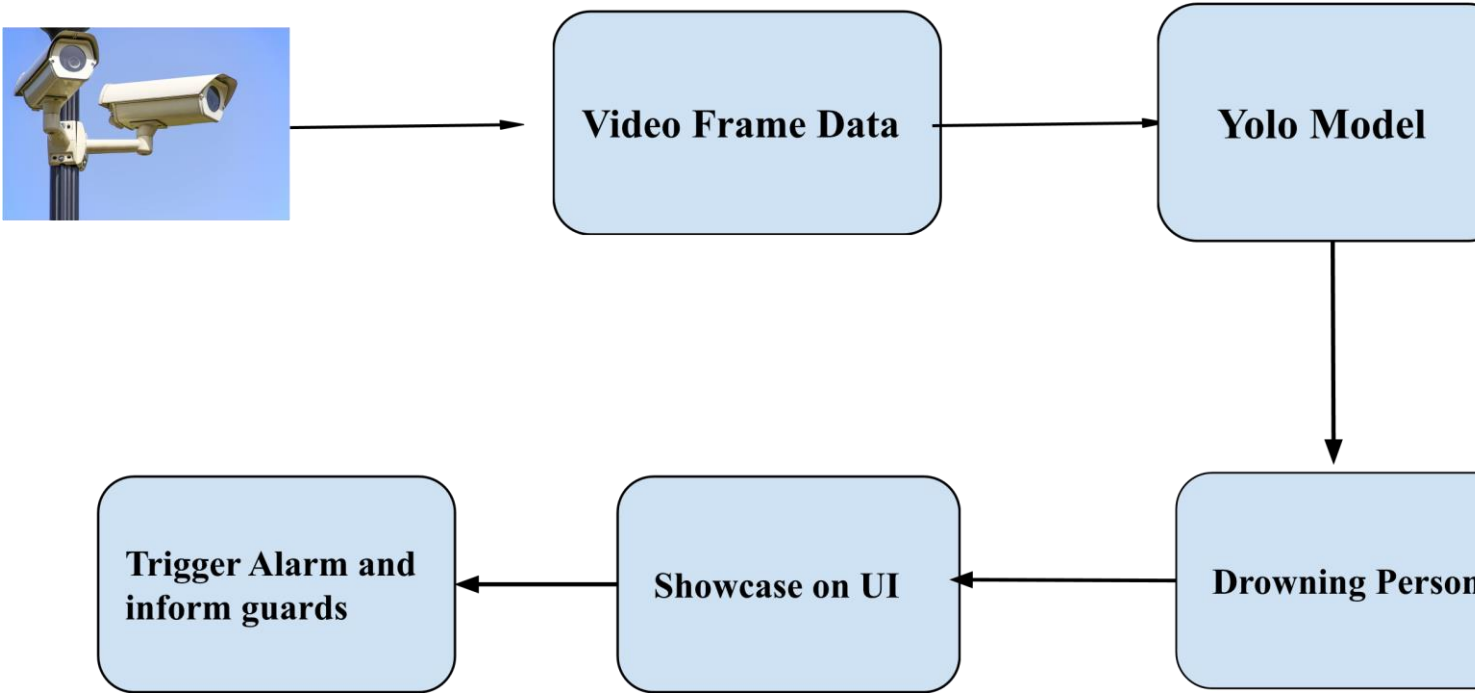
Following are the non-functional requirements of the proposed solution.

FR No.	Non-Functional Requirement	Description
NFR-1	Usability	To ensure the safety of each and every person present in the pool. A Lifeguard should be present all the time in the pool.
NFR-2	Security	Lifeguards should be aware of the alert message to save the life of the swimmer
NFR-3	Reliability	Virtual eye lifeguard triggers an immediate prior alarm if a swimmer is in peril, helping to avoid panic even in critical situations.
NFR-4	Performance	The alarm is triggered when the swimmer's pulse rate is decreasing or increasing
NFR-5	Availability	Equipment include lifesaver rings, rescue tubes, inflatable vests, a Shepherd's Crook, life hooks, spine boards, and first aid kit etc Remember to keep them near the swimming pool.

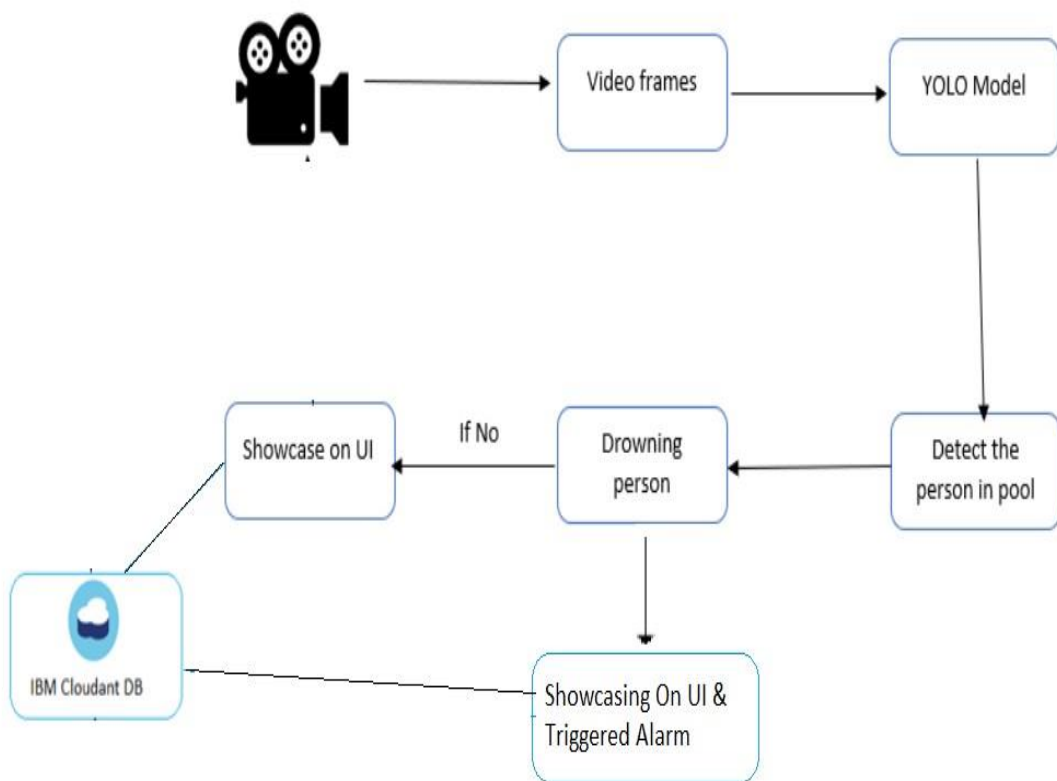
NFR-6	Scalability	Virtual eye lifeguard detects potential drownings and promptly notifies you. It features the latest artificial intelligence Technology , machine learning , deep learning etc and its easily adapts to the user.
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PROJECT DESIGN

Solution Architecture :



TECHNOLOGY ARCHITECTURE :



USER STORIES :

User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance criteria	Priority
Customer (Mobile user)	Installation	USN-1	As a user, I can install the virtual eye - lifeguard drowning system	I can install	High
	Deduction	USN-2	As a user, I will receive confirmation about the drowning detection	I can receive confirmation about detection	High
	Support	USN-3	As a user, I can get the support from the virtual eye system	I can get the support	High
	Prior Alert	USN-4	As a user, I can get the alert when the person is drowning	I can get the alert	High
	Protection	USN-5	As a user , I can save the person from drowning	I can save the person	High
Customer (Web user)					
Customer Care Executive	Customer care	USN-6	As a user, I can contact customer care about the drowning system	I can get the service from customer care	High

Administrat or					
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PROJECT PLANNING & SCHEDULING

S.NO	MILESTONE	DESCRIPTION	DURATION
1	Prerequisites	Prerequisites are all the needs at the requirement level needed for the execution of the different phases of a project.	1 WEEK
2	Create & Configure IBM cloud services	IBM Cloud provides solutions that enable higher levels of compliance, security, and management, with proven architecture patterns and methods for rapid delivery for running mission critical workloads.	2 WEEK
3	Develop the python script	A Python script is a set of commands included in a file that is intended to be run similarly to a program. The concept is that the file will be run or performed from the command line or from within a Python interactive shell to perform a particular activity. Of course, the file includes methods and imports different modules.	1 WEEK

4	Develop web application	A web application (or web app) is application software that runs in a web browser, unlike software programs that run locally and natively on the	3 WEEK
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		operating system (OS) of the device.	
5	Ideation phase	Ideation is the process where you generate ideas and solutions through sessions such as Sketching, Prototyping, Brainstorming, Brain writing, Worst Possible Idea, and a wealth of other ideation techniques.	1 WEEK
6	Project design phases	Project design is an early phase of a project where the project's key features, structure, criteria for success, and major deliverables are planned out. The aim is to develop one or more designs that can be used to achieve the desired project goals.	2 WEEK

7	Project planning phase	In the Planning Phase, the Project Manager works with the project team to create the technical design, task list, resource plan, communications plan, budget, and initial schedule for the project, and establishes the roles and responsibilities of the project team and its stakeholders.	2 WEEK
8	Project development phase	Project development is the process of planning and allocating resources to fully develop a project or product from concept to go-live.	4 WEEK

CODING & SOLUTIONING

```

import re
import numpy as np

import os

from flask import Flask, app, request, render_template
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
from tensorflow.keras.applications.inception_v3 import preprocess_input

```

```

import cvlib as cv
from cvlib.object_detection import draw_bbox
import cv2
import time
import numpy as np
from playsound import playsound
import requests
from flask import Flask, request, render_template, redirect, url_for
#Loading the model

from cloudant.client import Cloudant

# Authenticate using an IAM API key
client = Cloudant.iam('2eb40045-a8d6-450d-9d24-52cc7cbb2810-bluemix', 'Ud0wunTPOI_8h5ZtEqi1IXk1gIKeYLmpUsCn0Ee08T4z', 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']
    password = request.form['psw']
    print(user,password)

    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 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')
        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',)

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

```

Run the Application and Output:

```

1
127.0.0.1 - - [14/Nov/2022 19:16:41] "POST /afterlogin HTTP/1.1" 302 -
127.0.0.1 - - [14/Nov/2022 19:16:41] "GET /prediction HTTP/1.1" 200 -
127.0.0.1 - - [14/Nov/2022 19:16:42] "GET /static/style.css HTTP/1.1" 304 -
127.0.0.1 - - [14/Nov/2022 19:16:42] "GET /static/js/JScript.js HTTP/1.1" 304 -
127.0.0.1 - - [14/Nov/2022 19:16:42] "GET /static/img/second.jpg HTTP/1.1" 304 -
5.816675424575806 s
bbox: [[114, 112, 804, 372]] centre: [459.0, 242.0] centre0: [0. 0.]
Is he drowning: False
4.5444793701171875 s
bbox: [[114, 112, 804, 372]] centre: [459.0, 242.0] centre0: [459.0, 242.0]
Is he drowning: False
8.752950429916382 s
bbox: [[114, 112, 804, 372]] centre: [459.0, 242.0] centre0: [459.0, 242.0]
Is he drowning: False
12.785400867462158 s
bbox: [[120, 112, 800, 372]] centre: [460.0, 242.0] centre0: [459.0, 242.0]
Is he drowning: True

```



ABOUT PROJECT

Problem:

Swimming is one of the best exercises that helps people to reduce stress in this urban lifestyle. Swimming pools are found larger in number in the hotels, weekend tourist spots and barely people have in their house backyard. Beginners, especially often feel it difficult to breathe under water and causes breathing trouble which in turn cause a drowning accident. Worldwide, drowning produces a higher rate of mortality without causing injury to children.

Children are especially at their own risk as they are found to be suffering the highest drowning rate like other small child. Such kind

Solution:

To overcome the conflict, a meticulous system is to be implemented along the swimming pools to save the human life. By studying body movement patterns and connecting cameras to an artificial intelligence (AI) system we can devise an underwater pool safety system that reduces the risk of drowning. Usually such systems can be developed by installing more than 16 cameras underwater and ceiling and analysing the video feeds to detect any anomalies.


Such AI or CCTV system can also be implemented that stores the video under water and analyse the position of swimmers

Register in the website

[Register](#)

Already have an account? [Login](#)

Login with your Credential



Login

After Login

Virtual Eye- Life Guard for Swimming Pools to Detect Active Drowning

Swimming is one of the best exercises that helps people to reduce stress in this urban lifestyle. Swimming pools are found larger in number in the hotels, weekend tourist spots and barely people have in their house backyard. Beginners, especially often feel it difficult to breathe under water and causes breathing trouble which in turn cause a drowning accident. Worldwide, drowning produces a higher rate of mortality without causing injury to children. Children under six of their age are found to be suffering the highest drowning mortality rates worldwide. Such kinds of deaths account for the third cause of unplanned death globally, with about 1.2 million cases yearly.

[Click Me! For a Demo](#)

Output

Virtual Eye

Home

Logout

Virtual Eye- Life Guard for Swimming Pools to Detect Active Drowning

Swimming is one of the best exercises that helps people to reduce stress in this urban lifestyle. Swimming pools are found larger in number in the hotels, weekend tourist spots and barely people have in their house backyard. Beginners, especially often feel it difficult to breathe under water and causes breathing trouble which in turn cause a drowning accident. Worldwide, drowning produces a higher rate of mortality without causing injury to children. Children under six of their age are found to be suffering the highest drowning mortality rates worldwide. Such kinds of deaths account for the third cause of unplanned death globally, with about 1.2 million cases yearly.

Click Me! For a Demo

Emergency !!! The Person is drowning


Copyright © 2021. All Rights Reserved

TESTING

Performance Testing:

Project team shall fill the following information in the model performance testing template.

S.No.	Parameter	Values	Screenshot
1.	Model Summary	-	<div><div>Virtual Eye</div><div><div>Home</div><div>Login</div><div>Register</div><div>Logout</div></div></div> <div><div><div>ABOUT PROJECT</div><div><div>Problem:</div><div>Solving is one of the best exercises that helps people to reduce stress in this urban lifestyle. Swimming pools are found larger in number in the hotels, weekend tourist spots and barely people have in their house backyard. Beginners, especially often feel it difficult to breathe under water and causes breathing trouble which in turn cause a drowning accident. Worldwide, drowning produces a higher rate of mortality without causing injury to children. Children under six of their age are found to be suffering the highest drowning mortality rates worldwide. Such kinds of deaths account for the third cause of unplanned death globally, with about 1.2 million cases yearly.</div></div><div><div>Solution:</div><div>To overcome the difficulty, a revolutionary system is to be implemented along the swimming pools to save the lives of the swimmers by detecting body movement patterns and connecting them to an artificial neural network (ANN) system, which can detect the person who is drowning.</div></div></div></div>

3.	Confidence Score (Only Yolo Projects)	Class Detected - 25 Confidence Score - 50	
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UAT Report

1. Purpose of Document

The purpose of this document is to briefly explain the test coverage and open issues of the [ProductName] project at the time of the release to User Acceptance Testing (UAT).

2. Defect Analysis

This report shows the number of resolved or closed bugs at each severity level, and how they were resolved

Resolution	Severity 1	Severity 2	Severity 3	Severity 4	Subtotal
By Design	1	4	2	3	10
Duplicate	1	0	3	0	4
External	2	3	0	1	6
Fixed	2	2	1	1	6
Not Reproduced	0	0	1	0	1
Skipped	0	0	1	1	2
Won't Fix	0	2	2	1	5
Totals	6	11	10	7	34

3. Test Case Analysis

This report shows the number of test cases that have passed, failed, and untested

Section	Total Cases	Not Tested	Fail	Pass
Print Engine	2	0	0	2
Client Application	2	0	1	1
Security	1	0	0	1
Outsource Shipping	1	0	0	1
Exception Reporting	2	0	1	1

Final Report Output	1	0	0	1
Version Control	1	0	0	1

Test Cases Report

				09-Nov-22			
				PNT2022TMD28664			
				Virtuale eye-Lifeguard for swimming 4 marks			
Test case ID	Feature Type		Test Scenario	Steps TO Execute	Test	Expected Result	Actual Result
	Functional		Verify user is able to see the Login/Signup popup when user clicked on My account button	1.Enter URL and click go 2.Click on My Account dropdown button 3.Verify login/Signup popup displayed or not	Login.html	Login/Signup popup should display	Working as
		Home Page					
LoginPage_TC_002		Home Page	Verify the UI elements in Login/Signup popup	1.Enter URL and click go 2. Click on My Account dropdown 3. Verify login/Signup popup with below UI elements: a.email text box b.password text box c. Login button with orange colour d. New custotner? Create account link e. Last password? Recovery password link	Login.html	Application should show below elements: a.email text box b.password text box c. Login button with orange colour d. New custotner? Create account link e. Last password? Recovery password link	Working as expected
	Functional	Home page	Verify user is able to log into application with Valid credentials	1.Enter URL and click go 2. Click on My Account dropdown 3. Enter Valid username/email in Email text box 4.Enter valid password in password text box 5. Click On in button	Username:tiny@gmail password: tiny27	User should navigate to prediction homepage	working as
	Functional	Login page	Verify user is able to log into application with Invalid credentials	1, Enter URL and click go 2.Click on My Account dropdown button 3.Enter Invalid username/email in Email text box 4.Enter valid password in password text box 5.Click on in button	Username:tiny password:tiny27	Application should show 'Incorrect email or password ' validation message.	working as
LoginPage_TC_004	Functional	Login page	Verify user is able to log into application with Invalid credentials	1-Enter URL and click go 2. Click On My Account dropdown 3. Enter Valid username/email in Email text box 4.Enter Invalid password in password text box 5.Click on in button	username:tiny27@mail password:tiny27	Application should show 'Incorrect email or password ' validation message.	working as
	Functional	Login page	Verify user is able to into application with InValid credentials	1.Enter URL and click go 2. Click on My Account dropdown 3. Enter Invalid username/email in Email text box 4. Enter Invalid password in password text box 5. Click on I in button	username:tiny27@mail password:1803	Application should show 'Incorrect email or password ' validation message.	working as
Predictionpage_TC_00 6	Functional	Prediction Page	Page should display whether the person is drowning or not	1, Camera should take pictures of people swimming in pools 2. It should predict the probability of drowning 3. It should show a bounding box displaying the probability Of drowning	image Of people drowning	generate a alert to lifeguard if people are drowning	Working as

Advantages

It represents an additional level of safety and protection for swimmers. It ensures effective and reliable drowning detection by limiting the number of alarms generated by disturbance factors. Prevents drowning accidents by improving the rescue time of the lifeguards.

Disadvantages

A limitation of this equipment is that if too many swimmers, the occlusion problem arises. The other is that the camera is mounted upon the water, and monitors the Swimmer posture change.

Conclusion

Once we have the working drowning detection model we can feed live video footage of the swimming pool to it so that it can keep detecting continuously for any drowning activities. If drowning is detected it will be highlighted on the system screen as well as alarms will be raised to alert security guards so that they can initiate rescue

FutureScope

The global anti-drowning system market size was valued at USD 67.68 million in 2021. It is projected to reach USD 98.86 million by 2030, growing at a CAGR of 4.3% during the forecast period (2022-2030). The residential segment by application is estimated to grow at a CAGR of 3.9% during the forecast period.

GitHub Link : <https://github.com/IBM-EPBL/IBM-Project-50436-1660909095>

