VIRTUALEYE-LIFE FOR SWIMMING POOLS TO DETECT ACTIVE DROWNING

19/11/2022IBM-3087-1662111730

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TEAM SIZE : 4

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CONTENTS

1.INTRODUCTION

1.1 PROJECT OVERVIEW

In our society there are a lot of accidents happening by swimming pools day by day. This technology was is to reduce a accident

but no significant developments are undertaken for the betterment of these people. VIRTUALEYE-LIFE FOR SWIMMING

POOLS TO DETECT ACTIVE DROWNING with the help of python creating software and finding solution for this incident

should not happen again in pools.

1.*1 purpose*

The project aims to develop a system that converts the sign language into a human hearing voice in the desired language to convey

a message to normal people, as well as convert speech into understandable sign language for people got stuck in water seeking for help

convolutional neural network.An app is built which enables the deaf and dumb people to convey their information using signs which are

converted to human understandable language and output is given as speech.

2. LITERATURE SURVEY

2.1 Existing 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

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.

2.2 References

AngelEye. (2019). AngelEye – Distributors. Retrieved from: https://www.angeleye.it/news. php?id=28&newscat=10 Aquatics International. (2007).

Traumatic Experiences – Should we make our youngest lifeguards come face to face with death? Retrieved from: https://www.aquaticsintl.com/facilities/traumaticexperiences_o British Standards Institution. (2018). BS EN 15288-1, Swimming pools for public use. Safety requirements for design. Retrieved from: https://shop.bsigroup.com/ProductDetail/?pid=000000000030360254 DDS Research Project 17 British Standards Institution 1. (2018). BS EN 15288-2,

 Swimming pools for public use. Safety requirements for operation. Retrieved from: https://shop.bsigroup.com/ProductDetail/?p id=000000000030360257

Drowning Prevention. (2017). The Need. Retrieved from: https://www.drowningprevention.com.au/ German Institute for Standardization. (2019). German national guideline DGfdB R 94.15 "Test methods for camera-based drowning detection systems under operational conditions" (German Association for Public Swimming Pools). Haizhou Li

, Haizhou Li, Kar-Ann Toh and Liyuan L

2.3 Problem Statement Definition

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.

3. IDEATION & PROPOSED SOLUTION

3.1 Empathy Map Canvas

What do they
HEAR?
what friends say
what boss say
what influencers say

whether it will actively detect the drowining of individuals?

whether the drowning detection is realtime?

how artificial intelligence work in detecting drowning?

Wha
THINK
wha
major
worr

It has high accurate results in drowning

It sends alerts

It detects and rescues individuals

It has automated and manual alert systems

It is built using standard technologies.

AI based drowning detection

Expensive and valuable safety system.

Wha
SAY
atti
a
behavi

PAIN
fears
frustrations
obstacles

Costly installation

Rescue team must be available

Availability of emergency kits

3.2 Ideation & Brainstorming

3.3 Proposed Solution

S.No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	Virtual eye Lifeguard is a drowning detection sy... detects every dangerous situation and accident. ... detection of a drowning person in swimming p... challenging task that requires an accurate system.
2.	Idea / Solution description	In this application with using some advanced tec... we can identify if anyone is drowning in a live ... and then send an alert immediately.
3.	Novelty / Uniqueness	The system is not designed to replace a lifeguar... human monitor, but to act as an additional tool. It... lifeguard to detect the underwater situation where ... easily observe.
4.	Social Impact / Customer Satisfaction	Lifeguards can provide life vests to chil... inexperienced swimmers to help them stay aflo... water.
5.	Business Model (Revenue Model)	Can generate revenue from direct customers, like ... and collaborate with maritime sector and other S... pool authorities.
6.	Scalability of the Solution	The Virtual Eye Life Guard system is able to reco... activities in the pools and to classify critical situat... normal ones in order to keep track of what happ... Guard meets the legislative requirements for the pro... personal data.

3.4 Problem Solution fit

1. CUSTOMER SEGMENT(S)

CS

Every candidate attending a National Pool Lifeguard Qualification (NPLQ) course must be 16-years-old and jump or dive into deep water. swim 50 metres in less than 60 seconds. The average age of an employed certified lifeguard is 26 year old.

6. CUSTOMER CONSTRAINTS

In this a best Pulse Rate
rate of every swimmer it
accident .

2. PROBLEMS

J&P

- Beginners, often feel it difficult to breathe underwater which causes breathing trouble which in turn causes a drowning accident in swimming pool
- As water is much denser than air, so there is much more resistance preventing people from being able to move through it quickly and freely so sometimes even the experienced people will find difficulty to swim .

.

9. PROBLEM ROOT CAUS

- The main problem is an
  after the person is drow

- however, they cannot
  down

3. TRIGGERS

TR

1. Detect the pulse Rate of swimmer
2. Send an alert message to the LIfeGuard
3. Helpful for earlier prediction of drowning

10. YOUR SOLUTION

- Swimming is one of the bes
  but because of certain reaso
  place
- In our project we used puls
  chance for earlier prediction
  accident.

4. EMOTIONS: BEFORE / AFTER

EM

Before the detection of active drowning there were many drowning accident worldwide after this ,they can only save the drowning person after he/she is drowned down by sending an alert to Lifeguard

4. REQUIREMENT ANALYSIS

4.1 Functional Requirements

Functional Requirements:

Following are the functional requirements of the pr

FR No.	Functional Requirement (Epic)	Sub R
FR-1	Installation	Need any di
FR-2	Detection	Either
FR-3	Audio	Ask fo
FR-4	Support	Take s
FR-5	Pulse Rate Sensor	Detec
FR-6	Prior Alert	Send

4.2 Non-Functional requirements

Non-functional Requirements:

Following are the non-functional requirements of the

FR No.	Non-Functional Requirement		Des
NFR-1	Usability		To pre all t
NFR-2	Security		Life sav
NFR-3	Reliability		Virt alar eve
NFR-4	Performance		The rate
NFR-5	Availability		Equ infl spir Ren son
NFR-6	Scalability		It d you tec

5. PROJECT DESIGN

5.1 Data Flow Diagram

Data Flow Diagrams:

A Data Flow Diagram (DFD) is a traditional visual representation of the in[f]
amount of the system requirement graphically. It shows how data enters a[nd]
stored.

Live camera feed — Frames — Y[O]

No

Log to Database

Lifeguard
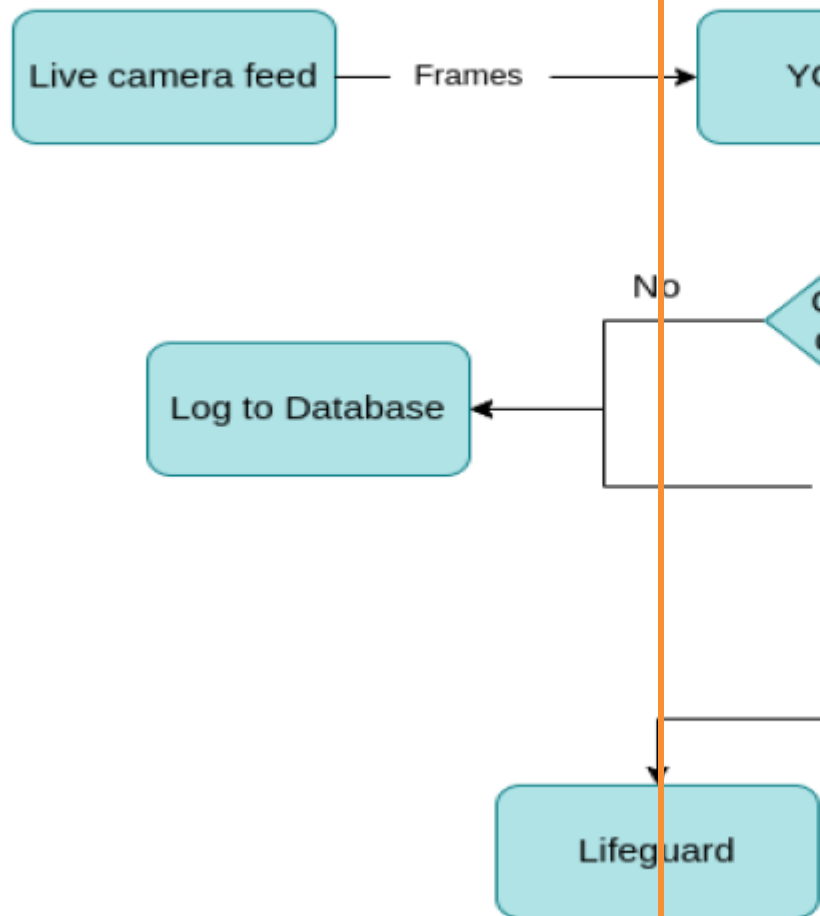
5.2 Solution & Technical Architecture
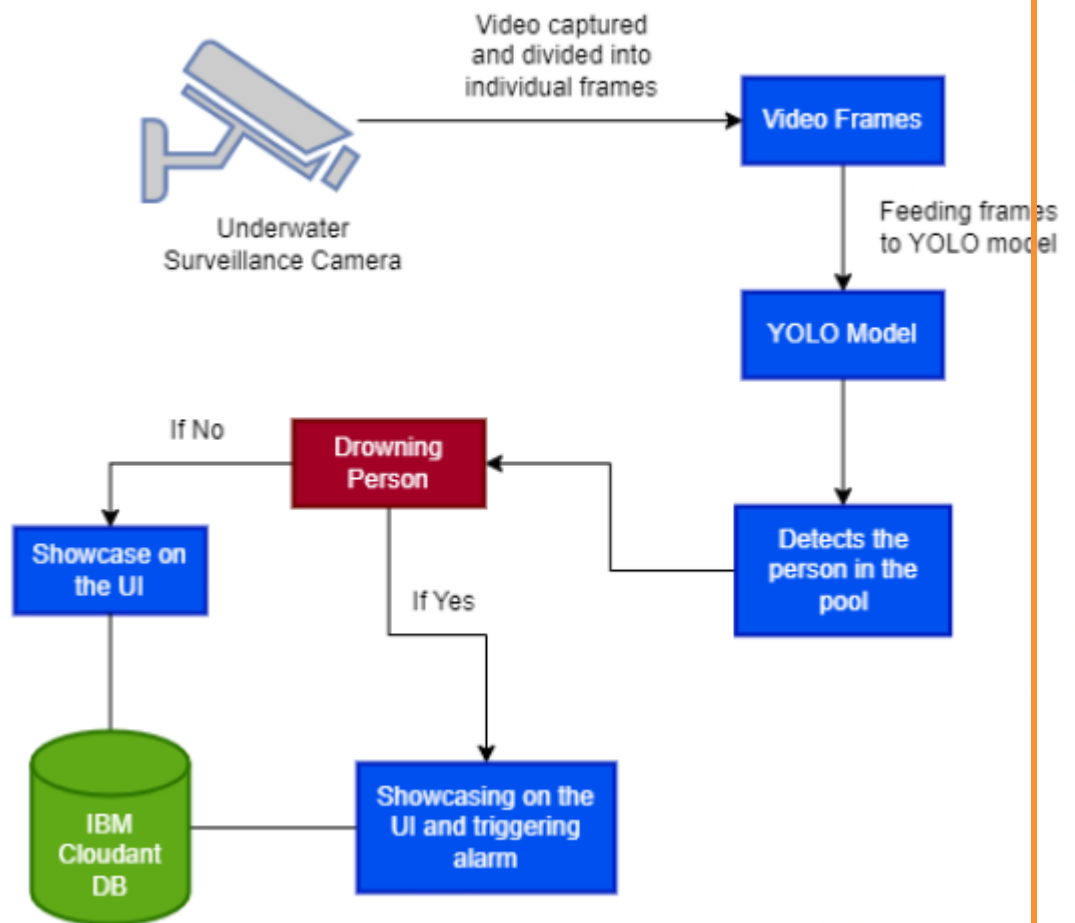
5.3 User Stories

User Stories

User Type	Functional Requirement (Epic)	User Story Number	User Story / Task
Customer (Pool owner)	Installation	USN-1	As a pool owner, I can install the set up the drowning detection
	Detecting the drowning persons	USN-2	As a user, I can find the dro using the drowning detectic
	Notify the lifeguard	USN-3	As a user, I can notify the l system detects a drowning
Customer (Lifeguard)	Rescue people	USN-4	As a user, I can rescue the from the pool
Customer (Swimmers)	Safety	USN-5	As a user, I can swim witho drowning
Customer Care Executive	Contact	USN-6	resolve technical issues
Administsrator	Dashboard	USN-7	Management of the drowni system and database man

6. PROJECT PLANNING & SCHEDULING

6.1 Sprint Planning & Estimation

Project Tracker, Velocity & Burndown Chart: (4 Marks)

Sprint	Total Story Points	Duration	Sprint Start Date
Sprint-1	8	6 Days	24 Oct 2022
Sprint-2	18	6 Days	31 Oct 2022
Sprint-3	4	6 Days	07 Nov 2022
Sprint-4	17	6 Days	14 Nov 2022

Velocity:

Imagine we have a 10-day sprint duration, and the velocity of the team i
per iteration unit (story points per day)

$$AV = \frac{sprint\ a}{velo}$$

For Sprint-1 the Average Velocity (AV) is

For Sprint-2 the Average Velocity (AV) is

For Sprint-3 the Average Velocity (AV) is: AV = Sprint D

For Sprint-4 the Average Velocity (AV) is: AV = Sprint Du

Burndown Chart:
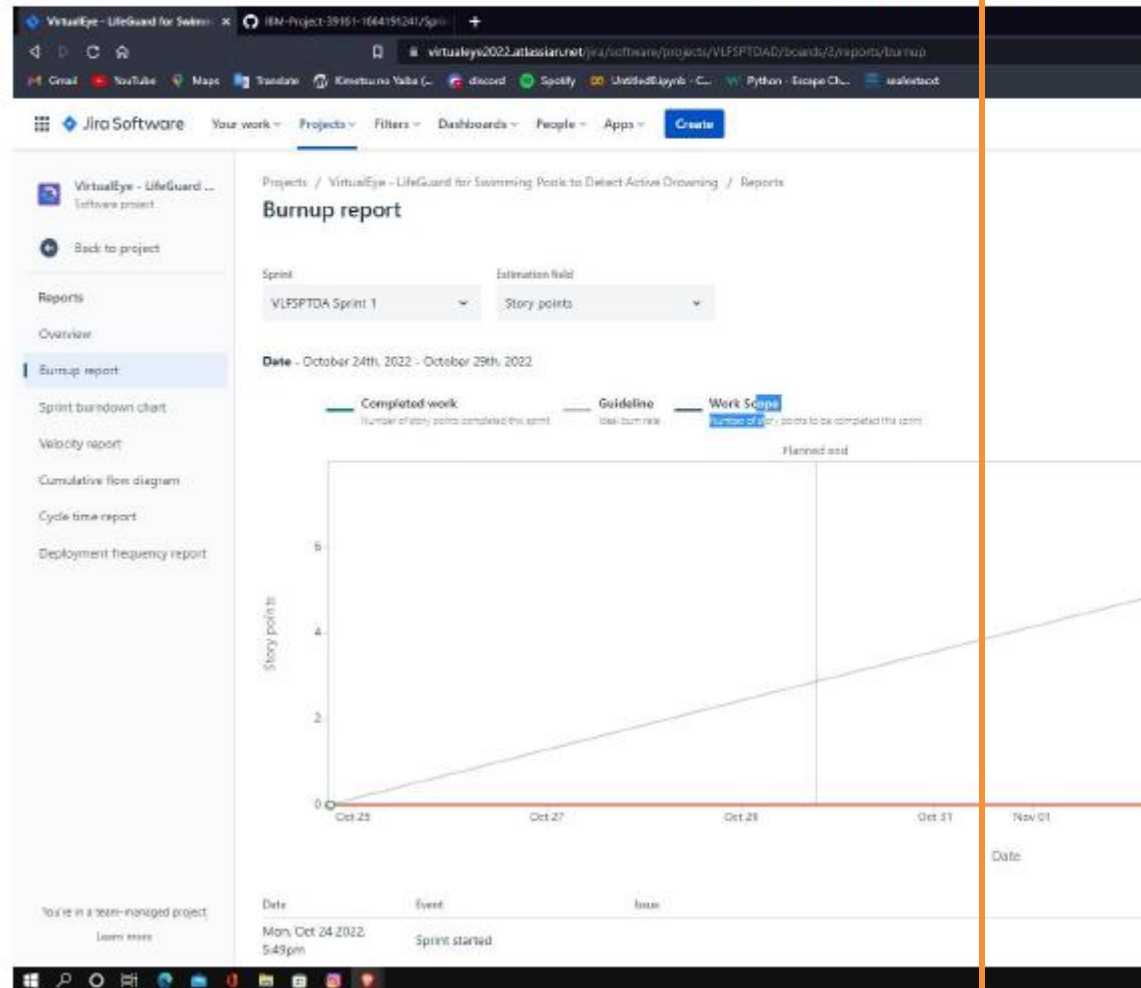
6.2 Sprint Delivery Schedule

Product Backlog, Sprint Schedule, and Estimation (4 Marks)

Use the below template to create product backlog and sprint schedule

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task
Sprint-1	Collect Testset	USN-1	Collect Testset
Sprint-1	Preprocess test set	USN-2	extract features from the Testset by preprocessing
Sprint-1	fine-tune the model	USN-3	fine-tune the model
Sprint-2	Detection	USN-4	Load the fine-tuned model.
Sprint-2	Detection	USN-5	Identify the person by collecting real-time data through a webcam.
Sprint-2	Detection	USN-6	Classifies it using a trained model to predict the output
Sprint-3	Registration	USN-7	As a user, I can register for the application by entering my email, and password, and confirming my password.
Sprint-3	Registration	USN-8	As a user, I will receive a confirmation em once I have registered for the application
Sprint-3	Login	USN-9	As a user, I can log into the application by entering email & password

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task
Sprint-4	Detection	USN-10	If a person is drowning, the system will r alarm to give signal
Sprint-4	Detection	USN-11	As a User, I can detect the drowning per
Sprint-4	Logout	USN-12	As a User, I can log out of the applicatio

6.3 Reports from JIRA

virtualeye2022.atlassian.net/jira/software/projects/VLF PTDAD/boards/2

Jira Software   Your work ⌄   Projects ⌄   Filters ⌄   Dashboards ⌄   People ⌄   Apps ⌄   **Create**

VirtualEye - LifeGuard ...
Software project

PLANNING

- Roadmap
- Backlog
- Board
- Reports

DEVELOPMENT

- Code

- Project pages
- Add shortcut
- Project settings

You're in a team-managed project
Learn more

Projects / VirtualEye - LifeGuard for Swimming Pools to Detect Active Drowning

VLFSPTDA Sprint 1

ML   Epic ⌄

TO DO	IN PROGRESS 2 ISSUES	DONE 1 IS
	extract features from the Testset by preprocessing ⋯	Collect T
	VLFSPTDAD-21	VLFS
	fine-tune the model	
	VLFSPTDAD-22	

7. CODING & SOLUTIONING (Explain the features added in the project along with code)

Base.html

<html lang="en">

<head>

```html
<meta charset="UTF-8">
<meta name="viewport" content="width=device-width, initial- scale=1.0">
<meta http-equiv="X-UA-Compatible" content="ie=edge">
<title>High Quality Facial Recognition</title>
<link href="https://cdn.bootcss.com/bootstrap/4.0.0/css/bootstrap.min.css" rel="stylesheet">
<script src="https://cdn.bootcss.com/popper.js/1.12.9/umd/popper.min.js"></script>
<script src="https://cdn.bootcss.com/jquery/3.3.1/jquery.min.js"></script >
<script src="https://cdn.bootcss.com/bootstrap/4.0.0/js/bootstrap.min.js"></script>
<link href="{{ url_for('static', filename='css/main.css') }}" rel="stylesheet">
<style>
.bg-dark { background-colour: #42678c!important;
}
#result { colour: #0a1c4ed1;
}
</style>
</head>
<body style="background-colour:black";>
<header id="head" class="header">
<section id="navbar">
<h1 class="nav-heading"></i>Virtual Eye</h1>
<div class="nav--items">
<up>
<li><a href="{{ url_for('index')}}">Home</a></li>
<li><a
href="{{ url_for('logout')}}">Logout</a></li>
<!-- <li><a href="#about">About</a></li>
<li><a href="#services">Services</a></li> -->
</ul>
</div>
</section>
</header>
<div class="container">
<div id="content" style="margin-top:2em">
<div class="container">
<div class="row">
```

```html
<div class="col-sm-6 bad" >
<h2><em style="color:white;">High Quality
Facial Recognition</em></h2>
<be>
<p><h5><i style="color:white;">Emotion
Detection Through Facial Feature Recognition</i></h5></p>
<image src="https://130e178e8f8ba617604b-
8aedd782b7d22cfe0d1146da69a52436.ssl.cf1.rackcdn.com/facial- recognition-
use-triggers-GDP-fine-showcase_image-10-a- 12991.jpg"
style="height:240px"class="img-rounded" alt="Gesture">
</div>
<div class="col-sm-6">
<div>
<h4 style="color:white;">Upload Image Here</h4>
<form action = "http://localhost:5000/"
id="upload-file" method="post" enctype="multipart/form-data">
<label for="imageUpload" class="upload-
label">
Choose Image
</label>
<input type="file" name="image"
id="imageUpload" accept=".png, .jpg, .jpeg,.pdf">
</form>
<div class="image-section" style="display:none;">
<div class="img-preview">
<div id="imagePreview">
</div>
</div>
<div>
<button type="button" class="btn btn-
info ban-lg " id="btn-predict">Analyse</button>
</div>
</div>
<div class="loader" style="display:none;"></div>
<h3>
<span id="result"> </span>
</h3>
</div>
```

```html
</div>

</div>

</div>

</div>

</div>

</body>

<footer>

<script src="{{ url_for('static', filename='js/main.js') }}"
type="text/javascript"></script>

</footer>

</html>
```

Index.html

```html
<!DOCTYPE html>

<html lang="en">

<head>

<meta charset="UTF-8">

<meta http-equiv="X-UA-Compatible" content="IE=edge">

<meta name="viewport" content="width=device-width, initial- scale=1.0">

<!--Bootstrap -->

<link rel="stylesheet"
href="https://maxcdn.bootstrapcdn.com/bootstrap/4.0.0/css/boo tstrap.min.css"
integrity="sha384-
Gn5384xqQ1aoWXA+058RXPxPg6fy4IWvTNh0E263XmFcJlSAwiGg

FAW/dAiS6JXm" crossorigin="anonymous">

<script src="https://code.jquery.com/jquery-3.2.1.slim.min.js"
integrity="sha384-
KJ3o2DKtIkvYIK3UENzmM7KCkRr/rE9/Qpg6aAZGJwFDMVNA/GpG

FF93hXpG5KkN" crossorigin="anonymous"></script>

<script src="https://cdnjs.cloudflare.com/ajax/libs/popper.js/1.12.9/umd/
popper.min.js" integrity="sha384-
ApNbgh9B+Y1QKtv3Rn7W3mgPxhU9K/ScQsAP7hUibX39j7fakFPsk

vXusvfa0b4Q" crossorigin="anonymous"></script>

<script src="https://maxcdn.bootstrapcdn.com/bootstrap/4.0.0/js/bootst
rap.min.js" integrity="sha384-
JZR6Spejh4U02d8jOt6vLEHfe/JQGiRRSQQxSfFWpi1MquVdAyjUar5

+76PVCmYl" crossorigin="anonymous"></script>

<script src="https://kit.fontawesome.com/8b9cdc2059.js"
crossorigin="anonymous"></script>

<link href="https://fonts.googleapis.com/css2?family=Akronim&family=
```

```html
Roboto&display=swap" rel="stylesheet">
<link rel="stylesheet" href="../static/style.css">
<!-- <script defer src="../static/js/main.js"></script> --> <title>Virtual
Eye</title>
</head>
<body>
<header id="head" class="header">
<section id="navbar">
<h1 class="nav-heading"></i>Virtual Eye</h1>
<div class="nav--items">
<up>
<li><a
href="{{ url_for('index')}}">Home</a></li>
<li><a
href="{{ url_for('login')}}">Login</a></li>
<li><a
href="{{ url_for('register')}}">Register</a></li>
<li><a href="{{ url_for('login')}}">Demo</a></li> </ul>
</div>
</section>
<section id="slider">
<div id="carouselExampleIndicators" class="carousel" data- ride="carousel">
<oil class="carousel-indicators ">
<li data-target="#carouselExampleIndicators" data-slide- to="0" class="active
"></li>
<li data-target="#carouselExampleIndicators" data-slide- to="1"></li>
<li data-target="#carouselExampleIndicators" data-slide- to="2"></li>
</ol>
<div class="carousel-inner">
<div class="carousel-item active">
<img class="d-block w-100" src="../static/img/1.png" alt="First slide">
</div>
<div class="carousel-item">
<img class="d-block w-100" src="../static/img/second.jpg" alt="Second slide">
</div>
<div class="carousel-item">
<img class="d-block w-100" src="../static/img/third.jpg" alt="Third slide">
</div>
```

```html
</div>

<a class="carousel-control-prev" href="#carouselExampleIndicators"
role="button" data- slide="prev">

<span class="carousel-control-prev-icon" aria- hidden="true"></span>

<span class="sr-only">Previous</span>

</a>

<a class="carousel-control-next" href="#carouselExampleIndicators"
role="button" data- slide="next">

<span class="carousel-control-next-icon" aria- hidden="true"></span>

<span class="sr-only">Next</span>

</a>

</div>

</section>

</header>

<section id="about">

<div class="top">

<h3 class="title text-muted">

ABOUT PROJECT </h3>

<div class="line"></div>

</div>

<div class="body">

<div class="left">

<h2>Problem:</h2>

<p>
```

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.

```html
</p>

</div>

<div class="left">

<h2>Solution:</h2>

<p>
```

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 . 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.

\</p\>

\</div\>

\</div\>

\<div class="bottom"\>

\<p \>\<b\>

Note : The system is not designed to replace a lifeguard or other human monitor, but to act as an additional tool. â€oeIt helps the lifeguard to detect the underwater situation where they canâ€™t easily observe.

\</b\>\</p\>

\</div\>

\</section\>

\<section id="footer"\>

\<p\>Copyright Â© 2022. All Rights Reserved\</p\>

\<div class="social"\>

\<a href="#" target="_blank"\>\<i class="fab fa-2x fa-twitter- square"\>\</i\>\</a\>

\<a href="#" target="_blank"\>

\<i class="fab fa-2x fa-linkedin"\>\</i\>\</a\>

\<a href="#"\>

\<i class="#"\>\</i\>

\</a\>

\</div\>

\</section\>

\</body\>

\</html\>

Logout.html

\<!DOCTYPE html\>

\<html \>

\<head\>

\<meta charset="UTF-8"\>

\<meta name="viewport" content="width=device-width, initial- scale=1"\>

\<title\>Virtual Eye\</title\>

\<link href='https://fonts.googleapis.com/css?family=Pacifico' rel='stylesheet' type='text/css'\>

```html
<link href='https://fonts.googleapis.com/css?family=Arimo' rel='stylesheet' type='text/css'>

<link href='https://fonts.googleapis.com/css?family=Hind:300' rel='stylesheet' type='text/css'>

<link href='https://fonts.googleapis.com/css?family=Open+Sans+Conde nsed:300' rel='stylesheet' type='text/css'>

<link href='https://fonts.googleapis.com/css?family=Merriweather' rel='stylesheet'>

<link href='https://fonts.googleapis.com/css?family=Josefin Sans' rel='stylesheet'>

<link href='https://fonts.googleapis.com/css?family=Montserrat' rel='stylesheet'>

<style>

.header { top:0; margin:0px;

left: 0px; right: 0px; position: fixed; background-color:

#28272c; color: white; box-shadow: 0px 8px 4px grey; overflow: hidden;
padding-left:20px; font-family: 'Josefin Sans'; font-size: 2vw; width: 100%;
height:8%;

text-align: center;

}

.topnav { overflow: hidden; background-color: #333;

}

.topnav-right a { float: left; color: #f2f2f2; text-align: center; padding: 14px
16px; text-decoration: none; font-size: 18px;

}

.topnav-right a:hover { background-color: #ddd; color: black;

}

.topnav-right a.active { background-color: #565961;

color: white;

}

.topnav-right { float: right; padding-right:100px;

}

.login{

margin-top:-70px;

}

body {

background-color:#ffffff; background-repeat: no-repeat; background-
size:cover; background-position: 0px 0px;

}
```

```css
.main{ margin-top:100px; text-align:center;
}
form { margin-left:400px;margin-right:400px;}
input[type=text],
input[type=email],input[type=number],input[type=password] { width: 100%;
padding: 12px 20px; display: inline-block; margin-bottom:18px; border: 1px
solid #ccc; box-sizing: border-box;
}
button {
background-color: #28272c; color: white; padding: 14px 20px; margin-
bottom:8px; border: none; cursor: pointer; width: 20%;
}
button:hover {
opacity: 0.8;
}
.cancelbtn { width: auto; padding: 10px 18px; background-color: #f44336;
}
.imgcontainer {
text-align: center;
margin: 24px 0 12px 0;
}
img.avatar {
width: 30%;
border-radius: 50%;
}
.container { padding: 16px;
}
span.psw {
float: right;
padding-top: 16px;
}
/* Change styles for span and cancel button on extra small screens */
@media screen and (max-width: 300px) { span.psw {
display: block;
float: none;
}
.cancelbtn { width: 100%;
}
```

```html
}
</style>
</head>
<body style="font-family:Montserrat;">
<div class="header">
<div style="width:50%;float:left;font-size:2vw;text- align:left;color:white;
padding-top:1%">Virtual eye</div>
<div class="topnav-right" style="padding-top:0.5%;">
<a href="{{ url_for('home')}}">Home</a>
<a href="{{ url_for('login')}}">Login</a>
<a href="{{ url_for('register')}}">Register</a> </div>
</div>
<div class="main">
<h1>Successfully Logged Out!</h1>
<h3 style="color:#4CAF50">Login for more information<h3>
<a href="{{ url_for('login') }}"><button type="submit">Login</button></a>
</form>
</div>
</body>
</html>
```

Prediction.html

```html
<!DOCTYPE html>
<html lang="en">
<head>
<meta charset="UTF-8">
<meta http-equiv="X-UA-Compatible" content="IE=edge">
<meta name="viewport" content="width=device-width, initial- scale=1.0">
<!--Bootstrap -->
<link rel="stylesheet"
href="https://maxcdn.bootstrapcdn.com/bootstrap/4.0.0/css/boo tstrap.min.css"
integrity="sha384-

Gn5384xqQ1aoWXA+058RXPxPg6fy4IWvTNh0E263XmFcJlSAwiGg

FAW/dAiS6JXm" crossorigin="anonymous">
<script src="https://code.jquery.com/jquery-3.2.1.slim.min.js"
integrity="sha384-
KJ3o2DKtIkvYIK3UENzmM7KCkRr/rE9/Qpg6aAZGJwFDMVNA/GpG

FF93hXpG5KkN" crossorigin="anonymous"></script>
<script src="https://cdnjs.cloudflare.com/ajax/libs/popper.js/1.12.9/umd/
popper.min.js" integrity="sha384-
```

```
ApNbgh9B+Y1QKtv3Rn7W3mgPxhU9K/ScQsAP7hUibX39j7fakFPsk
vXusvfa0b4Q" crossorigin="anonymous"></script>
<script src="https://maxcdn.bootstrapcdn.com/bootstrap/4.0.0/js/bootst
rap.min.js" integrity="sha384-
JZR6Spejh4U02d8jOt6vLEHfe/JQGiRRSQQxSfFWpi1MquVdAyjUar5
+76PVCmYl" crossorigin="anonymous"></script>
<script src="https://kit.fontawesome.com/8b9cdc2059.js"
crossorigin="anonymous"></script>
<link href="https://fonts.googleapis.com/css2?family=Akronim&family=
Roboto&display=swap" rel="stylesheet">
<link rel="stylesheet" href="../static/style.css">
<script defer src="../static/js/JScript.js"></script>
<title>Prediction</title>
</head>
<body>
<header id="head" class="header">
<section id="navbar">
<h1 class="nav-heading"></i>Virtual Eye</h1>
<div class="nav--items">
<ul>
<li><a href="{{ url_for('index')}}">Home</a></li>
<li><a
href="{{ url_for('logout')}}">Logout</a></li>
<!-- <li><a href="#about">About</a></li>
<li><a href="#services">Services</a></li> -->
</ul>
</div>
</section>
</header>
<!-- dataset/Training/metal/metal326.jpg -->
</br>
<section id="prediction">
<h2 class="title text-muted">Virtual Eye- Life Guard for
Swimming Pools to Detect Active Drowning</h1>
<div class="line" style="width: 900px;"></div>
</section>
</br>
<section id="about">
```

```html
<div class="body">
<div class="left">
<p>
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.
</p>
</div>
<div class="left">
<div class="prediction-input">
<img class="d-block w-100" src="../static/img/second.jpg" alt="Second slide">
</br>
<form id="form" action="/result" method="post" enctype="multipart/form-data">
<input type="submit" class="submitbtn" value="Click
Me! For a Demo">
</form>
</div>
<h5 style="text-color:Red">
<b style="text-color:Red">{{prediction}}<b>
</h5>
</div>
</div>
</section>
</br></br>
<section id="footer">
<p>Copyright © 2021. All Rights Reserved</p>
</section>
</body>
</html>
```

8. TESTING

8.1 Test Cases
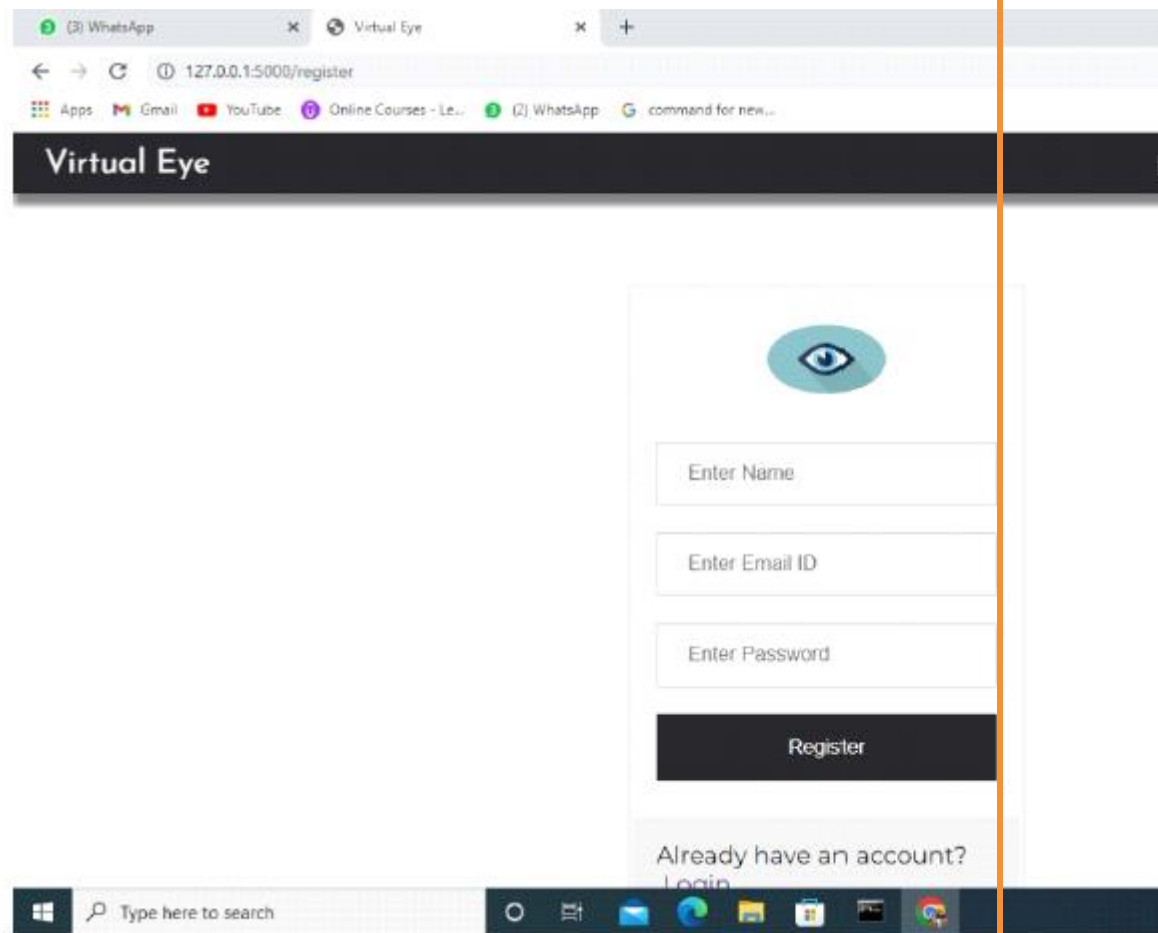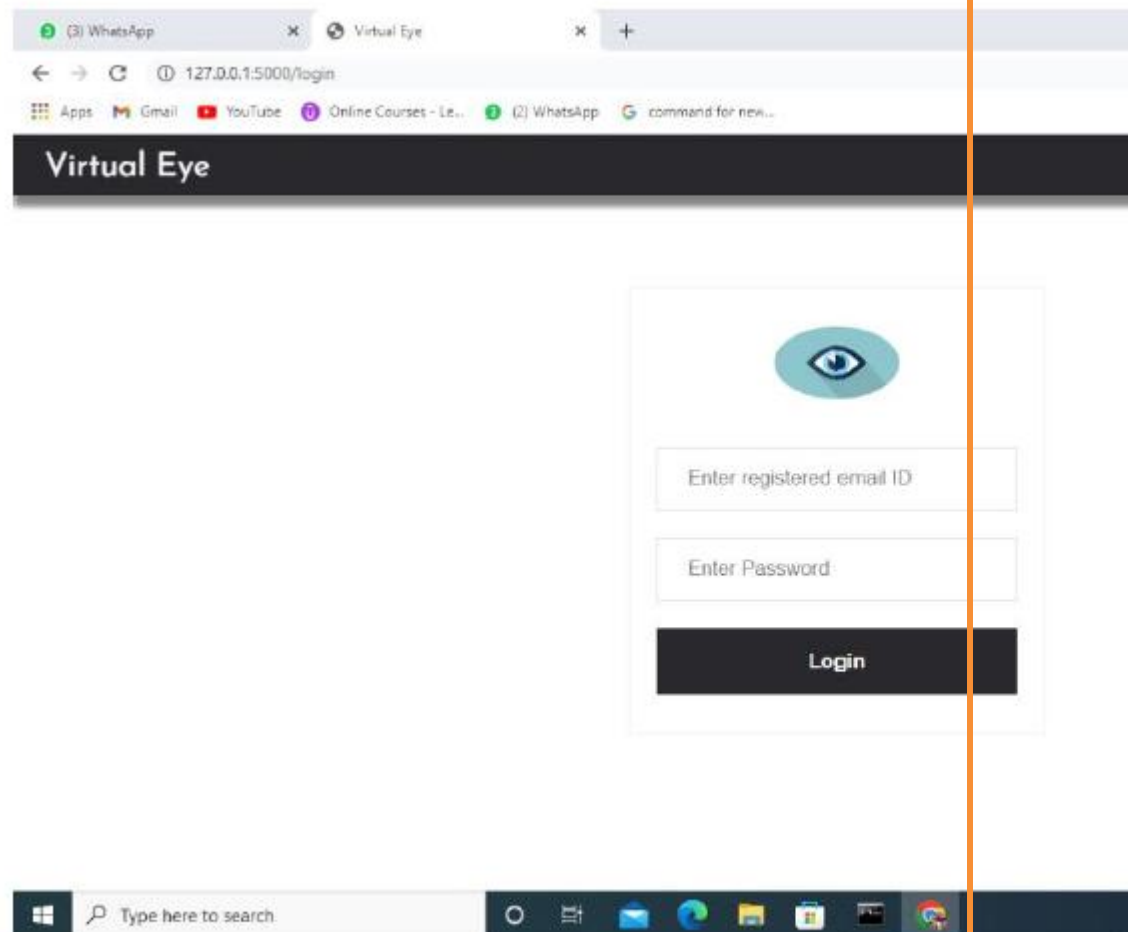
8.2 User Acceptance Testing

1. Defect Analysis

This report shows the number of resolved or closed bugs at each sever[ity] they were resolved

Section	Total Cases	Not Tested
Print Engine	2	0
Client Application	2	0
Security	1	0
Outsource Shipping	1	0
Exception Reporting	2	0
Final Report Output	1	0

2. Test Case Analysis

Resolution	Severity 1	Severity 2	Severity 3	Severity 4
By Design	10	4	2	3
Duplicate	1	0	3	0
External	2	3	0	1
Fixed	11	2	4	20
Not Reproduced	0	0	1	0
Skipped	0	0	1	1
Won't Fix	0	5	2	1
Totals	24	14	13	26

This report shows the number of test cases that have passed, failed, an[d]

Version Control	1	0

9. RESULTS

9.1 Performance Metrics

Model Performance Testing:

Project team shall fill the following information in model perform

S.No.	Parameter	Values
1.	Model Summary	-
2.	Accuracy	Training Accuracy - 28 Validation Accuracy -44

10.ADVANTAGES & DISADVANTAGES

Using AI alongside other technologies we can make machines take decisions faster than a human and carry out actions quicker.

...

High Costs of Creation: ...

Making Humans Lazy: ...

Unemployment: ...

No Emotions: ...

Lacking Out of Box Thinking:

Disadvantages:

'Every aspect of learning or any other feature of intelligence can in principle be so precisely described that a machine can be made to simulate it.

An attempt will be made to find how to make machines use language, form abstractions, and concepts, solve kinds of problems now reserved for

humans, and improve themselves.'Artificial Intelligence is the ability of a computer program to learn and think. Everything can be considered

Artificial intelligence if it involves a program doing something that we would normally think would rely on the intelligence of a human.

11. CONCLUSION

This literature review has discussed the various complexities of DDS within the health and safety landscape, as well as the wider implications of their

use on the sport and leisure industry. It has also shed light on needed for more evidence in this area. From reviewing what literature currently exists

on the topic, it is clear the evidence-base would benefit from qualitative research on the experiences of lifeguards and their interactions with DDS, as

well as quantitative evidence showing DDS application to real-world scenarios. Claims expressing the risks of DDS negatively affecting lifeguarding

performance should also be further investigated, and efforts made across the industry to ensure all publicly available information and guidance

surrounding DDS is current and up-to-date. The Drowning Detection System Briefing note (Sport England, 2011) was published before documents

such as HSG179 (4th edition), which is periodically updated, and ISO_20380 – operators should ensure that the sources they are using for DDS

research do not draw from predated editions of health and safety law and guidance. Again, co-operation is required between all with an interest in

the improvement of pool safety, to share data, information and learning on DDS, including but not restricted to results and findings from any DDS

standards tests carried out. For by building and maintaining a robust evidence-base in this area, policy makers, operators, and suppliers can feel

confident in their decision-making around the improvement of safety in public swimming pools.

12. FUTURE SCOPE

AI in Science and Research. AI is making lots of progress in the scientific sector. ...

AI in Cyber Security. Cybersecurity is another field that's benefitting from AI. ...

AI in Data Analysis. Data analysis can benefit largely from AI and ML. ...

AI in Transport.

13.APPENDIX

Source Code

```python
    indices = cv2.dnn.NMSBoxes(boxes, confidences, confidence, nms_thresh)

    bbox = [] label
    = [] conf = []
for i in indices: i = i[0] box = boxes[i] x = box[0] y = box[1]
    w = box[2] h = box[3] bbox.append([round(x), round(y),
    round(x+w), round(y+h)])
    label.append(str(classes[class ids[i]]))
    conf.append(confidences[i])
return bbox, label, conf
```

Utils.py

```python
import requests import progressbar as pb import os def
download_file(url, file_name, dest_dir):
    if not os.path.exists(dest_dir):
        os.makedirs(dest_dir) full_path_to_file = dest_dir +

    os.path.sep + file_name

    if os.path.exists(dest_dir + os.path.sep + file_name): return

    full_path_to_file print("Downloading " + file_name + " from " +

    url)

    try: r = requests.get(url, allow_redirects=True, stream=True)
    except:
        print("Could not establish connection. Download failed") return None
file_size = int(r.headers['Content-Length']) chunk_size =
    1024
    num_bars  =  round(file_size  /  chunk_size)  bar  =

    pb.ProgressBar(maxval=num_bars).start()

    if r.status code != requests.codes.ok:
        print("Error occurred while downloading file") return None
```

```python
@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) 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:
```

```python
        #there is still need to tweek the threshold
        #this threshold is for checking how much the centre has mo

        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 ,'confidenc
conf[0], 'centre: ', centre)
        #print(bbox,label ,conf, centre)
        print('bbox: ', bbox, 'centre:', centre, 'centre0:', cen
        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="Emerg
!!! 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)
```
Detect.py:

```python
            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 does
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])
```

DEMO LINK:

GITHUB LINK:

https://github.com/IBM-EPBL/IBM-Project-3087-1658500512