

VISION ON WAY



BS (SE) Final Year Project Report

Submitted by

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December 2022

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DEPARTMENT OF COMPUTER SCIENCE AND SOFTWARE ENGINEERING
JINNAH UNIVERSITY FOR WOMEN
PROJECT APPROVAL

Project Title: Vision onWay

By

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ABSTRACT

In a world full of fitness freaks, it is extremely difficult for blind people to maintain their physical fitness as they cannot walk on jogging tracks or exercise independently. Several barriers often prevent people with impaired vision from engaging in physical activities. They have a fear of getting lost or failing. Vision onWay is a platform that will provide them all with one health tool to ensure the physical fitness that motivates them to be fit. It is a flutter-based mobile application that helps visually impaired people to keep themselves on a walking track while exercising and walking. It detects paths using image processing and sends a voice alert if they are getting off track or find any kind of obstacle in their following path. We used CNN Algorithm, a deep-learning technique for path and obstacle detection. Our application has audio-described workout videos. They can follow those videos and burn calories according to the number of sets done. The application displays the current result after every walk and exercise, and weekly progress at the end of the week. Vision onWay ensures the fitness of blind people and aims to promote a defensible and safe environment for them when they walk and exercise.

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ACKNOWLEDGEMENT

We would like to express our sincere gratitude to several individuals and our university for supporting us throughout our Final Year Project. First, we wish to express our acknowledgment to our supervisor, Lecturer Ms. Tehreem Qamar, for her enthusiasm, patience, insightful comments, helpful information, practical advice and unceasing ideas that have helped us tremendously at all times in our Project. Her immense knowledge, profound experience and professional expertise has enabled us to complete this project successfully. Without her support and guidance, this project would not have been possible. We could not have imagined having a better supervisor than her in our project. We want to send our special thanks to our external Advisor Mr. Mirza Daniyal Masood who support us with his valuable skills. We also wish to express our sincere thanks to FYP committee for accepting our idea and give us the chance to prove ourselves. In addition, we are deeply indebted to our Head of Department, Prof. Dr. Narmeen Zakaria Bawany. She always inspires us and motivates us to do better. We would like to pay thanks to the whole department each and every individual. Your support has enabled us to complete our project successfully.

CHAPTER 1

INTRODUCTION

In this chapter, you have saw overview of our project, the purpose of being made, stakeholders connected with Vision onWay, benefits and the background study related to fitness application for blind people.

1.1 OVERVIEW

Physical activity or exercise can improve your health and reduce the risk of developing several diseases like type 2 diabetes, cancer and cardiovascular disease but it's harder for visually impaired people to walk and exercise freely in parks and jogging tracks on their own. There are several barriers that often prevent people with impaired vision from engaging in physical activities. They include: Lack of motivation, energy, and fear of getting hurt, Lack of information to helpful resources, trouble learning new physical activities, that's where our idea comes in Vision onWay. It is a mobile application that helps visually impaired people to keep them on track while exercising and walking. It will detect path using image processing and send a voice alert if they are getting off track or find any kind of obstacle in their following path. We will use (CNN Algorithm) a deep learning technique for path and obstacle detection. Our application have audio described workout videos. They will follow those videos and burn calories according to no of sets done. It will contain fitness features like BMI Calculator, calories burned count, etc. Application will display current result after every walk and exercise, and weekly progress at the end of the week.

1.2 PURPOSE

Vision onWay ensures a safe and healthy lifestyle for visually impaired individuals. Our application will be very simple and accessible for blind people. Our motive is to promote healthy walk for blind people on park's track. Audio described workout videos helps them to be fit and healthy by instructing them throughout the workout session. Daily and weekly progress will help them to track their fitness status and

motivate them to be fit. Vision onWay allows them to go in parks and feel the fresh air and do healthy walks in park's track without getting hurt or any fear of loss and distraction.

1.3 STAKEHOLDERS

Our project's stakeholder is our users. We have two types of users. One is blind that will use all features including path detection and obstacle detection feature for safe walk and second user is fitness freak who will use all features related to fitness except path detection and obstacle detection.

1.4 BENEFITS

Vision Impairment causes fitness issues. Blind people can't get enough benefit from fitness centers and fitness applications. Vision onWay helps blind people to track their fitness scale and help them being fit and healthy by tracking their path during walking on park's track and generate voice alert in the case of distraction and any kind of barrier. Audio Described workout videos instruct them during their workout. Vision onWay tracks their fitness status at daily and weekly basis.

1.5 BACKGROUND STUDY

As of today, more than 250 million people all over the world live with visual impairment[1]. Although visual disability affects all segments of the population, it is particularly prevalent in seniors; a majority of the total blind population across the globe is aged 50 or older According to many researches studies physical exercise is very difficult for blind people. Normal people are healthier than visually impaired people because physical activity or exercise can improve health and prevent many diseases but it's harder for blind people to walk and exercise daily due to several reasons[2][3]. According to reports gyms also available for blind people but sadly, however, they are often woefully inaccessible and can be daunting for those with sight loss[4]. There is a lot of physical exercise that institutes teach to blind people Especially for their physical fitness and for self-defense also[5]. Other than that many other exercises that blind can do but with someone's guide and instructions include Walking up/down stairs ,Squats ,Balance ,Walking ,Stretching etc[6]. Some places organize Racing Competition for blind people. One rope is connected with each individual, they hold rope with one hand and run so they do not distract from their path that also contribute to their physical fitness [7]. As well as

many mobile applications that are working for blind fitness like Promenade, Fitbit (gadget + app), Sunu Band (gadget), MyEye 2.0 (gadget), Seeing AI, BlindSquare etc[8]. Promenade[9] is a fitness app and band prototype built specifically for people with low vision and the visually impaired. The app is geared towards people who are inexperienced with exercise to have a hands-off workout experience[10]. Another fitness app Fitbit[11] has taken the world by storm by its wearable activity tracker device. It is wireless-enabled and provides beneficial fitness information such as the number of steps walked in a day etc. Sunu Band[12] is a small smart-band that uses radar and augmented reality to guide the wearer around obstacles. It uses echolocation to detect objects, obstacles or people up to 16 feet (5.5 meters) away. Another Fitness app MyEye 2.0[12] is a finger-sized camera that attaches to a pair of glasses and gives the wearer a kind of ‘robotic vision’ of their surroundings. Launched in 2017 by OrCam, it consists of a 12megapixel camera and a small speaker that identifies text, product labels, currency and even human faces, and then conveys that information to the user. Seeing AI[13] is a free app by Microsoft that basically narrates the world around the user. Designed for people with low vision or complete visual impairment, this app is extremely useful for identifying short pieces of text (it can also identify and read handwritten text), recognizing currency, scanning as well. Its algorithm determines the information that is most useful to you, like gyms, fitness centers, post offices, libraries, cafes and so on.

All apps are very helpful regarding fitness tracking in their own way but there is a lacking in a fact that those apps do not provide navigation when people want to exercise and walk in the jogging tracks. Deep learning is playing a very important role in the area that is covered blind ones. Using the deep learning approach that is the tensor flow object detection. Object can be detected and recognized using the API that detect multiple objects in real time videos stream using one of the Deep Learning technique called CNN[14].

1.5.1 CNN ALGORITHM

A Convolutional Neural Network (CNN)[15] is a Deep Learning algorithm which can take in an input image, assign importance (learnable weights and biases) to various aspects/objects in the image and be able to differentiate one from the other. (CNNs) have gained remarkable success on many images’ classification tasks in recent years. However, the performance of CNNs highly relies upon their architecture[16]. CNN Algorithm

showed immense growth in the field of blind fitness in the past few years. There is one of the applications of Object detection system for visual disable people based on CNN in real time has been proposed. The complexity of selective search in the Fast R-CNN has been reduced by using edge box in SSD. This leads to faster runtime and reduced time complexity without degrading the performance. The system has retrieved the trained model from the cloud database to perform object detection in real time. The proposed system is beneficial for the visual impaired people for better living quality. Another most important application of CNN is pedestrian lane detection[17]. This method achieves high accuracy by automatically optimizing the feature representation to the detection task and regularizing the neural network. After evaluating the proposed method on a difficult database containing pedestrians in a city environment with no restrictions on pose, action, background and lighting conditions, it is found that the false positive rate (FPR) of the proposed CNN classifier is less than 1/5th of the FPR. For Pedestrian Lane detection it is important to collect a dataset of around 2000 images. Evaluation results on a large data set have shown that the proposed method is able to detect various types of unstructured pedestrian lanes, in outdoor and indoor scenes under challenging environmental conditions. It also has higher accuracy compared to two other existing pedestrian lane detection methods[18].

We proposed an idea that is use for tracking fitness attributes of blind people but it will guide them if they are walking on jogging tracks, for this purpose we will use CNN algorithm, a deep learning technique.

CHAPTER 2

REQUIREMENTS

In this chapter we have discussed those requirements that was the reason behind the creation of our project. This chapter includes 2 types of requirements Functional and Non-Functional.

2.1 FUNCTIONAL REQUIREMENTS

First, we have discussed functional requirements of Vision onWay. These are product features or functions that we must implement to enable users to accomplish their tasks.

2.1.1 LOGIN

After splash screen there should be a signup screen to make an account of an app. User have to enter their name, email and password to create their account on Vision onWay. Those fields should accept only valid data. Invalid data must throw error. All information retrieve from signup page will directly move to database.

2.1.2 SIGNUP

For login, user must fill required fields present on login page. They have to enter email and password of Existing account created on Vision onWay. All data should be valid. Only registered account must allow to sign in.

2.1.3 PROFILE CREATION

After successfully account creation user will create their fitness profile having fields Age, Height, weight BMI etc. User will set their profile picture and update it.

2.1.4 BMI CALCULATOR

Application should have BMI calculator. After profile creation user will calculate his/her BMI by giving input their weight and height. Calculated BMI should display at the bottom of the BMI page and save on the database.

2.1.5 WALKING FEATURE

Application should have walking button in profile page. User should navigate to camera Screen after clicking on walking button. Camera will detect path and generate

voice alert if they are getting out of path and guide them to move right direction. Application will also generate voice alert if any kind of obstacle in the following path.

2.1.6 WORKOUT FEATURE

Application should have workout option in home page. Workout Page must have audio described workout videos associated with No. of sets and time with each video. Calories burned will count according to the No. of sets performed in a time interval. After Workout current result should display including exercise name, no of sets, calories burned, time date etc.

2.1.7 VIEW PROGRESS

Current result of workout shall display after every exercise. Progress will have to save in the progress card and weekly progress should display at the end of the week.

2.1.8 VOICE ALERT

Application should generate voice alert if user will distract from path and guide them where to move to be on right path again. Application will generate voice alert if application detect any kind of obstacle in following path.

2.1.9 BLUETOOTH CONNECTION

Application should connect with wireless earbuds and camera via Bluetooth.

2.2 NON-FUNCTIONAL REQUIREMENTS

In this section we have discussed nonfunctional requirements of Vision onWay. Those requirements define Vision onWay's attributes such as security, reliability, performance, maintainability, scalability, and usability.

2.2.1 PERFORMANCE

The application should detect the lane and hurdle within 10 sec. Steps should be counted with the least error. Distance and calories burnt should be calculated and displayed alongside.

2.2.2 DESIGN CONSTRAINT

The application should be able to run on any Android device having a minimum Android version. App will be use offline too.

2.2.3 AVAILABILITY

The application should be available at all times.

2.2.4 USABILITY

Ease of use and user-friendly interface that allow blind users to seamlessly interact with the product. The application should generate voice alert.

2.2.5 SECURITY

The system shall protect the data and services from unauthorized access. The system shall provide authentication.

CHAPTER 3

ANALYSIS AND DESIGN

In Chapter 3 we have seen our project with the design perspective. We have discussed all UML diagrams of Vision onWay and user interfaces that will include app and website interface.

3.1 SYSTEM ARCHITECTURE WITH DIAGRAM

Our System will work on MVC Architecture. Model View Controller Architecture. User will connect through view.dart. View.dart will pass message to model.dart through controller.dart. Model.dart bring data from database if necessary and pass to the view through controller.dart.

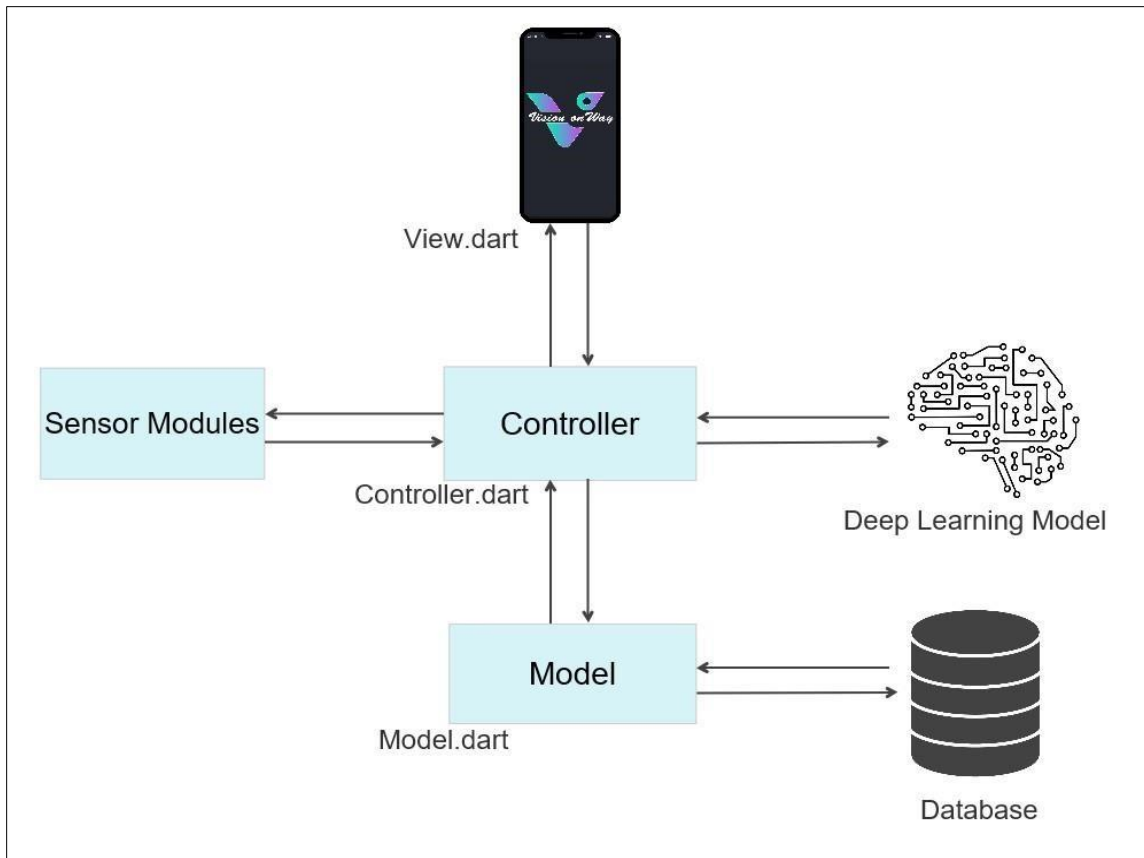


Figure 3.1 Architecture Diagram

3.2 ENTITY RELATIONSHIP DIAGRAM

Entity Relationship diagram explains the relationship of data in database. We have user entity for all details regarding user and then Exercise Entity stores the threshold value of workout, Tutorial entity contain Tutorials and all details regarding tutorial. In progress Entity runtime result will store.

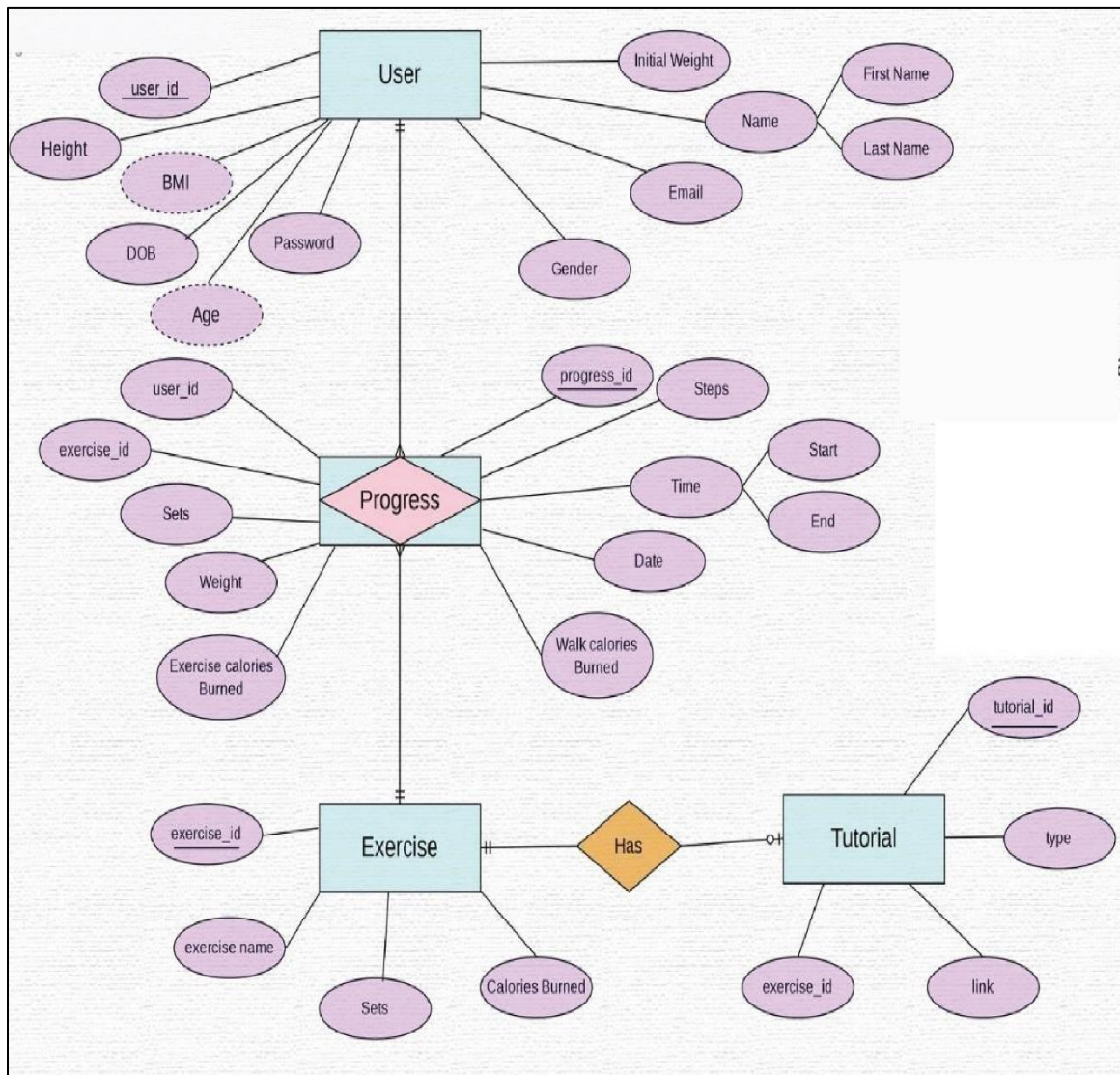


Figure 3.2 Entity Relationship Diagram

3.3 PROJECT FLOW DIAGRAM

In this Diagram we explain the complete flow of project. First user signup then login, create profile, calculate BMI, then perform walk and exercise and at the end view their progress and check their previous result.

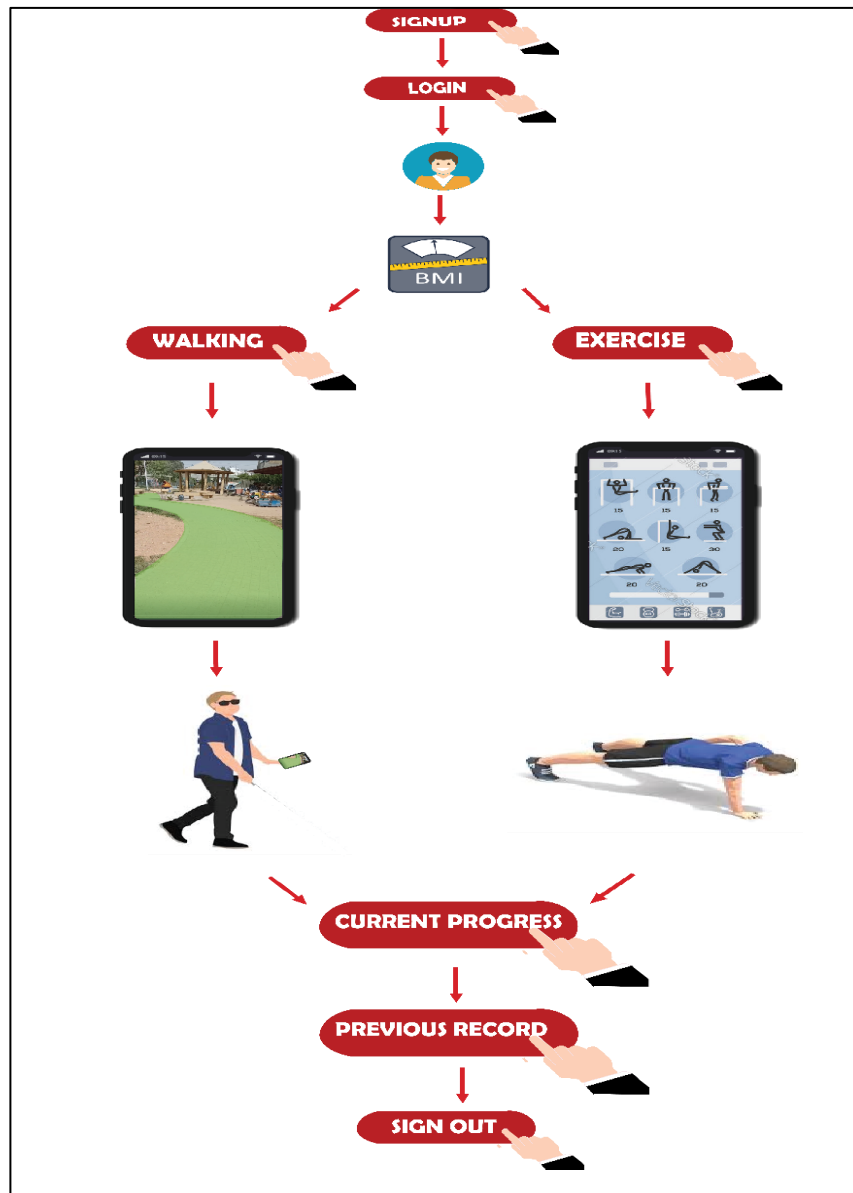


Figure 3.3 Project Flow Diagram

3.4 USE CASES

A use case diagram is a graphical depiction of user's possible interactions with the system. We have only one type of users who interact with our system. Firstly, user create an account for using Vision onWay then after signing in user have to create his profile, after than this user can check his profile which shows his calculated BMI. In Vision onWay we have two activities user can select only one activity at a time either walking or workout. After selecting walking a camera screen will open and it will start detecting user walking path and other hurdle on his way. If user select workout, then it will show workout tutorials. After performing activities user can get his current progress which shows his burned calories. User can also access his all-previous progress records.

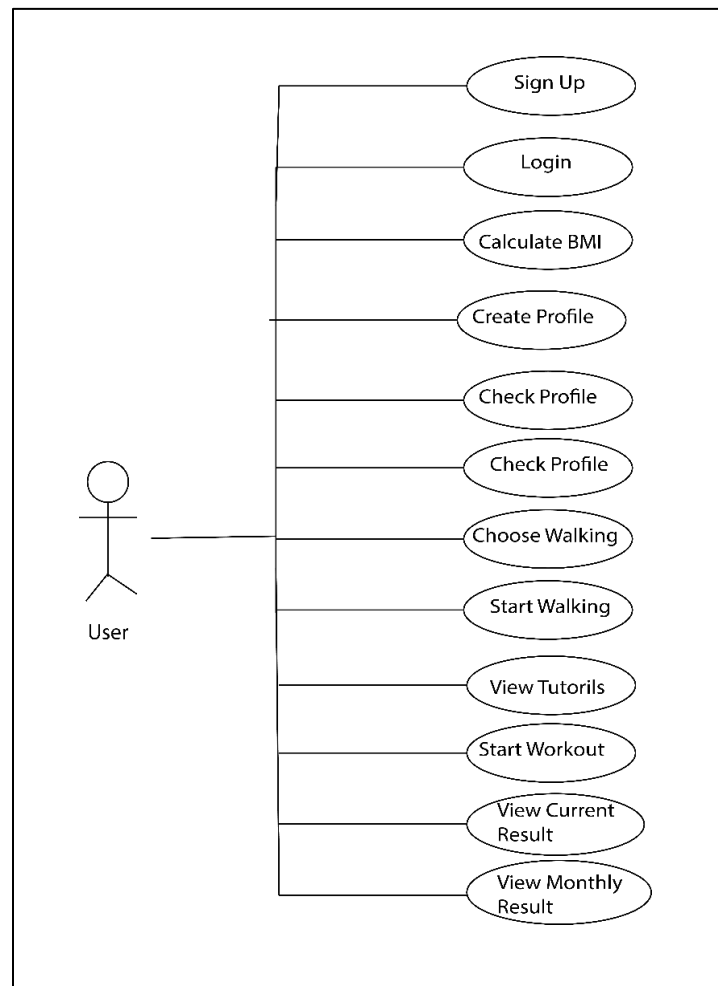


Figure 3.4 Use Case

3.5 ACTIVITY DIAGRAM

In activity diagram we can define the overall flow of application. In which we can create an account after login we create a profile then user set BMI like height age weight. After that we have homepage. homepage have a 2 features walking, workout Walking: if user want to walk then select walking and camera open to detect lane and object generate alert if out of lane or any hurdle found after that instant camera will be closed. Calculate distance time no of calories and step counts display in current record and save in previous record Workout: consist of a list of activities. Select activity (for instance select video and gifs) to perform activity .after all calculate calories and time and save in previous record.

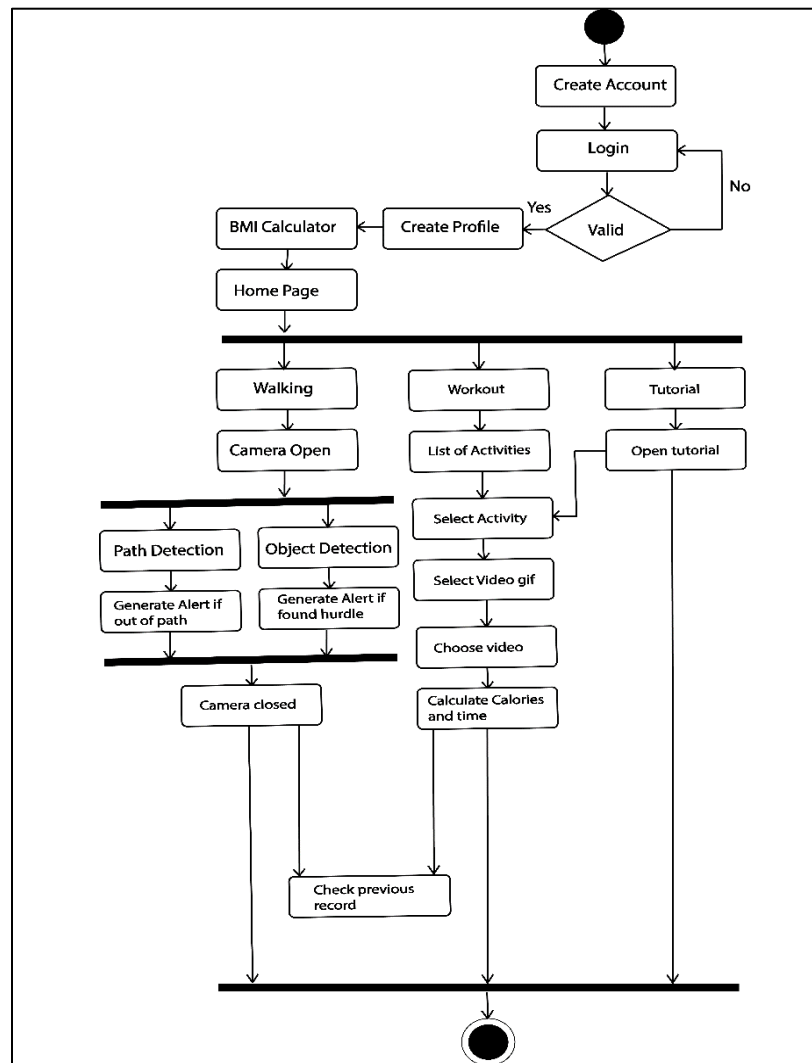


Figure 3.5 Activity Diagram

3.6 USER INTERFACE DESIGN

Figure 3.6 is the main screen of our application, user can navigate to BMI screen, Walking, workout, progress etc. User can maintain their profile by uploading profile picture. Figure 3.7 represents the BMI screen; user can check their BMI by entering age and height. There is separate options for male and female in BMI screen. Figure 3.8 depicts the full body workout schedule of one week. User can navigate to day1, day2 and so on by clicking on those buttons.

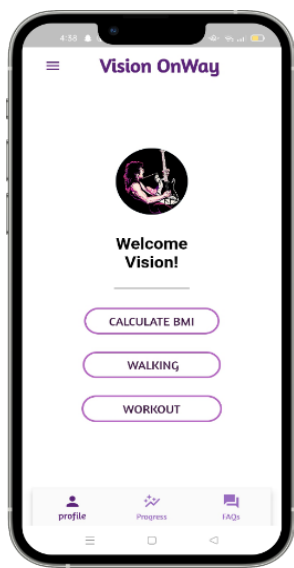


Figure 3.6 Profile Screen

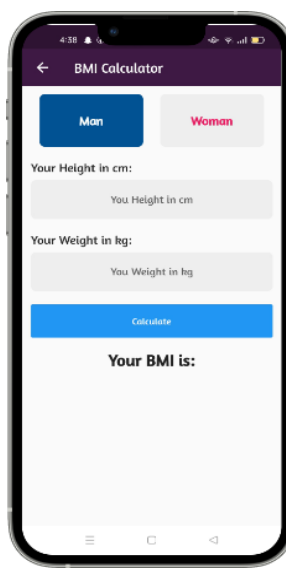


Figure 3.7 BMI Calculator

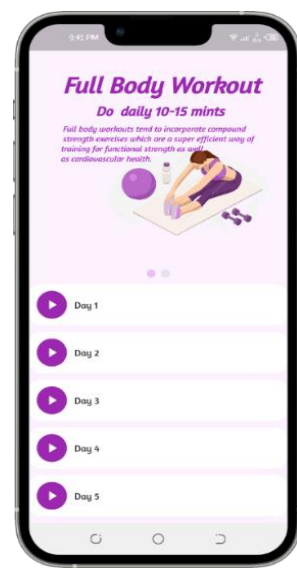


Figure 3.8 Full Body's Days

Figure 3.9 represents all the exercise present in each day. It is a whole set of each day's exercise. There is plenty of mini exercises that user should complete to achieve goals of day1. After clicking on those names present on Figure 3.10 user will navigate to Figure 3.10, here is the full video tutorial of those mini exercises. Same as Full body workout application have goals of leg workout presented in Figure 3.11. User have to complete all exercises of day 1 to achieve goals of day1 and goes on for all days.

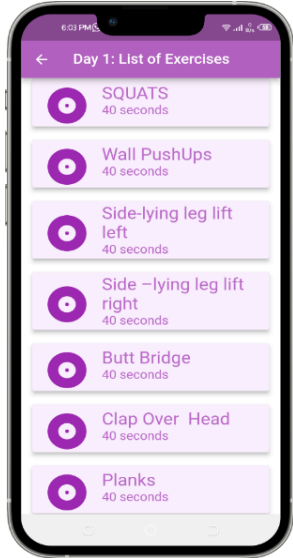


Figure 3.9 Full Body Exercise

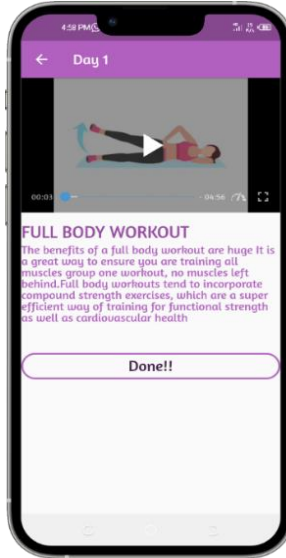


Figure 3.10 Full Body Tutorial

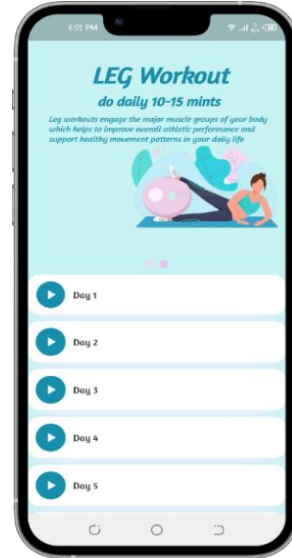


Figure 3.11 Legs Days

Same as Full body workout Legs workout has some mini videos that will complete the fitness goals of day1 of blind people. After completing tutorials of day 1 result will display at the end depicted in Figure 3.14. Same as Figure 3.14 progress of Leg workout will display at the end. Progress will retrieve according to the no of sets stored in Firebase. Progress will display on 3 columns Days, Calories and Time Duration. Progress table translates that in Day6 xyz time calories in xyz time duration.

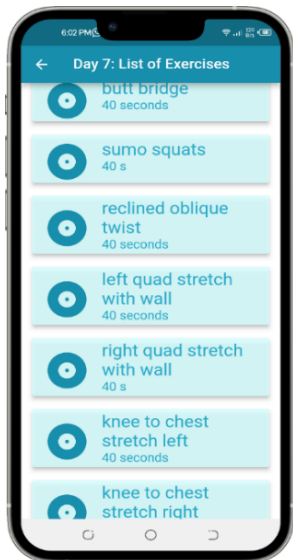


Figure 3.12 Leg Exercise

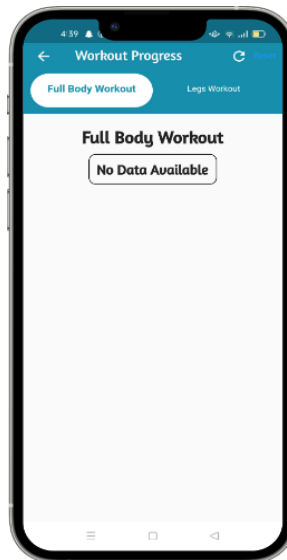


Figure 3.13 Full Body Progress

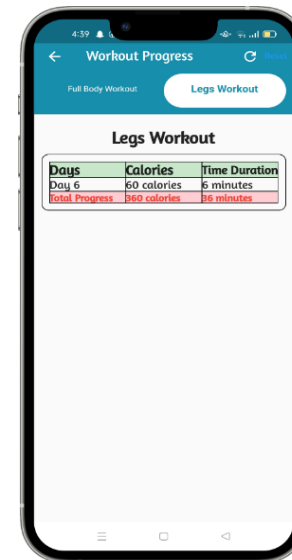


Figure 3.14 Legs Progress

Figure 3.15 depicts the Camera Screen that will navigate to path detection deep learning camera. Figure 3.16 depicts that Path detection, Figure 3.17 represents the obstacle that is person. Figure 3.18 depicts the another obstacle that is cat. Figure 3.19 depicts the situation when blind is getting off track.

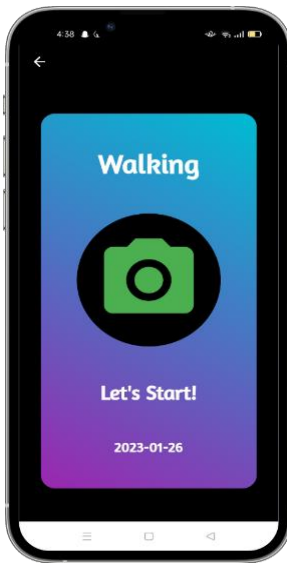


Figure 3.15 Camera Screen



Figure 3.16 Path Detection



Figure 3.17 Obstacle Detection 1

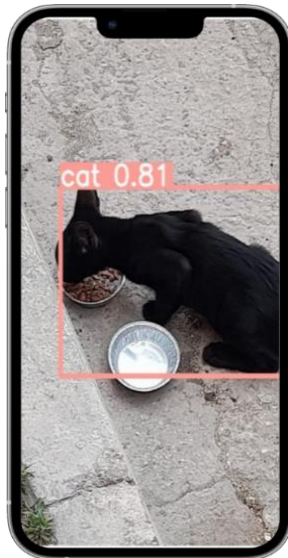


Figure 3.18 Obstacle Detection 2



Figure 3.19 Out of Path

CHAPTER 4

PROJECT PLAN

In the following chapter we will cover about planning phase of Vision onWay. We will implement. Agile methodology for the development of our project. In this chapter we will discuss different roles in our team sprint making and planning, task associated with time stamp.

4.1 PROCESS MODEL (AGILE)

The Agile Model is an incremental and iterative process of software development. It defines each iteration's number, duration, and scope in advance. Every iteration is considered a short "frame" in the agile process model, which mostly lasts from two to four weeks.

4.1.1 SCRUM

Scrum is an agile software development process, best suited for projects with rapidly changing requirements.

4.1.2 SCRUM ROLES

There are 3 scrum roles in our project planning phase.

- **PRODUCT OWNER**

Ms. Tehreem Qamar is the Product Owner for this project. She guided the team members related to features of the product and decide if what has been produced is acceptable.

- **SCRUM MASTER**

Aqsa Bano is the Scrum Master for this project.

- **SCRUM TEAM**

There were no predefined roles in our team but people tended to stick to the modules they developed and became 'experts' in their areas. Each and every task was reviewed by another team member, one that was not originally involved.

4.1.3 SPRINT PLANNING MEETING

Most of the time our sprint planning meetings went as planned, though sometimes the product owner was unavailable. In these cases, the meeting simply needed to be scheduled one or two days later. These extra days would come in handy for cleaning up what we had produced the earlier sprint.

4.1.4 SPRINT REVIEW MEETING

Our review meetings were always held on Tuesday. The project team members demonstrate new features on a live system, and answer any questions that might arise during the demo to the Product Owner. Usually, team spend one or two days before the demo checking if everything was working, and run test demonstrations internally.

4.1.5 DAILY SCRUM MEETING

Our daily Scrums took place at 10.05. The Scrum Meeting was probably of 10 to 15 minutes in which we discuss the previous day tasks and decide which task to do the next.

4.1.6 USER STORIES

In Vision onWay System, two users are involved. Each users require different functionality according to their need. Table 4.1 shows user stories.

Table 4.1 User stories

No.	As a	I want...	So that ...
1	Stakeholder	SRS report	I could check the requirements of the product.
2	Stakeholder	prototype	I could check the flow of the product.
3	Stakeholder	Static website	I could check the details of the project.
4	user	signup page	I can register myself
5	user	login page	I can register myself with voice
6	user	to create fitness profile having fields Age, weight, height.	I could add my fitness details.
7	user	to Update BMI	I could calculate my BMI.
8	user	Display my BMI	I could know my BMI.

9	Blind user	Walking Feature	I could do my walk
10	Blind user	Voice alert if I am getting distracted from path.	I could stop
11	Blind user	App will generate voice alert if found any kind of obstacle in following path	I could hear alerts and change my direction.
12	User	Workout Option	I could start my workout activity.
13	Blind user	I want audio described workout videos	I could hear and perform workout.
14	User	Have number of sets Associated with each workout videos	I could know the no. of calories burned during my workout activity
15	User	Calories burned, no sets, time will display after workout.	I could know the current details of workout.
16	User	Whole week progress will display at the end of the week.	I could know my overall calories burned in a week.
17	User	My record should maintain	I could check my progress whenever I want.
18	Blind user	App will generate voice alert if found any kind of obstacle in following path	I could hear alerts and change my direction.

4.1.7 PRODUCT BACKLOG

In Vision onWay System, the product backlog is created according to the described user stories i.e. features and functions in Table 4.2, depending on importance, the team prioritized among the stories after adding them to the backlog as shown in Tab.

Table 4.2 Product Backlog

No.	Requirements	Priority	Status
1	Idea Report	High	Completed
2	SRS Report	High	Completed
3	Prototype	High	Completed
4	Static Website	Low	Completed
5	Website Hosting	Low	Completed
6	Login Page	High	Completed
7	Signup Page	High	Completed

8	Profile Page	High	Completed
9	BMI Calculator	High	Completed
10	Dataset Collection	High	Completed
11	Path Detection	High	Completed
12	Obstacle Detection	High	Completed
13	Voice Alert	High	Completed
14	Audio described workout videos	High	Completed
15	Link videos with no of sets	High	Completed
16	Current workout result display	High	Completed
17	Weekly result display	High	Completed
18	Deployed Deep learning model with Flutter Application	High	Completed
19	Testing	Low	Completed
20	Application Deployment	High	Completed
21	Research paper	High	Completed
22	Final Report	High	Completed

4.1.8 SPRINTS PLANNING

Table 4.3 Sprint planning

Project Name	Project Manager	Start Date	End Date	Overall
Vision onWay	Ms Tehreem Qamar	1/1/2022	31/12/2022	
Project Deliverables	Idea Report SRS Report Prototype Static Website Integrated application with deep learning model. Final Report Research Paper			

Scope Statement	<p>It is a mobile application that will be developed using the Flutter SDK and the Dart language. First, the user will calculate their BMI and then, according to their BMI results, they will start their Physical activity. It will detect the path using image processing and send a voice alert if they are getting off track or find any kind of obstacle in their following path and guide them to be right path again. Our application will have audio-described workout videos and number of sets assigned to them. They will follow those videos, and after the workout, the current result will be displayed, including time and calories burned according to the number of sets done. At the end of the day, the total calories burned in a day will be displayed. Weekly progress will also be maintained in previous records. Application will process voice commands/navigation. Vision onWay will keep blind people motivated from time to time by displaying motivational words.</p>
-----------------	--

Task Name	Start Date	End Date	Team	Sizing	Definition of Done	Priority
Sprint 1- Planning						
In this sprint we will plan our project and make SRS and wireframe.	Jan 1, 22	Jan 31, 22	Aqsa, Khola, Komal, Tarooba	1 month	Complete SRS and Wireframe	High
Sprint 2 – UI/UX						
In this sprint we will work on UI/UX of our project	Feb 1, 22	Feb 28, 22	Tarooba	1 month	Complete Prototype	High
Sprint 3 – Static Website						
In this sprint we will develop static website our Project that contain all Info regarding our project.	Mar 1, 22	Mar 31, 22	Tarooba	1 month	Complete Website	High
Sprint 4– Half Application						

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In this sprint we will develop application with half features	Apr 1, 22	April 30, 22	Tarooba, Khola, Komal	1 month	Partially completed Application	High
Sprint 5 – Full Application						
In this sprint we will completely develop our application.	May 1, 22	May 31, 22	Tarooba, Khola	1 month	Complete Application	High
Sprint 6 – Dataset						
In this sprint we will collect all possible dataset and clean them	June 1, 22	June 30, 22	Aqsa	1 month	Clean Dataset	High
Sprint 7– Path Detection						
In this sprint we will make Deep Learning model using CNN Algorithm for lane detection	July 1, 22	July 31, 22	Aqsa	1 month	Path Detection model completed	High
Sprint 8– Obstacle Detection						
In this sprint we will make Deep Learning model using CNN Algorithm for obstacle detection	Aug 1, 22	Aug 31, 22	Aqsa	1 month	Obstacle Detection model completed	High
Sprint 9 – Integrated App						
In this sprint we will integrate deep learning model with Application	Sep 1, 22	Sep 30, 22	Aqsa	1 month	App integrated with DL model	High
Sprint 10– Testing						
In this sprint we will perform every type of testing in our project.	Oct 1, 22	Oct 30, 22	Komal, khola	1 month	App Tested	Low
Sprint 11 – Deployment						

In this sprint we will deploy our website and Application	Nov 1, 22	Nov 30, 22	Aqsa, Tarooba	1 month	App Deployed	Low
Sprint 12 – Project Completion						
In this application we will complete our application with proper documentation	Dec 1, 22	Dec 31, 22	Aqsa, Komal, Khola, Tarooba	1 month	Complete Project with documentation	High

4.2 TIMELINE WITH MILESTONES

Table 4.4 Timeline with Milestones

Duration	Milestone	Deliverable
Month 1	Planning	SRS, Wireframe etc.
Month 2	UI/UX Design	Prototype
Month 3	Website Development	Static Website
Month 4	Application Development	Application with half features.
Month 5	Application Development	Complete Application
Month 6	Dataset collection	Clean Dataset
Month 7	DL Model development	Lane Detection model
Month 8	DL Model development	Obstacle Detection model
Month 9	App integration with Deep learning model	Integrated App
Month 10	Testing	Tested app
Month 11	Deployment	Deployed app
Month 12	Project Completion	Complete Project with Documentation

CHAPTER 5

TEST PLAN

In chapter Test plan we will cover test cases of each and every feature of our project and testing tools of our application, website and model.

5.1 TEST CASES

Test case is nothing but a series of step executed on a product, using a predefined set of input data, expected to produce a pre-defined set of outputs, in a given environment. It describes “how” to implement those test cases. Test case specifications are useful as it enlists the specification details of the items.

Table 5.1 Signup Testing

Test Case	Expected Result	Data	Actual Result	Status
Click on signup button	App should navigate to signup page	-	App navigated to signup page	Pass
Enter data in name email and password field	Data should successfully enter	Name, email, password	Data entered	pass
Click on confirm	Confirmation message should send to your email account	-	Message sent	Pass
Enter wrong email	Email field should throw error	email	Error thrown	Pass
Enter Weak Password	Suggest Strong password	password	Suggested	Pass

Table 5.2 Login Testing

Test Case	Expected Result	Data	Actual Result	Status
Click on app icon	After splash screen login screen should appear.	-	Appeared	Pass
Enter email on field	Email should successfully enter	email	Entered	pass
Enter password	Password should write in bullet	password	Threw error	Pass

Enter wrong password	Should throw error	Password	Threw error	Pass
Enter wrong email	Email field should throw error	email	Threw error	Pass
Click login button	Should navigate to home screen	-	Navigated to home screen	Pass

Table 5.3 BMI Testing

Test Case	Expected Result	Data	Actual Result	Status
Click on BMI button	Should navigate to BMI page	-	Navigated	pass
Enter height	Should enter	Height	Height successfully entered	pass
Enter weight	Weight should successfully enter	Weight	successfully entered	pass
Click on calculate button	Calculated BMI should display	-	Displayed	pass

Table 5.8 Walking Testing

Test Case	Expected Result	Data	Actual Result	Status
Click on Walking button	Should navigate to Camera page	-	Navigated	pass
Give start command through voice	Camera screen should open and start detection	-	Open and detected	pass
Obstacle in the path	Should alert through	-	Generated Alert	pass
Command stops through	Camera screen should stop and no of steps time calories burned should display	-	Stopped and displayed	pass

Table 5.4 Workout Testing

Test Case	Expected Result	Data	Actual Result	Status
Click on workout button	Should navigate to tutorial screen	-	Navigated	pass
Give start command through voice	Camera screen should open and start detection	-	Open and detected	pass
Click on tutorial	Tutorial should start and guide through voice	-	Start and guided	pass

Stop the tutorial	Tutorial should stop and time and calories burned will display	-	Stopped and displayed	pass
-------------------	--	---	-----------------------	------

Table 5.5 Progress Testing

Test Case	Expected Result	Data	Actual Result	Status
Click on Previous record icon	Should navigate to previous records screen	-	Navigated	pass
Click on walking	Should navigate to previous record of walking	-	Navigated	pass
Click on workout button	Should navigate to previous record of workout	-	Navigated	pass
Stop the tutorial	Tutorial should stop and time and calories burned will display	-	Tutorial stopped and calories displayed.	pass

5.2 AUTOMATED TESTING TOOLS

An automation testing tool is a piece of software that lets you define testing tasks and then takes over to perform the tests for you. Ideally, this happens with minimal human oversight.

5.2.1 ACHECKER

This tool checks single HTML pages for conformance with accessibility standards to ensure the content can be accessed by everyone.

Accessibility Review

Accessibility Review (Guidelines: [Section 508](#))

Known Problems(10) Likely Problems (9) Potential Problems (57) HTML Validation CSS Validation

Line 583, Column 29: [input element type of "checkbox", missing an associated label.](#)

```
<input type="checkbox" id="cterm" value="Agreed-to-Terms" required>
```

Repair: Add a label element that surrounds the control's label. Set the `for` attribute on the label element to the same value as the `id` attribute of the control. And/or add a `title` attribute to the input element. And/or create a label element that contains the input element.

Line 693, Column 5: [script must have a noscript section.](#)

```
<script src="js/jquery.min.js"></script>
```

Repair: Add a noscript section immediately following the script that provides the same functionality as the script.

Line 695, Column 5: [script must have a noscript section.](#)

```
<script src="js/popper.min.js"></script>
```

Repair: Add a noscript section immediately following the script that provides the same functionality as the script.

Figure 5.1 Achecker

5.2.2 WIDGET_TESTING

It is a tool for testing flutter widget. Test widget is automatically generated when we create project. This test widget is connected to the main page and test all widget present in the project. Test widget test each and every widget one by one. We have continually tested our application throughout the development.

```
2 import 'package:flutter/material.dart';
3 import 'package:flutter_test/flutter_test.dart';
4
5 import 'package:flutter_yolov5_app/app.dart';
6
7 void main() {
8   testWidgets('Counter increments smoke test', (WidgetTester tester) async {
9     // Build our app and trigger a frame.
10    await tester.pumpWidget(const MyApp());
11
12    // Verify that our counter starts at 0.
13    expect(find.text('0'), findsOneWidget);
14    expect(find.text('1'), findsNothing);
15
16    // Tap the '+' icon and trigger a frame.
17    await tester.tap(find.byIcon(Icons.add));
18    await tester.pump();
19
20    // Verify that our counter has incremented.
21    expect(find.text('0'), findsNothing);
22    expect(find.text('1'), findsOneWidget);
23  });
24 }
```

Figure 5.2 Widget Testing

5.2.3 MODEL TESTING

After training weights and save our model on runs/train/exp3/weights/best.pt. We applied those weights on our testing data that saved on runs/train/exp3/test_images using detect.py python file and Figure 5.3 depicts the result of the testing

```
!python detect.py --weights runs/train/exp3/weights/best.pt --img 320 --conf 0.25 --source runs/train/exp3/test_images
```

Figure 5.3 Model testing command



Figure 5.4 Path Result



Figure 5.5 Obstacle Result 1

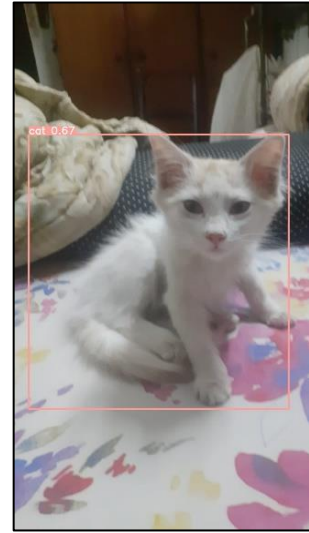


Figure 5.6 Obstacle Result 2

CHAPTER 6

IMPLEMENTATION DETAILS

In chapter 6 we have discussed about whole implementation process of our project Vision onWay. From tools and technologies that were used, then procedure to be followed during development to the deployment phase.

6.1 TOOLS AND TECHNOLOGY

Tools and Technology is a computer program used by software developers to create, edit, manage, support, and debug other applications, frameworks, and programs.

6.1.1 ADOBE ILLUSTRATOR

Adobe Illustrator is a graphic software that is use to make digital drawing, vector illustration etc. It is widely used by graphic designers[19]. We used illustrator to make prototype. We use mobile screen format to create our mobile screen layout

6.1.2 JUSTINMIND

Justinmind is a prototyping tool that is use to create UI/UX design[20]. We didn't create full prototype through justinmind but used to navigate from one screen to another. It is use for high fidelity prototype. We navigate prototype in Justin mind.

6.1.3 VISUAL PARADIGM

Visual Paradigm is an online tool that is use to make UML Diagrams. Visual Paradigm contains variety of diagrams. It is very easy to use[21]. We used Visual Paradigm for UML diagrams. We made ERD Diagram, Architecture Diagram, Data flow Diagram, Project flow diagram, Class diagram, Use Case Diagram and Activity Diagram using Paradigm.

6.1.4 VISUAL STUDIO CODE

Visual Studio Code is an IDE that supports multiple language. You can develop web and app both using Visual studio code IDE [22]. VS Code provides variety of tools [16]. We used Visual studio for both website and application development.

6.1.5 FLUTTER

Flutter is a SDK that is use to develop mobile application that supports android as well as iOS. Flutter provides thousands of widgets by which we can easily create our Application[23]. We will use Flutter SDK for app development

6.1.6 DART

Dart is a programming language that is use to create frontend of the website and application. Dart programming language is similar to C language and it supports all programming concepts like class etc. We will use dart programming language for app development.[23]

6.1.7 FIREBASE

Firebase is an online platform that is use for variety of purpose. Analytics, Authentication, Cloud messaging, Real-time database, Crashlytics, Performance, Test lab etc. [24]. We used firebase for backend and Database

6.1.8 GOOGLE COLAB

Google Colab is an online IDE that support high end computation like Machine Learning and Deep Learning [25].We used Google Collab for our path detection and obstacle detection model.

6.1.9 PYTHON

Python is an object-oriented, dynamically semantic programming language. It is particularly desirable for Rapid Application Development as well as for usage as a scripting or glue language to tie existing components together due to its high-level built in data structures, dynamic typing, and dynamic binding[26]

6.1.10 DEEP LEARNING

Deep Learning is a subset of machine learning. Deep learning works on the base of Artificial Neural Network[16]. We will use Deep Learning Model for lane detection and obstacle detection.

6.1.11 YOLOV5

YOLOv5 is a family of compound-scaled object detection models trained on the COCO dataset, and includes simple functionality for Test Time Augmentation (TTA),

model ensembling, hyperparameter evolution, and export to ONNX, CoreML and TFLite [26].

6.1.12 LABELIMG

LabelImg is a graphical image annotation tool which allows you to draw visual boxes around your objects in each image, it also automatically saves the XML files of your labelled images. It is a free and easy way to label your images [27].

6.2 DATA DICTIONARY

A Data Dictionary is a collection of names, definitions, and attributes about data elements that are being used or captured in a database, information system, or part of a Vision onWay.

6.2.1 USER

Table 6.1 User entity

Attribute name	Data Type	Constraint	Description
User_id	int	Primary key	Unique_id of user, Auto generated
Name	varchar	Not null	Name of user
Email	varchar	Not null	Unique Email of user
Age	int	Not null	Derived Attribute, Age of user
Password	varchar	Not null	Password of user
DOB	varchar	Not null	Date of birth of user
Height	Int	Not null	Height of user
BMI	int	Not null	Derived Attribute, BMI of user
Gender	varchar	Not null	Gender of user
Initial weight	int	Not null	Initial weight of User

6.2.2 EXERCISE

Table 6.2 Exercise Entity

Attribute name	Data Type	Constraint	Description
exercise_id	int	Primary key	Unique_id of Exercise, Auto generated

Exercise Name	varchar	Not null	Names of Exercise
No of sets	int	Not null	No sets performed to burn calories
Time	varchar	Not null	No of sets performed in a time interval
Calories Burned	float	Not null	Calories burned after number of sets performed in a time interval

6.2.3 PROGRESS

Table 6.3 Progress Entity

Attribute name	Data Type	Constraint	Description
progress_id	int	Primary key	Unique id of progress, Auto generated
User_id	int	Foreign key	Progress of which user
Exercise_id	int	Foreign key	Which exercise performed
Sets	int	null	No of sets performed
Steps	int	null	No of steps by user
Weight	float	null	Weight of user after workout or walking
Exercise Calories burned	float	null	Calories burned after workout
Walk Calories burned	float	null	Calories burned after walking
Time	Time	Not null	Total duration of walk and workout
Date	Varchar	Not null	Date of progress

6.2.4 TUTORIALS

Table 6.4 Tutorials Entity

Attribute name	Data Type	Constraint	Description
tutorial_id	int	Primary key	Unique id of tutorial, Auto generated
type	Varchar	Not null	Type of tutorial
link	varchar	Not null	Link of tutorial
Exercise_id	int	Foreign key	X Y Z tutorial belongs to X Y Z exercise

6.3 DATASET

We have two types of dataset one for path detection and second for obstacle detection. For path detection we have collected 3000 images from local parks in Pakistan and for obstacle detection we have collected 2000 images from kaggle. After clean all dataset we annotated those images using labeling tool. We annotated dataset in txt format. In path detection there is also 3 sub types, center, left and right. We captured 1000 dataset from center in path, 1000 from slightly right side and 1000 from slightly left side.



Figure 6.1 Dataset

6.4 VERSION CONTROL

We used Github Repository Management to share our project to one another and maintain our project's version. We created a repository of our project Vision onWay and collaborate on our project's files. We commit changes through Github Desktop.

6.4.1 VERSION 1

Here is our project's github link for FYP I.

https://github.com/Vision-onWay/Vision_onWay_fyp1.git

6.4.2 VERSION 2

Here is our project's github link for FYP II.

https://github.com/Vision-onWay/Vision_onWay_fyp2.git

6.5 WEBSITE DEVELOPMENT

Our website is basically a static website. We stored info regarding our project Vision onWay. There are 3 sections in our project Home Features and Contact. In Home sections gives you the brief intro of our project with logo screen. Second one is Feature in this second, we discussed our two main features Walking and Exercise as well as some other features like BMI calculator step counter Etc. We also showed our project flow and

all the screens of our app. Last section is contact with Name Email and Message field and a submit button. Website is developed using Html CSS and JavaScript. User directly navigate to play store using option in website and download our app.

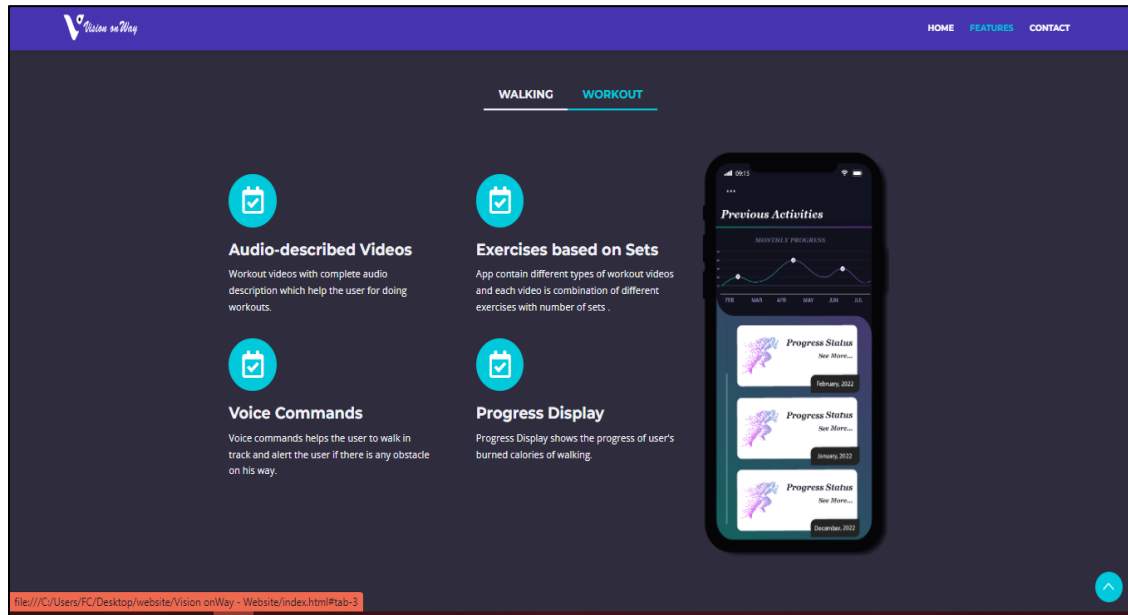


Figure 6.2 Website Screen 1

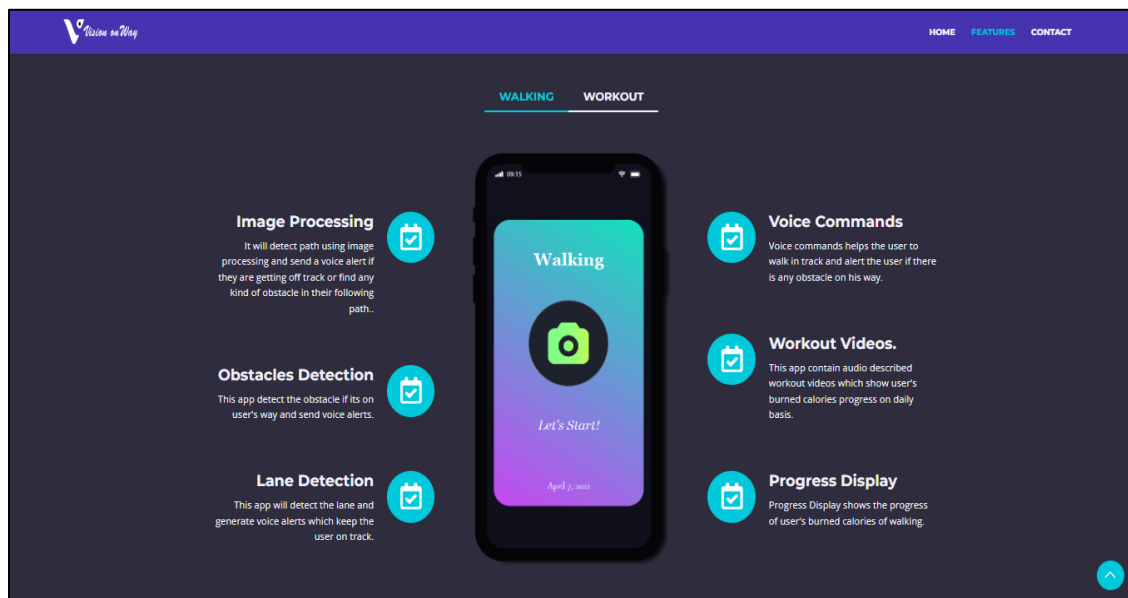


Figure 6.3 Website Screen 2

6.6 MOBILE APPLICATION DEVELOPMENT

Variables stores the value of name email and password. On pressed method perform the action of signup after getting the values

Chapter 6. Implementation Details

```
RoundedElevatedButton(
  onPressed: () {
    if (_formKey.currentState!.validate()) {
      String name = _nameController.text.trim();
      String email = _emailController.text.trim();
      String password = _passwordController.text;
      authController.signIp(name, email, password);
    }
  }
)
```

On pressed accept values and perform login through elevated button.

```
RoundedElevatedButton(
  title: 'Sign in',
  onPressed: () {
    if (_formKey.currenState!.validate()) {
      String email = _emailControlle.text.trim();
      Strig password = _passwordController.text;
      _authController.signIn(email, password);
    }
  }
)
```

On pressed accept values and perform login through elevated button. On pressed use reset method to pass the email

```
RoundedElevatedButton(
  title: 'Sign in',
  onPressed: () {
    if (_formKey.currenState!.validate()) {
      _authController.resetPassword(_emailController.text.trim());
    }
  },
  Padding : EdgeInsets.symmetric(
    Horizontal; Config.screenWidth! * 0.32,
    Vertical; Config.screenHeight! * 0.02),
),
```

On pressed accept value through FlatButton.On pressecuse height controller method.

```
Container(
  Width: double.infinity,
  Height: 50.0,
  Child: FlatButton(
    onPressed: () {
      setState(() {
        height = double.parse(heightController.value.text);
        weight = double.[arse(heightController.value.text);
      });
      CalculateBmi(height, weight);
    },
    Color: Colors.blue,
    Child: Text("Calculлятор", style: TextStyle(
      Color: Colors.white,
    ),
  ),
),
```

OnTap() function applied in Gesture detection which opens the mobile camera.

```
RoundedElevatedButton(
  Title: 'walking',
  onPressed: () {
    _authController.walking();
  }
)
```

```

        Navigator.pf(Context).push(MaterialPageRoute(
            Builder: (context) => WalkingScreen(),
        ));
    },
    Padding: EdgeInsets.symmetric(
        Horizontal: Config.screenwidth! * 0.3,
    )),
),),

```

List of card widget which open the workout videos.

```

DailogBox(VideoPlayerController_controller){
    showDialog(
        context: context,
        builder: (context) => Workout(
            title: Container(
                width: 200,
                height: 200,
            ),
        ),
    ),
    RoundedElevatedButton(
        Title: 'walking',
        onPressed: () {
            _authController.walking();
            Navigator.pf(Context).push(MaterialPageRoute(
                Builder: (context) => WalkingScreen(),
            ));
        },
        Padding: EdgeInsets.symmetric(
            Horizontal: Config.screenwidth! * 0.3,
        )),
    ),
),

```

Card of Pushups: by applying on press function on the card which open new UI of Pushups video and perform "play" "pause" and "close" the UI of this video.

```

Widget
build(BuildContext
context) {
    return Scaffold(
        appBar: AppBar(
            title: Text(
                'Day 6',
                style: TextStyle(
                    fontSize: 21, color: Color.fromARGB(255,
255, 255, 255)),
            ),
            elevation: 1.0,
            backgroundColor: Color.fromARGB(255, 22, 142,
172),
            leading: IconButton(
                onPressed: () {
                    Navigator.of(context).pop();
                },
                color: Color.fromARGB(255, 255, 255, 255),
                icon: Icon(Icons.arrow_back),
            ),
        ),
    ),
),

```

Card for Jumping jacks: by applying on press function on the card which open new UI of Jumping jacks video and perform "play" "pause" and "close" the UI of this video.

```

DailogBox(VideoPlayerController_controller){
    showDialog(
        context: context,
        builder: (context) => Workout(
            title: Container(

```

```
        width: 200,
        height: 200,
    ),
    RoundedElevatedButton(
        Title: 'walking',
        onPressed: () {
            _authController.walking();
            Navigator.of(context).push(MaterialPageRoute(
                Builder: (context) => WalkingScreen(),
            ));
        },
        Padding: EdgeInsets.symmetric(
            Horizontal: Config.screenWidth! * 0.3,
        ),
    ),
),
```

Card for Yoga: by applying on press function on the card which open new UI of Yoga video and perform "play" "pause" and "close" the UI of this video. onTap() function applied in Gesture detection which opens the mobile camera.

```
GestureDetector(
    onTap: () {
        Navigator.of(context).push(MaterialPageRoute(
            builder: (context) => OpenCamera(
                cameras: _camera!,
            ),
        ));
    },
)
```

onPressed function applied on rounded elevated button which navigates the workout page

```
GestureDetector(
    onTap: () {
        Navigator.of(context).push(MaterialPageRoute(
            builder: (context) => OpenCamera(
                cameras: _camera!,
            ),
        ));
    },
)
```

When we go for workout exercises the YouTube video will guide user to perform exercise, we use YouTube player controllers for this feature. When we click on day 1 for workout exercise the day 1 video will start to guide the user. The same process is done for all 7 days of a week, so user can perform exercise every day in a week.

```
RoundedElevatedButton(
    title: 'Sign in',
    onPressed: () {
        if (_formKey.currentState!.validate()) {
            _authController.resetPassword(_emailController.text.trim());
        }
    },
    padding: EdgeInsets.symmetric(
        Horizontal: Config.screenWidth! * 0.32,
        Vertical: Config.screenHeight! * 0.02,
    ),
),
```

Workout progress report is generating through Firebase Database, we have separated the both features UI screens; Full Body Workout & Legs Day. So that the both progresses will generate separately in a table form.

```
DailogBox(VideoPlayerController_controller){
  showDialog(
    context: context,
    builder: (context) => Workout(
      title: Container(
        width: 200,
        height: 200,
        RoundedElevatedButton(
        Title: 'walking',
        onPressed: () {
          _authController.walking();
          Navigator.pf(context).push(MaterialPageRoute(
            Builder: (context) => WalkingScreen(),
          )),);
        },
        Padding: EdgeInsets.symmetric(
          Horizontal: Config.screenwidth! * 0.3,
        )),),
  ),),
```

When we are performing Full Body Workout, have done with day 1 exercises & tab the DONE button right down in a video the Calories, & Time Duration of this video will be add in Firestore Database table for Day 1 till day 7, so the whole week progress table will generate after completion of the videos. Same procedure is applying with the Legs Workout feature.

```
GestureDetector(
  onTap: () {
    Navigator.of(context).push(MaterialPageRoute(
      builder: (context) => OpenCamera(
        cameras: _camera!,
      ),
    ),
  ),
),
```

In both features; Full Body Workout & the Legs Workout the calories & time duration calculate every day then show the result of the week so that we are able to see the whole week progress in the end.

6.7 MODEL CONSTRUCTION

After annotating 5000 images we trained our model with yolov5. First, we import different python libraries like torch, pillow, cv2, PIL, IProgress, tqdm, ipy widgets etc. then we cloned yolov5 github repository from by implementing following command! git clone <https://github.com/ultralytics/yolov5>. After cloning repo, we moved to that repo and start training our images using train.py python file and made weights that saved on specified directory. First, we train our datasets on 200 epochs and 320 of initial image size

but the result was not satisfied than we applied 500 epochs and 640 of image size. Then the result was very satisfied. The Mean average precision value is rising you can see in Figure 6.4.

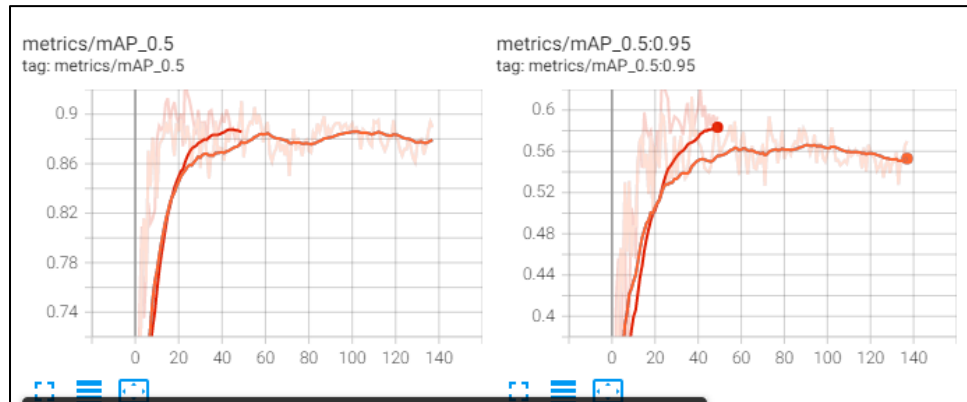


Figure 6.4 mAP chart

Figure 6.5 shows the instances of our classes' person has more instances there is more than one picture in many dataset images and path has very low path because in every picture there is only path.

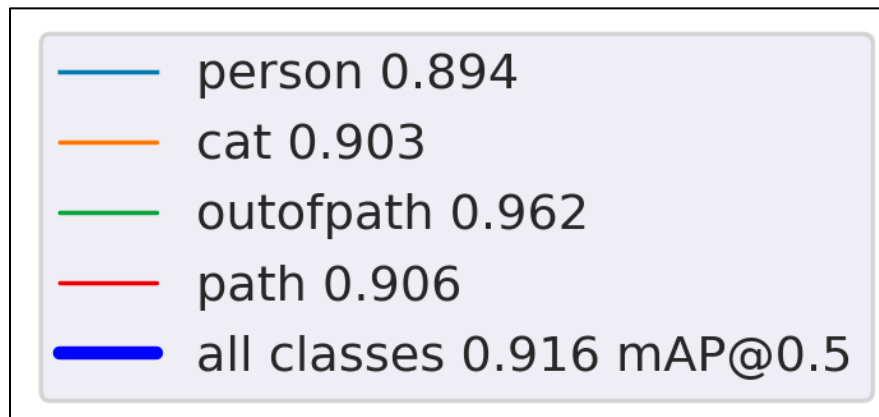


Figure 6.5 instances of classes

Figure 6.6 depicts the result of dataset that generated during training

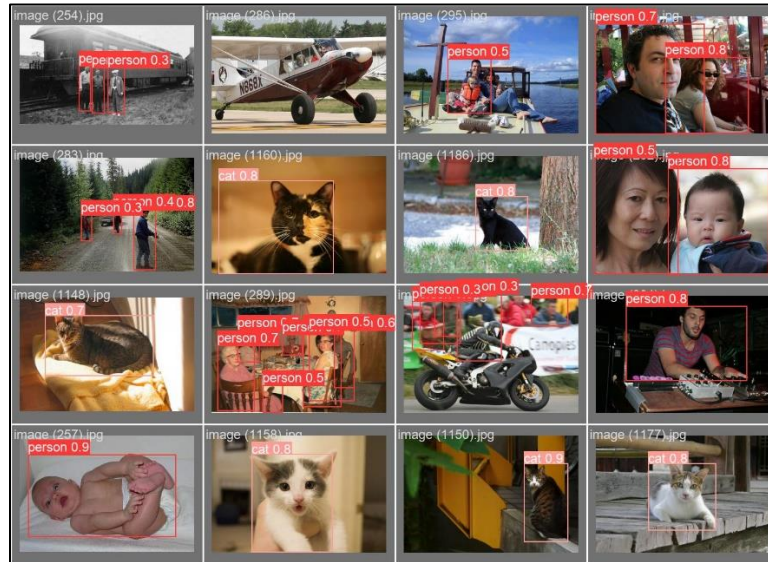


Figure 6.6 Batch value result

6.8 DEPLOYMENT

Deployment in software and web development means pushing changes or updates from one deployment environment to another. When setting up a website you will always have your live website, which is called the live environment or production environment.

6.8.1 MODEL DEPLOYMENT

We made Deep learning model of path detection and obstacle detection and obstacle detection then convert it to tflite format for deploying on our flutter application. We converted our yolov5 weight file into tflite format using the following command.

```
!python export.py --weights runs/train/exp3/weights/best.pt --include tflite --img 300
export: data=data/coco128.yaml, weights=['runs/train/exp3/weights/best.pt'], imgsz=[300], batch_s
fatal: cannot change to '/content/drive/MyDrive/object': No such file or directory
YOLOv5 2023-1-16 Python-3.8.16 torch-1.13.0+cu116 CPU
```

Figure 6.7 tflite converter

Then we deployed our tflite model in flutter application. Figure 6.8 depicts the parameter that we extracted from our model to display on flutter including initial image size, No of classes, Object confession Threshold and Class Confession Threshold.


```
/// image size into interpreter
static const int inputSize = 320;

ImageProcessor? imageProcessor;
late List<List<int>> _outputShapes;
late List<TfLiteType> _outputTypes;

static const int clsNum = 04;
static const double objConfTh = 0.25;
static const double clsConfTh = 0.25;
```

Figure 6.8 Flutter Deployment

6.8.2 WEBSITE HOSTING

We deployed our static website using firebase First we create project on firebase than we initialize firebase on our website's folder and then host our website using cmd. Here is the hosted website link of Vision onWay.

<https://vision-onway-5869e.web.app/>

Scan to reach our website.



CHAPTER 7

CONCLUSION AND FUTURE WORK

In recent years fitness is the largest talk in the market but it is quite challenging for blind people due to many reasons. Some of the main reasons are fear of getting hurt or cannot find suitable assets. Vision onWay is providing a platform for visually impaired that will fade their fear by detecting paths and generate alert if they distract from their path during walking on park's track and guide them where to move to be on the right path again and motivate them to take care of their health. We worked on 5000 datasets 3000 images are related to path and 2000 images are related to obstacle detection. We use the yolov5 algorithm to train our model. Workout tutorials give them instructions that how to work out and burn calories. Vision onWay provide them complete details regarding their fitness status and track their fitness schedules. Vision onWay believes the independency of blind that's why our future goal is to improve our accuracy and performance in path detection by working on more datasets and add more classes on obstacle section. We will reach on variety of local parks in Pakistan and collect dataset. We will add more workout videos in Workout section. Our main future goal is to market our project on high note so that every blind person who is looking for independent fitness can reach to our product and take benefits from it.

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APPENDIX A

SCREENSHOTS

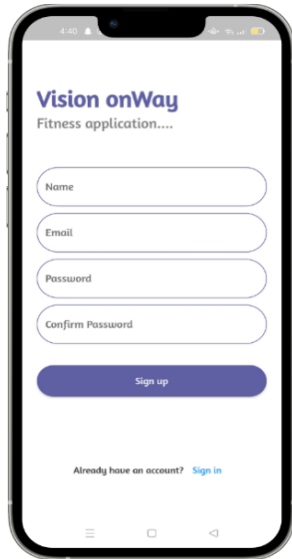


Figure A.1 Signup

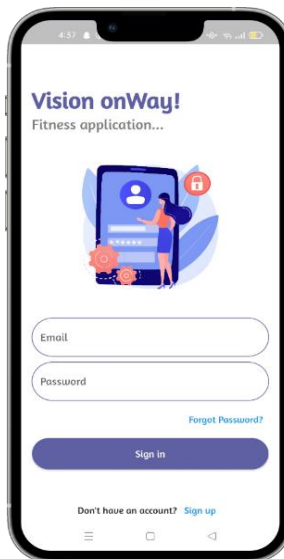


Figure A.2 Login

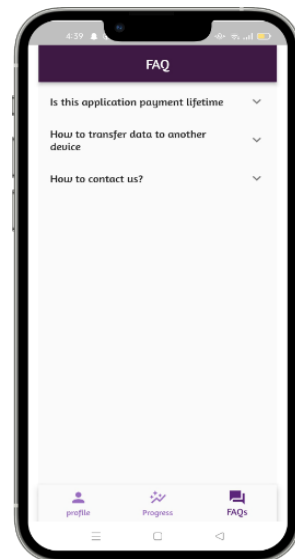


Figure A.3 FAQ

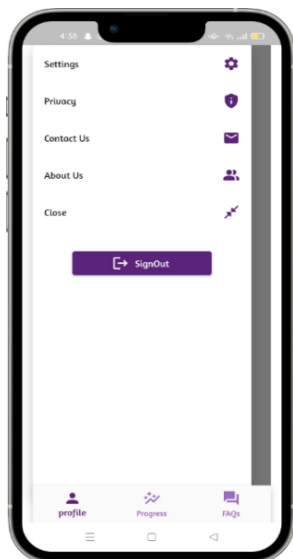


Figure A.4 Settings

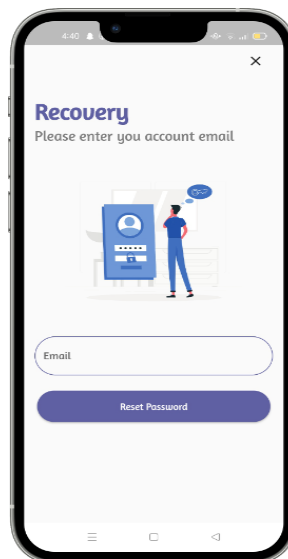


Figure A.5 Forgot Password

APPENDIX B

ABBREVIATION

AI	= Artificial Intelligence.
ML	= Machine Learning.
DL	= Deep Learning.
CNN	= Convolutional Neural Network.
HTML	= Hypertext Markup Language.
CSS	= Cascading Style Sheet.
JS	= JavaScript.
MVC	= Model View Controller Architecture.
UML	= Unified Modelling Language.
ERD	= Entity Relationship Diagram.
YOLO	= you only see once.
IDE	= Integrated Development Environment.
PT	= PyTorch.
CSV	= Comma Separated Value.
FTTS	= Flutter Text to speech.
OB	= Object Detection.
mAP	= Mean Average Precision
NMS	= Non Maximum Suppression
Yaml	= yet another markup language
Git	= Global Information Tracker

Vision onWay

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AQSA BANO

Frontend Web Developer and
Graphic Designer

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 03302838759

SKILLS

FRONTEND WEB

- HTM
- CS
- Bootstrap
- Javascript
- PHP
- Firebase

GRAPHIC

- Adobe illustrator
- Adobe Photoshop

ACTIVITIES

- Book Reading
- Content Writing
- Crafting
- Sketching
- Calligraphy

SOFTSKILLS

- Honesty & loyalty.
- Punctuality, Determination and Persistence.
- Self-motivated and ability to take the initiative.
- Able to work well under pressure & Quick learner.
- Team leadership.
- Technically Competent.

OBJECTIVE

A competent individual possessing sharp problemsolving skills and proactive understanding. Know well about team collaboration and being patient under all circumstances of conflicts within a team. The ability to think rationally drives the process of efficient decision making.

EDUCATION

Matriculation in Science

Al Manar Model School - Malir,
Karachi Mar 2014 - Mar 2016

Intermediate in Pre Engineering

Govt. College for Women Saudabad - Malir, Karachi
Sep 2016 - Apr 2018

Bachelors in Software Engineering

Jinnah University for Women - Nazimabad, Karachi
Jan 2019 - Dec 2022

CGPA: 3.52

PROJECTS

FYP: Vision OnWay:

Fitness application for blind people that uses flutter, firebase and deep learning.

Royal Galaxy:

A complete hotel's website that uses HTML, CSS, Javascript, PHP.

Saylani Website :

Complete website of saylani welfare trust that uses HTML, CSS, Javascript, React and firebase.

Digital Periodic Table :

A digital periodic table that is clickable and uses voice. It uses Html, CSS, python for backend. **Standee,**

Poster, Visiting Card, Logo Etc.

I make these with Adobe Illustrator and Adobe Photoshop

CERTIFICATINS

- Graphic Designing, Freelancing, and Content Writing Certifications from **Digiskills.**
- Graphic Designing, Frontend Web Developer.
- Freelancing Certification from **Jawan Pakistan.**

KHOLA AUSAF
Address: I-2272 GULZAR E HIJRI 4/1 ,METROVIL COLONY,KARACHI
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Email: kholaausaf@gmail.com

CAREER OBJECTIVE

I am seeking opportunities to join a company that can help me in enhancing my skills, strengthening my knowledge and increasing my potential. I am willing to explore a wide variety of opportunities that can help me gain perspective. A highly motivated software engineer seeking to get a position in a reputed company, where I can use my skills and knowledge to learn new things and grow as a software developer.

EDUCATION

IN PROGRESS

B S (SOFTWARE ENGINEERING)

JINNAH UNIVERSITY FOR WOMENS, KARACHI PAKISTAN CGPA: 2.83

YEAR 2018

HSC (PRE-ENGINEERING)

SIR SYED GOVT GIRLS COLLEGE

YEAR 2016

SSC.SCIENCE,

IDEAL FEDERAL SECONDARY SCHOOL

SEMINAR

FEB-2020 AND FEB-2021

ONE DAY SEMINAR JTECH,

JINNAH UNIVERSITY FOR WOMENS, KARACHI PAKISTAN

In this seminar I was the volunteer at discipline comity in feb-2020 and also volunteer at event management comity in feb-2021

PROJECTS

- SUPERMARKET WEBSITE
- RESTAURANTS MANAMGMENT
- QUIZ GAME
- Expert Event Agent
- Vision On Way

SKILLS

- Web designing: HTML/CSS/SCSS
- Programming Language: PYTHON/JAVA
- Tools: MS WORD, POWER POINT, EXCEL
- Computer Networking
- Operating system: Windows, Linux
- Android Studio
- Visual studio code: Flutter
- Bootstrap
- java script
- PHP
- Hardware
- MYSQL server
- Management
- Problem solving

ACTIVITIES

- Art and drawing
- Cooking
- Home organizer
- Volunteering
- Searching related to project
- Mehndi artist

Komal Bakhtiar

Malir city, Karachi, Pakistan · 03493732047

Komalbakhtiar1@gmail.com

CAREER OBJECTIVE

A passionate flutter developer with highly problem-solving skills, collaborative and team work nature. Being patient under all circumstances. Looking forward for a job and want to serve as much as I can.

EDUCATION

J_{AN} 2019 - P_{RESENT}

BACHELOR, JINNAH UNIVERSITY FOR WOMEN.

Software Engineering

2017 - 2018 INTERMEDIATE, GOVT. DEG. Sci.& Com. Gulshan Iqbal block 7.

Pre-Engineering

2015 - 2016 MATRICULATION, Al Manar Public School.

Biology

PROJECTS

2019

Airline Reservation System

By using the *PYTHON* programming language.

2019

Pizza House Website

By using *HTML*, *CSS* & *Bootstrap*

2022-present

Vision onWay

By Using *Flutter* & *Deep Learning Model*

SKILLS

- Flutter
- HTML
- CSS
- JAVASCRIPT
- Bootstrap
- Visual Studio Code
- Adobe Illustrator
- Python

ACTIVITIES

- UI Designing
- Research Papers Reading
- Logo Designing
- Video Editing

