VISVESVARAYA TECHNOLOGICAL UNIVERSITY

"Jnana Sangama", Belagavi-590018

INTERNSHIP REPORT

ON

"Blind Assist using M.L"

Submitted in partial fulfilment for the award of degree(18CSI85)

BACHELOR OF ENGINEERING IN
Computer Science & Engineering

Submitted by:

SUPRITHA
K L

1CD19CS168

Conducted at
SAIN INFORMATIX Pvt. Ltd.

CAMBRIDGE INSTITUTE OF TECHNOLOGY

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

Accredited by NBA, New Delhi

K R PURAM, BENGALUR 560036,KARNATAKA,INDIA.

CAMBRIDGE INSTITUTE OF TECHNOLOGY
Department of Computer Science &Engineering
Accredited by NBA, New Delhi

KR Puram, Bengaluru – 560 036

CERTIFICATE

This is to certify that the Internship titled **"Blind Assist using M.L"** carried out by **Ms. Supritha K L,** a bonafide student of **Cambridge Institute of Technology**, in partial fulfillment for the award of **Bachelor of Engineering** , **COMPUTER SCIENCE AND ENGINEERING** under Visvesvaraya Technological University, Belagavi, during the year 2022-2023. It is certified that all corrections/suggestions indicated have been incorporated in the report.

The project report has been approved as it satisfies the academic requirements in respectof Internship prescribed for the course Internship / Professional Practice (18CSI85)

Signature of Guide **Signature of HOD** **Signature of Principal**

External Viva:

Name of the Examiner Signature with Date

1)_____

_____

2)_____

_____

DECLARATION

I, **Supritha K L**, final year student of **Computer Science & Engineering ,Cambridge Institute of Technology** - 560 036, declare that the Internship has been successfully completed, in **SAIN INFORMATIX Pvt Ltd** . This report is submitted in partial fulfillment of the requirements for award of Bachelor Degree in **Computer Science & Engineering**, during the academic year 2022-2023.

Date : 25-09-22 :

Place : Bengaluru

USN : **1CD19CS168**

NAME : **SUPRITHA K L**

OFFER LETTER

INTERNSHIP OFFER LETTER

Date: **23rd August, 2022**

Name: **Supritha Kl**
USN: **1CD19CS168**

Dear Student,

We would like to congratulate you on being selected for the **Machine Learning With Python(Research Based)** Internship position with **Sain Informatix Pvt Ltd**, effective Start Date **23rd August, 2022**, All of us are excited about this opportunity provided to you!

This internship is viewed as being an educational opportunity for you, rather than a part-time job. As such, your internship will include training/orientation and focus primarily on learning and developing new skills and gaining a deeper understanding of concepts of **Machine Learning With Python(Research Based)** through hands-on application of the knowledge you learn while you train with the senior developers. You will be bound to follow the rules and regulations of the company during your internship duration.

Again, congratulations and we look forward to working with you!

Sincerely,

Santhu
Product Manager
SAIN INFORMATIX PVT LTD
Bangaluru, India

A C K N O W L E D G E M E N T

This Internship is a result of accumulated guidance, direction and support of several important persons. We take this opportunity to express our gratitude to all who have helped us to complete the Internship.

We express our sincere thanks to our Principal, for providing us adequate facilities to undertake this Internship.

We would like to thank our Head of Dept , for providing us an opportunity to carry out Internship and for her valuable guidance and support.

We would like to thank Sain Informatix Software Services for guiding us during the period of internship.

We express our deep and profound gratitude to our guide, Guide name, Assistant/Associate Prof, for her keen interest and encouragement at every step in completing the Internship.

We would like to thank all the faculty members of our department for the support extended during the course of Internship.

We would like to thank the non-teaching members of our dept, for helping us during the Internship.

Last but not the least, we would like to thank our parents and friends without whose constant help, the completion of Internship would have not been possible.

SUPRITHA K L
1CD19CS168

ABSTRACT

The Internet has become an essential means for people to acquire Knowledge and communicate.Today, in 21st century , the internet has eased our life to a significant extent . Unfortunately , the benefits of this mighty tool arestill away from visually impaired people who find difficulty accessing the web . Approximately 2.2 Billion people worldwide are visually impaired . Over the years , people built different tools and technologies that can assist the blind in reaching out to the outside world . As technology has made life simpler for everyone , including Visually Impaired people . Not only these , there is a voice assistance when the app is started and for every functionalities the voice assistance is provided .

According to the estimates from the World Health Organization (WHO), around 39 million people across the globe are suffering from complete blindness and around 246 million have low vision i.e. severe or moderate visual impairment. Some of the major difficulties faced by them include unable to use smartphones to perform basic functionalities like messaging or calling, navigation problems, recognizing different denominations which further lead to inaccessibility in getting involved in day-to-day chores. Therefore, visually impaired people thus need an assistive tool to help them cope with these difficulties and simplify them to an extent.

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CHAPTER -1
COMPANY PROFILE

A Brief History of Sain Informtaix pvt ltd

Sain Informatix , was incorporated with a goal ”To provide high quality and optimal Technological Solutions to business requirements of our clients”. Every business is a different and has a unique business model and so are the technological requirements. They understand this and hence the solutions provided to these requirements are different as well. They focus on clients requirements and provide them with tailor made technological solutions. They also understand that Reach of their Product to its targeted market or the automation of the existing process into e-client and simple process are the key features that our clients desire from Technological Solution they are looking for and these are the features that we focus on while designing the solutions for their clients.

Sarvamoola Software Services. is a Technology Organization providing solutions for all web design and development, MYSQL, PYTHON Programming, HTML, CSS, ASP.NET and LINQ. Meeting the ever increasing automation requirements, Sarvamoola Software Services. specialize in ERP, Connectivity, SEO Services, Conference Management, effective web promotion and tailor-made software products, designing solutions best suiting clients requirements.

Sain Informatix, strive to be the front runner in creativity and innovation in software development through their well-researched expertise and establish it as an out of the box software development company in Bangalore, India. As a software development company, they translate this software development expertise into value for their customers through their professional solutions.

They understand that the best desired output can be achieved only by understanding the clients demand better. Sain Informatix work with their clients and help them to defiine their exact solution requirement. Sometimes even they wonder that they have completely redefined their solution or new application requirement during the brainstormingsession, and here they position themselves as an IT solutions consulting group comprising of high caliber consultants.

They believe that Technology when used properly can help any business to scale and achievenew heights of success. It helps Improve its efficiency, profitability, reliability; to put it in one sentence ” Technology helps you to Delight your Customers” and that is what we wantto achieve.

CHAPTER-2
ABOUT THE COMPANY

Sain Informatix is a Technology Organization providing solutions for all web design and development, MYSQL, PYTHON Programming, HTML, CSS, ASP.NET and LINQ. Meeting the ever increasing automation requirements, Sain Informatix specialize in ERP, Connectivity, SEO Services, Conference Management, effective web promotion and tailor-made software products, designing solutions best suiting clients requirements. The organization where they have a right mix of professionals as a stakeholders to help us serve our clients with best of our capability and with at par industry standards. They have young, enthusiastic, passionate and creative Professionals to develop technological innovations in the field of Mobile technologies, Web applications as well as Business and Enterprise solution. Motto of our organization is to "Collaborate with our clients to provide them with best Technological solution hence creating Good Present and Better Future for our client which will bring a cascading a positive effect in their business shape as well". Providing a Complete suite of technical solutions is not just our tag line, it is Our Vision for Our Clients and for Us, We strive hard to achieve it.

Products of Sain Informatix

Android Apps

It is the process by which new applications are created for devices running the Android operating system. Applications are usually developed in Java (and/or Kotlin; or other such option) programming language using the Android software development kit (SDK), but other development environments are also available, some such as Kotlin support the exact same Android APIs (and bytecode), while others such as Go have restricted API access.

The Android software development kit includes a comprehensive set of development tools. These include a debugger, libraries, a handset emulator based on QEMU, documentation, sample code, and zutorials. Currently supported development platforms include computers running Linux (any modern desktop Linux distribution), Mac OS X 10.5.8 or later, and Windows 7 or later. As of March 2015, the SDK is not available on Android itself, but softwaredevelopment is possible by using specialized Android applications.

Web Application

It is a client–server computer program in which the client (including the user interface and client- side logic) runs in a web browser. Common web applications include web mail, online retail sales, online auctions, wikis, instant messaging services and many other functions. web applications use web documents written in a standard format such as HTML and JavaScript,which are supported by a variety of web browsers. Web applications can beconsidered as a specifific variant of client–server software where the client software is downloaded to the client machine when visiting the relevant web page, using standard procedures such as HTTP. The Client web software updates may happen each time the web page is visited. During the session, the web browser interprets and displays the pages, and acts as the universal client for any web application. The use of web application frameworks can often reduce the number of errors in a program, both by making the code simpler, and by allowing one team to concentrate on the framework while another focuses on a specifified use case. In applications which are exposed to constant hacking attempts on the Internet, security-related problems can be caused by errors in the program.

Frameworks can also promote the use of best practices such as GET after POST. There are some who view a web application as a two-tier architecture. This can be a “smart” client that performs all the work and queries a “dumb” server, or a “dumb” client that relies on a “smart” server. The client would handle the presentation tier, the server would have the database (storage tier), and the business logic (application tier) would be on one of them or on both. While this increases the scalability of the applications and separates the display and the database, it still doesn‟t allow for true specialization of layers, so most applications will outgrow this model. An emerging strategy for application software companies is to provide web access to software previously distributed as local applications. Depending on the type of application, it may require the development of an entirely different browser-based interface, or merely adapting an existing application to use different presentation technology. These programs allow the user to pay a monthly or yearly fee for use of a software application without having to install it on a local hard drive. A company which follows this strategy is known as an application service provider (ASP), and ASPs are currently receiving much attention in the software industry.

Security breaches on these kinds of applications are a major concern because it can involve both enterprise information and private customer data. Protecting these assets is an important part of any web application and there are some key operational areas that must be included in the development process. This includes processes for authentication, authorization, asset handling, input, and logging and auditing. Building security into the applications from the beginning can be more effective and less disruptive in the long run.

Web design

It is encompasses many different skills and disciplines in the production and maintenance of websites. The different areas of web design include web graphic design; interface design,

search engine optimization. The term web design is normally used to describe the design process relating to the front-end (client side) design of a website including writing mark up. Web design partially overlaps web engineering in the broader scope of web development. Web designers are expected to have an awareness of usability and if their role involves creating mark up then they are also expected to be up to date with web accessibility guidelines. Web design partially overlaps web engineering in the broader scope of web development.

Departments and services offered

Compsoft Technologies plays an essential role as an institute, the level of education, development of student's skills are based on their trainers. If you do not have a good mentor then you may lag in many things from others and that is why we at Compsoft Technologies gives you the facility of skilled employees so that you do not feel unsecured about the academics. Personality development and academic status are some of those things which lie on mentor's hands. If you are trained well then you can do well in your future and knowing its importance of Compsoft Technologies always tries to give you the best.

They have a great team of skilled mentors who are always ready to direct their trainees in the best possible way they can and to ensure the skills of mentors we held many skill development programs as well so that each and every mentor can develop their own skills with the demands of the companies so that they can prepare a complete packaged trainee.

Services provided by Compsoft Technologies.

• Core Java and Advanced Java

• Web services and development

• Dot Net Framework

• Python

• Selenium Testing

• Conference / Event Management Service

• Academic Project Guidance

• On The Job Training

• Software Training

Chapter -3

INTRODUCTION

INTRODUCTION TO M.L

Arthur Samuel, an early American leader in the field of computer gaming and artificial intelligence, coined the term “Machine Learning ” in 1959 while at IBM. He defined machine learning as “the field of study that gives computers the ability to learn without being explicitly programmed”. Machine learning is programming computers to optimize a performance criterion using example data or past experience . We have a model defined up to some parameters, and learning is the execution of a computer program to optimize the parameters of the model using the training data or past experience. The model may be predictive to make prediction .The field of study known as machine learning is concerned with the question of how to construct computer programs that automatically improve with experience.

Problem Statement

A computer program is said to learn from experience E with respect to some class of tasks T and performance measure P , if its performance at tasks T, as measured by P , improves with experience E.

The present technology has lots of advantages and Artificial Intelligence has made life simpler to lots of people . At this rate of technology Improvement , It is highly difficult for the blind people to learn the technology and learn about it. To Cop up with the technology and communicate ,there is a need for a assistance for them .

Using the Machine learning technology , The visually challenged people’s life is been made simpler like normal people.We have developed a Android app which helps them to communicate with others and also to Google using Voice Recognition Feature .

Through this , they can also recognize the value of the currency and also battery status , Add people to their contacts.

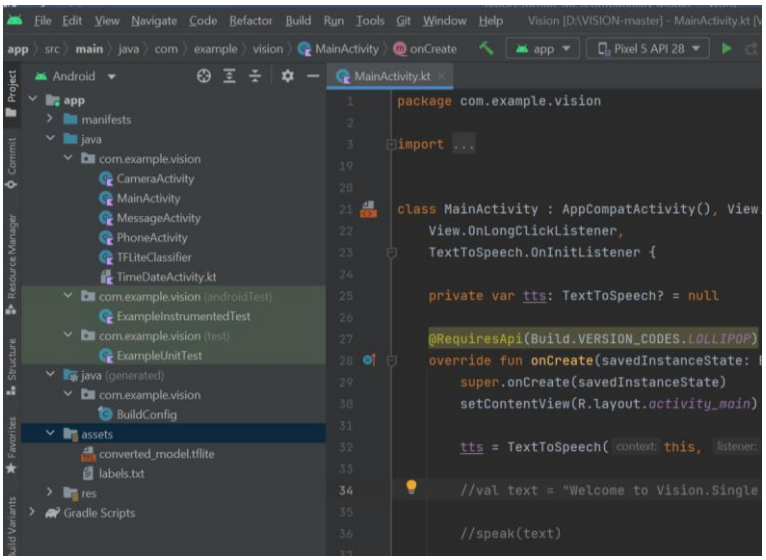
CHAPTER 4

SYSTEM ANALYSIS

1. EXISTING SYSTEM

A good understanding of the problem statement at hand can lead to understanding the data associated with it. In addition, it can set a layout for the series of stages that are to be planned to reach the optimum solution.

The proposed system implements a voice assistant app for visually impaired people to assist them in basic activities like calling, messaging, date/time accessibility and to recognize Indian currency denominations with ease and accuracy.



Android Studio of the Source code

2. PROPOSED SYSTEM

The proposed system implements a voice assistant app for visually impaired people to assist them in basic activities like calling, messaging, date/time accessibility and to recognize Indian currency denominations with ease and accuracy.

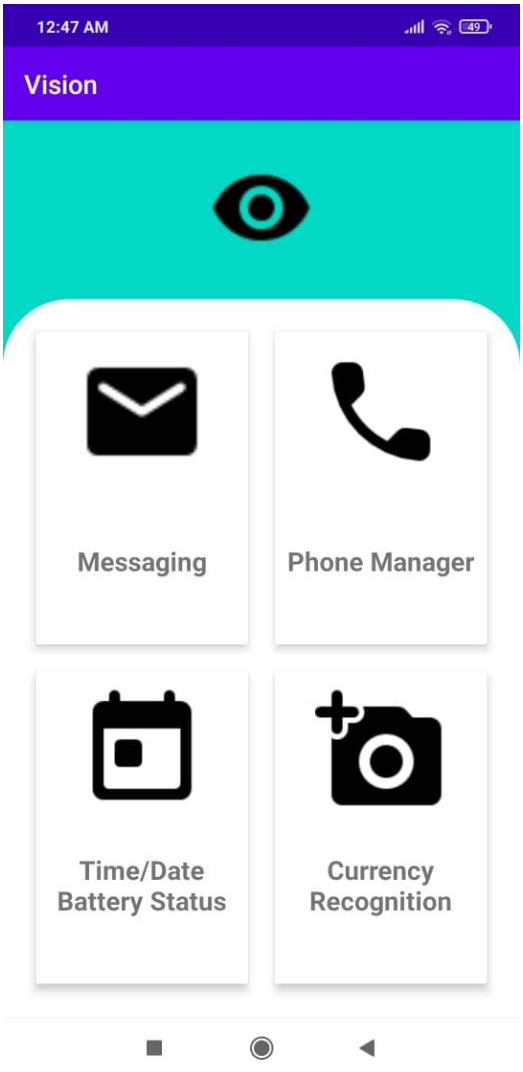
It is to build a customized application which acts as a voice assistant and can be used to help the visually impaired to access the most important features of their mobile phones. The app consists of four modules. These are:

1)Messaging Inbox – In this module the system will speak the new messages for the user and the user can also send messages through Speech Recognition API and text-to-speech API.

2)Phone Manager – In this module the user can either use the provided dialer or can speak recipient's phone number to make a call.

3)Time/Date and Battery Status – In this module the user can get the phone's current battery status and also know date and time.

4)Camera – This module will be used to identify Indian currency denomination and predict the notes scanned by the camera.



Existing System using M.L

3 . OBJECTIVE OF THE SYSTEM

Our project covers visually impaired or blind people as a scope of the project. Recently, there has been a lot of interest in blind assisting technology, like speech recognition for people with disabilities, all over the world. Because of the expected increase in the proportion of the population with a visual disability, particularly in low and middle-income countries like India, the need for and demand for such technologies will grow over time. Several systems have been developed to assist visually impaired people and improve their quality of life. Unfortunately, the majority of these systems have limited capabilities. Website assistance via speech recognition is one such technological approach that can benefit blind individuals to access the information available on the website and help them to navigate over the website.

Our project covers visually impaired or blind people as a scope of the project. Recently, there has been a lot of interest in blind assisting technology, like speech recognition for people with disabilities, all over the world. Because of the expected increase in the proportion of the population with a visual disability, particularly in low and middle-income countries like India, the need for and demand for such technologies will grow over time. Several systems have been developed to assist visually impaired people and improve their quality of life. Unfortunately, the majority of these systems have limited capabilities. Website assistance via speech recognition is one such technological approach that can benefit blind individuals to access the information available on the website and help them to navigate over the website.

On the other hand, the project will also help the government as information now can easily be transferred to the visually impaired people who were not considered much before. Government can now directly provide the information about the schemes, their implementation and pass all the necessary information to the visually impaired, which will, in turn, help the visually impaired people know better about government policies and how they can be helped.

CHAPTER 5
REQUIREMENT ANALYSIS

5. REQUIREMENT ANALYSIS

Hardware Requirement Specification

- ✓ 64 bit version of Windows(8,9 or 10)
- ✓ 2nd generation Intel core
- ✓ 8 GB RAM
- ✓ 8GB of available disk space
- ✓ 64 bit Linux distribution
- ✓ Intel i5 or higher
- ✓ 30 GB SSD

Software Requirement Specification

- ✓ Python
- ✓ Tensorflow Lite
- ✓ HTML
- ✓ XML
- ✓ Java
- ✓ Operating System Windows7/WindowsXP/LINUX
- ✓ Python package

CHAPTER 6
DESIGN ANALYSIS

6 . DESIGN & ANALYSIS

When you're working with machine learning, the traditional functions of design — crafting a product vision and communicating with stakeholders — apply, but ML also brings new factors to the table. This article explores how design techniques can be applied in ML development At base, it's all about data — getting it (a lot of it!), cleaning it, understanding it, and ultimately building software on top of it. The process goes something like this:

1. Collecting data
2. Visualizing and cleaning that data
3. Creating models and algorithms
4. Evaluating those models and algorithms

1. Collecting Data

```
Model: "sequential"
_________________________________________________________________
Layer (type)                 Output Shape              Param #
=================================================================
conv2d (Conv2D)              (None, 254, 254, 32)      896
_________________________________________________________________
max_pooling2d (MaxPooling2D) (None, 127, 127, 32)      0
_________________________________________________________________
conv2d_1 (Conv2D)            (None, 125, 125, 32)      9248
_________________________________________________________________
max_pooling2d_1 (MaxPooling2 (None, 62, 62, 32)        0
_________________________________________________________________
conv2d_2 (Conv2D)            (None, 60, 60, 32)        9248
_________________________________________________________________
max_pooling2d_2 (MaxPooling2 (None, 30, 30, 32)        0
_________________________________________________________________
flatten (Flatten)            (None, 28800)             0
_________________________________________________________________
dense (Dense)                (None, 512)               14746112
_________________________________________________________________
dense_1 (Dense)              (None, 10)                5130
=================================================================
Total params: 14,770,634
Trainable params: 14,770,634
```

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2	JPG File	277 KB	No	280 KB	1%	22-05-2014 01:10 PM
3	JPG File	350 KB	No	352 KB	1%	22-05-2014 01:10 PM
4	JPG File	423 KB	No	424 KB	1%	22-05-2014 01:10 PM
5	JPG File	244 KB	No	247 KB	2%	22-05-2014 01:10 PM
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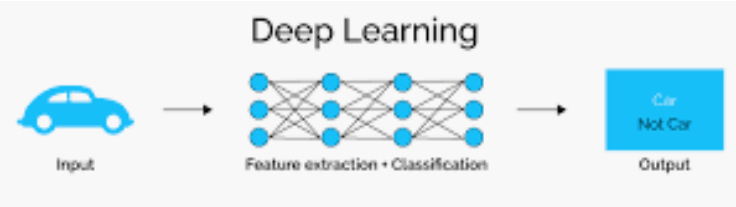
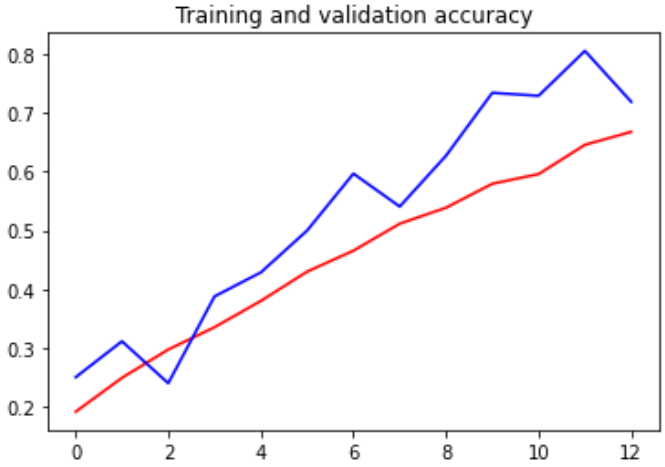
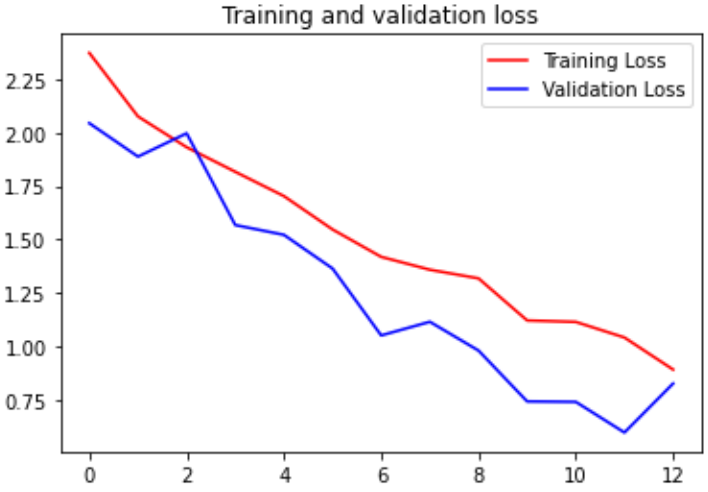
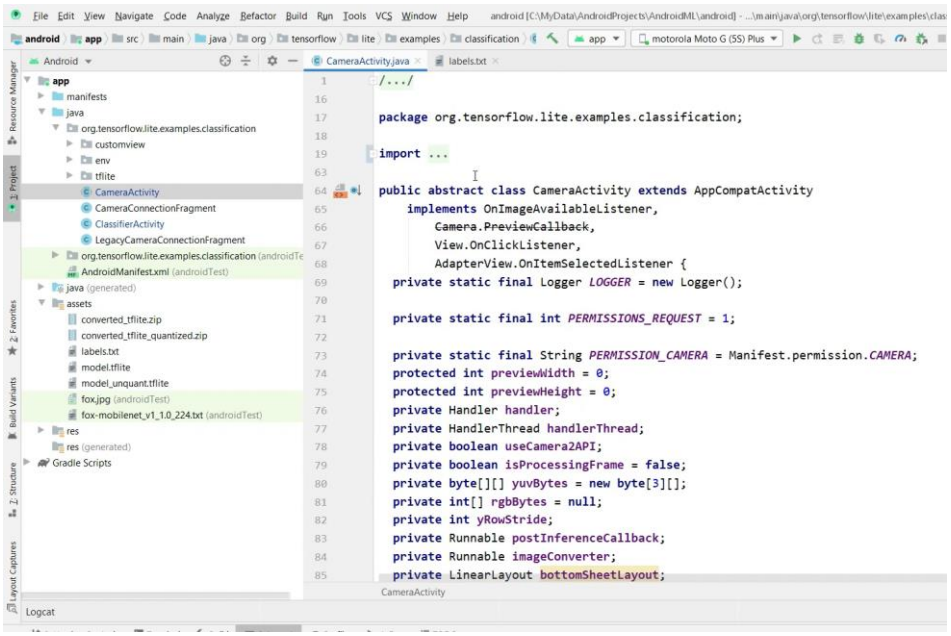
2. Visualizing the model



Training & Analysis of The model



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app
motorola Moto G (5S) Plus
Android
CameraActivity.java
labels.txt
app
manifests
java
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customview
env
tflite
CameraActivity
CameraConnectionFragment
ClassifierActivity
LegacyCameraConnectionFragment
org.tensorflow.lite.examples.classification (androidTe
AndroidManifest.xml (androidTest)
java (generated)
assets
converted_tflite.zip
converted_tflite_quantized.zip
labels.txt
model.tflite
model_unquant.tflite
fox.jpg (androidTest)
fox-mobilenet_v1_1.0_224.txt (androidTest)
res
res (generated)
Gradle Scripts
/.../
package org.tensorflow.lite.examples.classification;
import ...
public abstract class CameraActivity extends AppCompatActivity
implements OnImageAvailableListener,
Camera.PreviewCallback,
View.OnClickListener,
AdapterView.OnItemSelectedListener {
private static final Logger LOGGER = new Logger();
private static final int PERMISSIONS_REQUEST = 1;
private static final String PERMISSION_CAMERA = Manifest.permission.CAMERA;
protected int previewWidth = 0;
protected int previewHeight = 0;
private Handler handler;
private HandlerThread handlerThread;
private boolean useCamera2API;
private boolean isProcessingFrame = false;
private byte[][] yuvBytes = new byte[3][];
private int[] rgbBytes = null;
private int yRowStride;
private Runnable postInferenceCallback;
private Runnable imageConverter;
private LinearLayout bottomSheetLayout;
CameraActivity
Logcat

CHAPTER 7
IMPLEMENTATION

Implementation is the stage where the theoretical design is turned into a working system. Themost crucial stage in achieving a new successful system and in giving confidence on the newsystem for the users that it will work efficiently and effectively.

The system can be implemented only after thorough testing is done and if it is found to workaccording to the specification. It involves careful planning, investigation of the current system and it constraints on implementation, design of methods to achieve the change over and an evaluation of change over methods a part from planning.

Two major tasks of preparing the implementation are education and training of the users and testing of the system. The more complex the system being implemented, the more involved will be the system analysis and design effort required just for implementation.

The implementation phase comprises of several activities. The required hardware and software acquisition is carried out. The system may require some software to be developed. For this, programs are written and tested. The user then changes over to his new fully tested system and the old system is discontinued.

The android application is made using Kotlin programming language. Kotlin is a modern statically typed programming language that helps boost productivity, developer satisfaction, and code safety. Some of its features are – Expressive and concise, safer code, interoperable, and structured concurrency. The built in speech-to-text and text-to-speech APIs are used for voice assistant functionality. The speech-to-text API is an intent based API, which launches Google's Speech Recognition service, and returns back the text result. The text-to-speech API, unlike Speech Recognition, is available without Google Services, and can be found in android.speech.tts package.

Implicit intents are used to make a phone call after receiving the recipient's phone number. The ACTION_CALL action is used to trigger built-in phone call functionality available in Android devices. Implicit intents send the user to another app or service based on an action the user would like to perform. For example, here we have a phone number and we want to make a call. For this instead of building our own activity, we create a request to make the phone call using Implicit Intent.

Next we have features such as sending and receiving messages and getting the current

battery status and battery percentage. These functionalities are implemented using broadcast receivers. Apps can register specific broadcasts. When a broadcast is sent, the system automatically routes broadcasts to apps that have subscribed to receive that particular type of broadcast. The BatteryManager class is used to broadcast all battery and charging details and the onReceive() method of the BroadcasrReceiver class is used to receive messages.

The currency detection model uses Deep Learning techniques to recognize any Indian Currency using image as an input feed. Deep Learning is a machine learning technique that teaches computer to do what comes naturally to humans. A computer model learns to perform classification tasks directly from images, text or sound.

The image detection is done through a Convolutional Neural Network model built using Tensorflow and Keras Library of python.

TESTING

The testing phase is an important part of software development. It is the Information zed system will help in automate process of finding errors and missing operations and also a complete verification to determine whether the objectives are met and the user requirements are satisfied. Software testing is carried out in three steps:

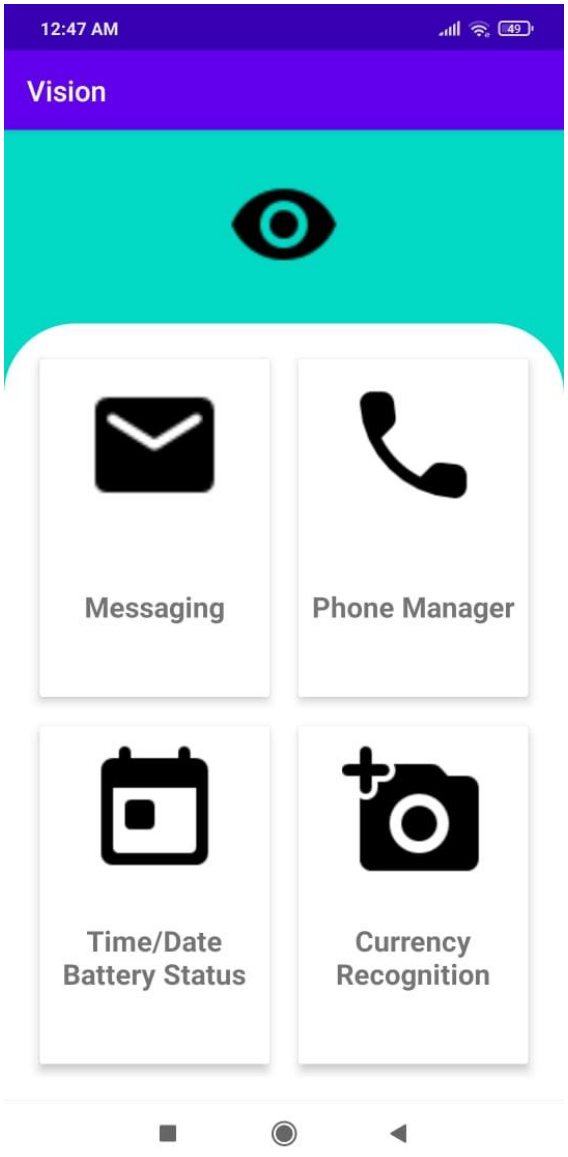
1. The first includes unit testing, where in each module is tested to provide its correctness, validity and also determine any missing operations and to verify whether the objectives have been met. Errors are noted down and corrected immediately.

2. Unit testing is the important and major part of the project. So errors are rectified easily in particular module and program clarity is increased. In this project entire system is divided into several modules and is developed individually. So unit testing is conducted to individual modules.

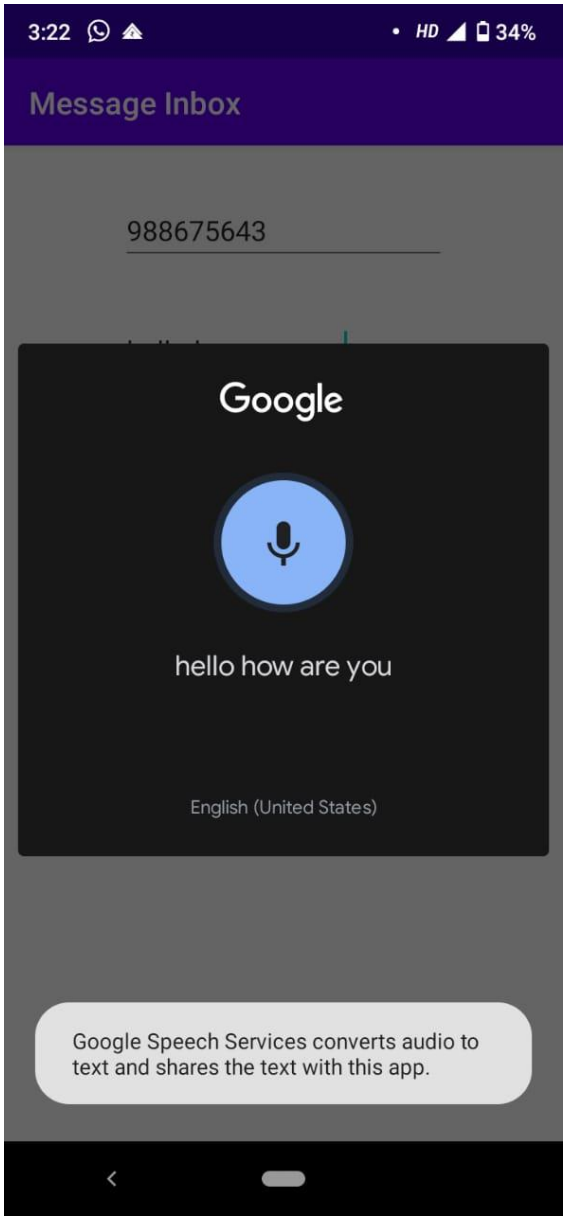
3. The second step includes Integration testing. It need not be the case, the software whose modules when run individually and showing perfect results, will also show perfect results when run as a whole.

CHAPTER-8
SNAPSHOTS

Home Page of Android app



Phone Manager & Message Inbox



Currency Recognition & Batter Status

CHAPTER-9
CONCLUSION

The package was designed in such a way that future modifications can be done easily. The following conclusions can be deduced from the development of the project:

- Automation of the entire system improves the efficiency
- It provides a friendly graphical user interface which proves to be better when compared to the existing system.
- It gives appropriate access to the authorized users depending on their permissions.
- It effectively overcomes the delay in communications.
- Updating of information becomes so easier
- System security, data security and reliability are the striking features.
- The System has adequate scope for modification in future if it is necessary.
- This system will be very easy to use and will run on the Android operating system. The voice recognition API and text-to-speech (TTS) makes it very easy for users to navigate around different functionalities of the app. The application with its deep learning based technique to recognize and classify Indian currencies provides a reasonable accuracy and will help visually impaired people to be able to improve their quality of life by reducing their dependency and aiding them in their day to day life.

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