

INVENTION OF THIRD VISION FOR SAFEGUARDING WOMEN WITH A LIVE SURROUNDING UPDATE

Submitted in partial fulfillment of the requirement for the award of
Bachelor of Engineering Degree in Electronics and Instrumentation
Engineering

By

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**DEPARTMENT OF ELECTRONICS AND INSTRUMENTATION ENGINEERING
SCHOOL OF ELECTRICAL AND ELECTRONICS ENGINEERING**

SATHYABAMA

**INSTITUTE OF SCIENCE AND TECHNOLOGY
(DEEMED TO BE UNIVERSITY)**

**Accredited with grade "A" by NAAC | 12B status by UGC | Approved by AICTE
JEPPIAAR NAGAR, RAJIV GANDHI SALAI, CHENNAI -600119**

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BONAFIDE CERTIFICATE

This is to certify that this Project Report is the bonafide work of **SRIRAM J.A(Reg. No. 37180018)** and **DHANUSH P.E (Reg. No. 37180701)** who carried out the project entitled “**INVENTION OF THIRD VISION FOR SAFEGUARDING WOMEN WITH A LIVE SURROUNDING UPDATE**” under my supervision from NOVEMBER 2020 to APRIL 2021.

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To whom it may concern

This is to certify that, Sriram J A, a student of Sathyabama Institute of Science and Technology pursuing his Final year in Electronics and Instrumentation department has undergone an internship for a period of 01-12-2020 to 03-03-2021 in our company and completed a project called "Third Vision for Women Safety". During the internship period, the student was found to be interested towards his work.

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Declaration

We **SRIRAM J.A. (Reg.No.37180018)** and **DHANUSH P.E. (37180701)** hereby declare that the Project Report entitled **“INVENTION OF THIRD VISION FOR SAFEGUARDING WOMEN WITH A LIVE SURROUNDING UPDATE”** done by us under the guidance of **Mr. BESTLEY JOE S, M.E., (Ph.D)** and **YadavaPrasath G, B.E., Founder and CEO** at **SIEORA – INDUSTRIAL DIVISION, Chennai-600115, Tamil Nadu** is submitted in partial fulfilment of the requirements for the award of Bachelor of Engineering degree in **ELECTRONICS AND INSTRUMENTATION ENGINEERING**.

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ABSTRACT

Women safety is becoming the foremost thing for every country. Today women are harassed and troubled and sometimes when the urgent help is needed, there is no required information of the women so that people can help, everybody is in having and aware of safety of women, it must be checked and protected properly. Already proposed system will take action only after the incident happen. In this project we will be using the women's handbag in which we will be fixing our hardware module with a raspberry pi integrated with web camera lenses along with a small mic which can be carried anywhere they go. Whenever she meets any outsider, the activities of the person can be monitored continuously. If the activities of the person vary resulting in any harmful action, or any abnormal voice then our system will detect it and process the information and will it will be notified to the parent mobile thorough push notification including the location. A parent mobile application will be developed using react native to receive notification, also to monitor the condition live and help the victim as soon as possible. A women mobile application is developed to send the current location of the women to the parent application by passing the location through MQTT. Hence, this system reduces the risk and crimes happening against the women safety.

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LIST OF SYMBOLS AND ABBREVIATIONS

CNN	Convolutional Neural Network
RNNS	Recurrent Neural Network
ILSVRC	ImageNet Large Scale Visual Recognition Challenge
ReLU	Rectified Linear Unit
SARSA	State-Action-Reward-State-Action
DDPG	Deep Deterministic Policy Gradient

CHAPTER -1

INTRODUCTION

1.1 GENERAL

During last few years, Women safety has seen a down spike because of several terrible and brutal incidents happened to them. In this modern world, everything is improving except the status of women; their condition is down when compared to the medieval period. Women have given half the extended development of the country India and also they share half the population of the country which means they have the same rights as men have.

Women of India are also started sitting in heavy and high places like The President, Ministers, Opposition Ministers, Lok Sabha Speakers and many other powerful places. As indicated by the Constitution of India, they have equivalent privileges of pride, balance, and independence from sexual orientation separation. Right from sexual harassment, acid attacks, rapes, dowry deaths and many more, women facing a number of problems.

Education and Economic Development

Even in this modern world, the female literacy is low than the male literacy. Metropolitan young ladies are almost equivalent in instruction like young men anyway in the country zones there is as yet a major hole. States like Mizoram and Kerala have faced a universal literacy rate for women. In this way, women in such states have high friendly and monetary status.. Due to inadequate school facilities, proper sanitary knowledge and its facilities, gender discrimination the female literacy rate is still low in India. As indicated by the measurements of 2015, Even though the male proficiency rate is 81.3% it is found that the female education rate is 60.6

1.2 TECHNOLOGY USED

1.2.1 Deep learning

Deep learning is a subset of machine learning. It is created on the basis of working of a human brain.

Deep learning is designed with connected layers.

- The 1st layer is i/p LAYER
- The ending one is o/p LAYER
- Other layer between i/p and o/p layers are called as HIDDEN LAYER. The DEEP is termed as that the neuron is connected to more than two.

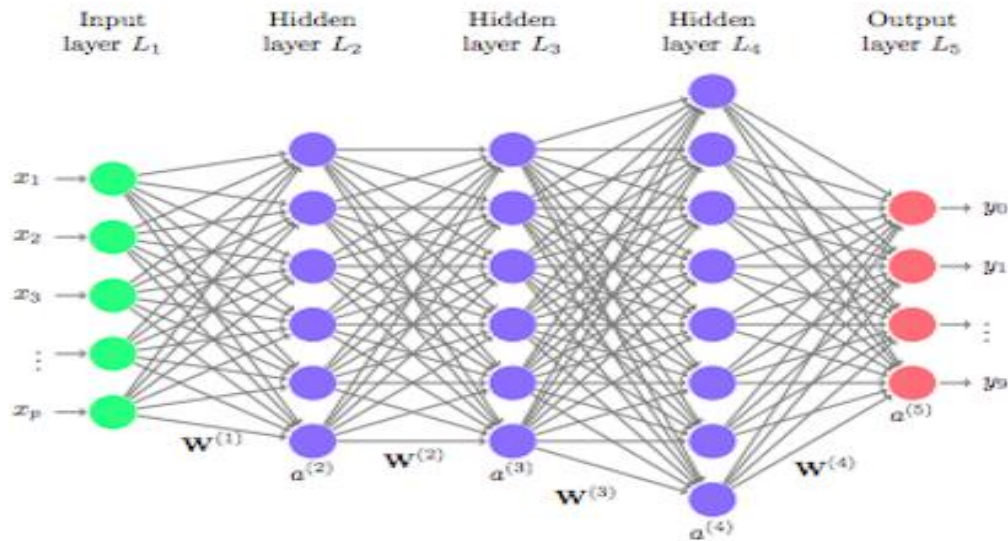


Figure 1.1 Deep Learning Layers

Neurons play the major role here, as every single layer consists of neurons. Each neuron connects with another neuron. The neuron above will send the signal and it will process the received signal. The strength of the signal received will be determined by the bias, weight, and the function

Neurons learn early and in a faster manner including the complex features of each layer. Except, it consumes large input to process and to operate them by multiple layers. Deep learning is mainly and widely used as a powerful tool in the prediction process and taking preferable decisions to meet the result. The fuel of deep learning is Big Data. An organization can see a sudden spike in its growth if it uses this by both combined. Right from sales, management, etc.

The old method can be eclipsed by this Deep learning. 25% accuracy in voice recognition and 27% more accuracy in facial recognition by the Deep Learning process. In addition, it has given a massive 41% accurate result in the process of image recognition.

1.2.1.1 Deep Learning Process

Deep learning has shown an extraordinary performance in processes like speech recognition and many others. The main advantage of this deep learning is it can automatically learn things without the help of a previous process that was done by programmers.

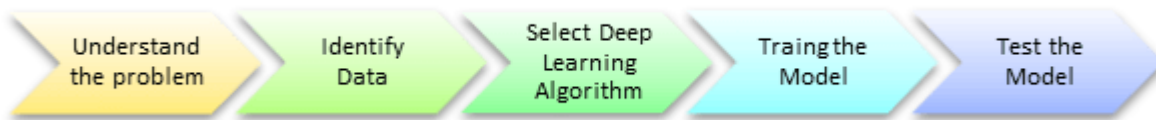


Figure 1.2 Deep Learning Process

The above picture shows a system that is capable of learning complex structure than the other system in large number.

It is done in two process.

- To create a system that is by applying a transformation, this is initial and first one.
- Then it is to be improved by mathematical says and this is the second one.

The neural network will keep on repeats those two phases from 100 to 1000 times until the acceptable tolerance reaches. It is called as the iteration.

1.2.1.2 Classification of Neural Networks

Shallow neural network: It has one hidden layer only .

Deep neural network: For example, 22 layers counts has been done by the google net model. So deep neural network should have more than two layers.

Nowadays Deep learning can be seen everywhere right from search engines, TV's and even in automobiles.

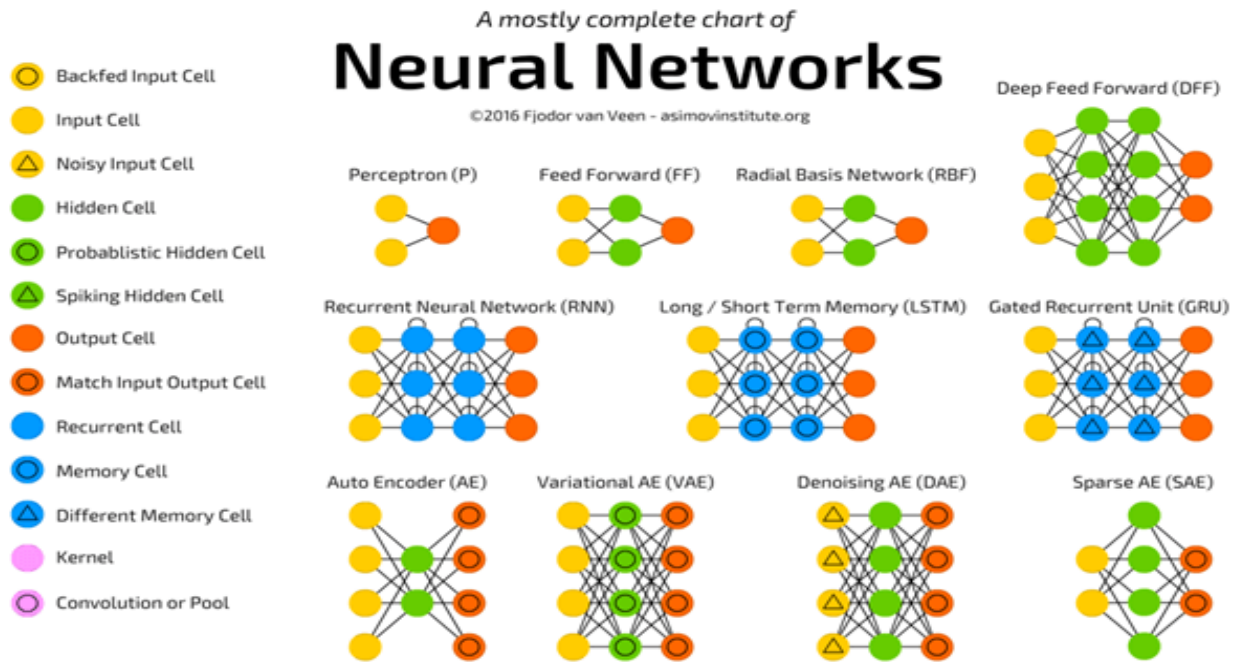


Figure 1.3 Types of Deep Learning Networks

Feed-Forward Neural Networks

FNN is the easiest of ANN. This network will not have any loops. Due to this the information sent from a neuron send will be stopped in the next neuron's o/p layer. The information initially sends from the input and then it is proceeded to the hidden and at last it reaches the output layer.

Recurrent neural networks (RNNs)

RNN exactly sits for the process input processing. Because RNN is a neural network that is capable of learning things automatically by its sequence of data. It is a connecting Artificial Neural Network between every neurons.

The process of RNNs is explained below:

- It will receive signal as a start sentence.
- The network will proceed to next.
- The network will give a probability for every single word it received for completing the sentence. Then the final stage will happen when it receives a word "a".

Common uses of RNN

- Analytic reports can be taken, which is helpful for security traders.
- Unwanted things in financial statement can be neglected by detecting.
- Credit card transaction frauds can be found and actions can be taken.
- Image captions can be given.

1.2.1.3 Convolutional Neural Networks (CNN)

CNN is a neural network with a capabilities of multilayers and also an extraordinary engineering intended to delete complex pinnacle of the information at each layer to validate and predict the yield. Perceptual tasks can be done using this CNN.

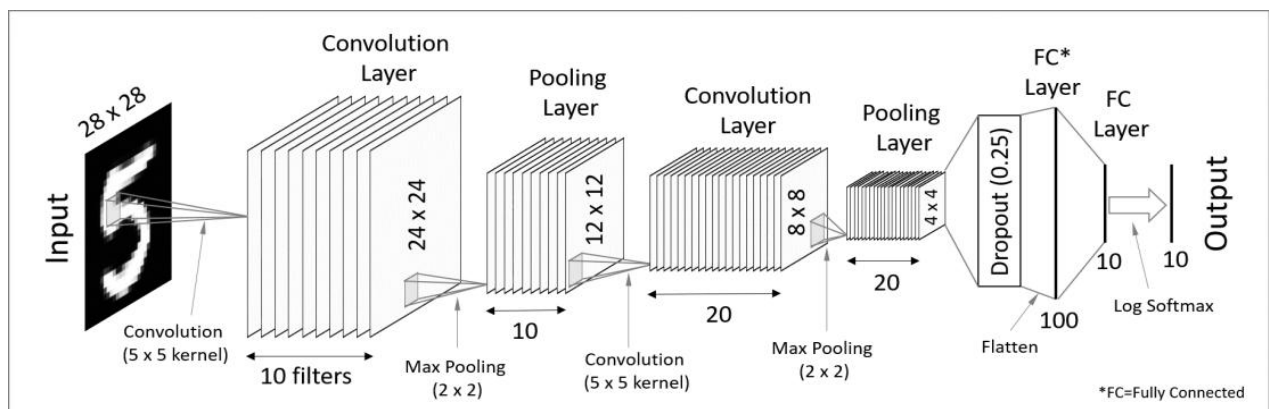


Figure 1.4 CNN

If any user need to find an information from an unknown an undefined data then he can use this CNN to get it.

For example, the given work is to get cation of an image

- Take a picture of a cat and he need caption, the computer gives him a three layer for a colored one and it will consider only one layer for black and white one. Because for computers there are collection of data that has a collective pixel in it.
- If the computer network becomes a pro in it will start giving and predicting the score for the picture by recognizing the picture thoroughly. And it will allot the highest probability score from the score predicted.

A CNN is an expert one in recognizing visual pattern straight from pixels of the images. It is a special kind of multi-layer networks. The ImageNet is large visual database project designed for software research. Every year it conducts software contest where many software compete each other in identifying the objects and scenes.

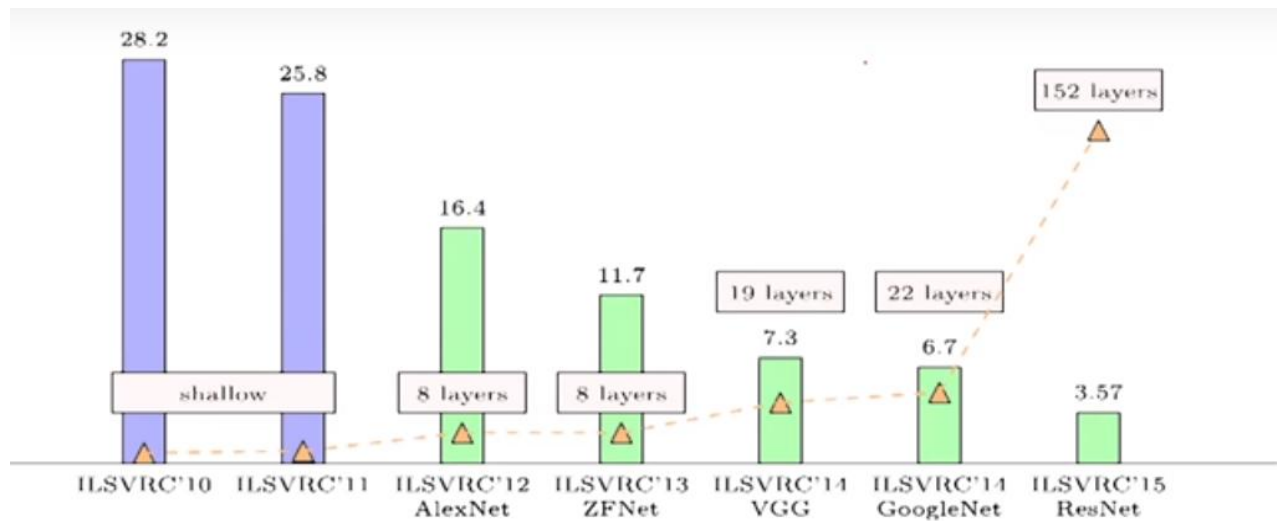


Figure 1.5 Types of CNN

1.2.2 React native app development:

Cross-platform development is a neat replacement for developing a app that is fully native. It can be used for developing both iOS and android supporting by this culture of native development. It allows you to cut, and use same code across both developments by reducing the time. React Native is going to be the time ahead for this Cross- Platform due to the rise of spike in the usage of react native in the recent time.

React Native has a plus point of creating a app in faster way and even less expensive. JavaScript alone can be known and used to create an application using this React native. Its main distinctive is that, it functions like native apps.

Community matters

It is an open-source. It tells that the available documents and codes related to this are open to each and every one and its free everyone who are in the community. By this it shows, various advantage by using the driven Tech. You can get help from the same community, For instance if you face a issue in the development or you lack in some point. Anyone can give some hand in it or you can ask anybody from the community expert to find the solution.

Reusable code & pre-built components

Since most of the codes available there can be re-utilized for creating an app that is for iOS and android. This gives the react native a major advantage.

Simplified UI

Since it accepts JavaScript, the react native almost look like a library of JavaScript when compared to other works like meteor JS and so on.

Another plus point of React Native is, while building an app, it is important to create a sequence in order of proper working of the app. The react native does this job perfectly and fits in it. It gives a smoother feel because, react native is more and more responsive and accurate and lowers the load time.

Third-party plug-in support

It is keep on improving itself and see some major advancement, because of it it might lose some components of the framework. To overcome this, React Native gives two plug-ins. 1) Native Modules and 2) JavaScript Modules.

1.3 OBJECTIVE:

- The objective of the project is to safeguard the women using the activities of the opposite person while communication.
- TO design a system that is capable of recognizing the human activities by using the image processing and Deep Learning. Our system should be intelligent like that.
- To design a mobile application for the women that sends her location to another parent mobile application when in danger.
- To design a parent mobile application for the purpose of live streaming.

CHAPTER -2

LITERATURE SURVEY

2.1 INTRODUCTION

The following shows survey on women safety. The most popular of the existing techniques used for emotion prediction.

2.2 LITERATURE SURVEY

2.2.1 Facial Expression Recognition with Deeply-Supervised Attention Network, Yingruo Fan*, Victor O.K. Li, Fellow, IEEE, and Jacqueline C.K. Lam*, Member, IEEE Department of Electrical and Electronic Engineering The University of Hong Kong, Hong Kong, China [2020, Vol No: 1949-2045]

In this work, Deeply Supervised Attention Network is established to recognise the human facial emotion irrespective of the other qualities like the, race, gender, age and so on. This system worked well in the classification of the human facial expression and it stopped with that. No step is taken next to that. A 2 stage network is created to identify the data from the pixel's lightweight layer to the deep layer.

Pros:

The system effectively incorporates the various human facial emotions and expression for performing various emotion recognition tasks.

Cons:

The limits while tending to facial expression distinction because of demographic variety.

2.2.2 Speech Emotion Recognition Based on Robust Discriminative Sparse Regression, Peng Song, WenmingZheng, Senior Member, IEEE , Yanwei Yu, ShifengOu [2020, Vol No : 2379-8920]

In this work, they have concentrated in classifying the emotion with the help speech recognition. It is believed that emotion is also expressed in the form of speech and voice. As Vocal and speech emotion recognition is seen rise in spike, they have created an algorithm which removes the background noise and concentrate on the main elements of the voice supplies. And it is said that the system worked well, as a proof they have also tested on public voices which showed good response.

Pros:

As they have tested the system on the public voice and it showed a good result. It shows the efficiency of the system to recognise the emotion using the speech.

Cons:

Follows the traditional method of extracting the features and recognition of emotion, which is stated as issue.

2.2.3 Context Based Emotion Recognition using EMOTIC Dataset, RonakKosti, Jose M. Alvarez, AdriaRecasens, AgataLapedriza [2019,Vol No: 0162-8828]

In this work, they have tried to create a work system that is capable of recognising the emotion and feeling by using the context of the situation that is present in the place. For that they have created a database and named it as EMOTIC, it is nothing other than that is, a group of picture of a person with his normal and other annotated pictures for the recognition. By this they integrated it and classified the emotion using the background and situation context.

Pros:

By this they showed that the situation also contributes in identifying the emotion of a person.

Cons:

The major drawback is its accuracy which is very low.

2.2.4 Reliable Crowdsourcing and Deep Locality-Preserving Learning for Unconstrained Facial Expression Recognition, Shan Li, and Weihong Deng*, Member, IEEE [2018, Vol No: 1057-7149].

In this work, they tried to create a system that is capable of classify and find the human emotion with help of a Data based named RAFDB. It contained more than 30000+ images of various persons at various emotions, illumination, poses and different qualities. With the help of 40 annotators, they labelled each images and trained a already prevailing Deep Algorithm and succeeded in it.

Pros:

The database used here can be freely available and anyone can be used as it is a open source including the benchmarks.

Cons:

It cannot differentiate much images taken at a single event.

2.2.5 Real-Time Movie-Induced Discrete Emotion Recognition from EEG Signals, Yong-Jin Liu, Senior Member, IEEE, Minjing Yu, Guozhen Zhao, Jinjing Song, Yan Ge, and Yuanchun Shi, Senior Member, IEEE [2017,Vol No: 1949-3045].

In this work, they tried to classify the human emotion with the help of some movie clips they collected from thousands of film making experts. From this, they created 16 movie clips which consists of the major 7 emotional categories. They took result from 30 participant's brain signals (EEG-signal). It showed 92 % positive result in the positive emotion recognition and 86% in negative recognition. They made this, making the participants to watch these 16 clips and received the EEG which had different strength according to the emotion.

Pros:

The system showed a major advantage in real-time application process as it received the signals from the brain to classify the human emotion.

Cons:

The accuracy of the system is very low when compared to other methods.

2.2.6 ISLA: Temporal Segmentation and Labeling for Audio-Visual Emotion Recognition, Yelin Kim, Member, IEEE, and Emily Mower Provost, Member, IEEE [2017, Vol No: 1949-3045].

Developing a system to recognise human emotion by using the affective computing and human centred technology much difficult as emotions are more complex and different to recognise. So they created this ISLA where they showed how the upper and lower part of the face helps in identifying the emotion. They incorporated the signals received from the upper and lower part of the face when emotion changes to the speech recognition system.

Pros:

It showed a good result in the process when compared to the other.

Cons:

This system is also finds difficult to find the emotion.

2.2.7 Heterogeneous Acceleration of HAR Applications Jose Rodriguez Borbon, Student Member, IEEE, Xiaoyin Ma, Member, IEEE, Amit K. Roy-Chowdhury, Senior Member, IEEE, and WalidNajjar, Fellow, IEEE [2018,Vol No: 1051-8215].

The already prevailing process for producing the human action that is the HAR does not support for a video that lasting for only few seconds. For this, they created a

heterogeneous system that divide the process into four and process it in the CPU, FBG and GPU in it. By this process it showed a 1.3X faster result and when compared to other and also showed a 1.5X more efficient than the other.

Pros:

As it uses fixed-point algorithm, it showed more accuracy than the other system using the single-point algorithm.

Cons:

Real-time application is not suitable.

2.2.8 Cross-corpus Acoustic Emotion Recognition with Multi-task Learning: Seeking Common Ground while Preserving Differences, Biqiao Zhang, Student Member, IEEE, Emily Mower Provost, Member, IEEE, and Georg Essl, Member, IEEE, [2016, Vol .No: 1949-3045].

Factors like languages, lexical, noise level, background made systems to find it difficult to predict the human emotions. So in this work, they tried to integrate the cross-corpus to overcome these difficulties. They tried to predict by the output received by these domain, corpus, and gender. And found that all these co-operates in predicting the output of facial emotion and speech emotion.

Pros:

Good accuracy is received.

Cons:

Real time application is not possible.

2.2.9 Measurement and Analysis of Local Pulse Transit Time for Emotion Recognition, N. Beckmann, R. Viga, A. Dogangün, and A. Grabmaier [2019, Vol. 19, No. 17].

Emotion recognition is basically differentiated in to two types. 1. Stationary and 2. Non-stationary. The data received by a non-stationary wireless system can produce more errors and for overcoming this, the authors created an algorithm that is capable of handling the psychological emotions and effects. By this they also conducted a test and received go statistical result between induced emotional statuses. And they said that it can be used for further advancement of real time emotion recognition process.

Pros:

As the system can be installed in a wearable device, a real time application is possible.

Cons:

Stationary and non-stationary systems cannot be distinguished.

2.2.10 Toward User-Independent Emotion Recognition using Physiological Signals, AmaniAlbraikan, Diana P. Tob'on, and Abdulmotaleb El Saddik [2018, Vol. No: 1558-1748].

No: 1558-1748].

In this work, they created a hybrid Meta learning process making WMD (weighted multimedia dimension). By using this they tried to classify the human emotion as a base model and also they achieved an accuracy of 65% for all E4 method users and less than or equal 94% in other emotion recognition.

Pros:

Accuracy is good and more reliable system.

Cons:

Multi-tasking is not possible like other methods available.

2.2.11 Internal Emotion Classification Using EEG Signal with Sparse Discriminative Ensemble. Habib Ullah1, Muhammad Uzair2, Arif Mahmood3, Mohib Ullah4, Sultan Daud Khan5, FaouziAlayaCheikh6[2018, Vol. No: 2169-3536]

Since EEG signals provides more vital information in the emotion classification when compared to other methods like EMG, ECG and many others. So the authors made a system of EEG by using kernel representation for collecting the training voice recording. As a result the system showed more efficiency and less time consuming one when compared to others. To prove this they tried by using publicly available voices.

Pros:

They showed the system by using publicly available methods and it showed its efficiency.

Cons:

Real-time is recommended as the system seems to be non-reliable.

2.3 DISADVANTAGES IN EXISTING SYSTEM

- The existing system has focused on only differentiating the type of emotions.

- It has effectively integrated demographic information in improving the performance of a variety of FER tasks but only learn informative feature representations with a visual explanation by capturing the regions of interests (ROI)
- Just types of emotions are classified and recognized.
- There are no steps taken based on the data received.

CHAPTER - 3

SYSTEM ANALYSIS

3.1 EXISTING SYSTEM:

Facial expression recognition is tough for social communication. But it has difficulties in describing facial expression the facial variation like, gender, age, race and etc. In this, we will create a Deeply Supervised Attention Network to identify human facial expression automatically. Using that, a 2 stage network is created for taking the major points of those facial variations like gender, age race etc. In this deeply supervised Attention Network, the multi-scale are restricted to catch high discriminative data from profound layer to shallow layer. Further, we stand out enough to be noticed square to result the fundamental nearby facial qualities; it results in more accurate and better performance when it is integrated with the Deeply Supervised Attention Network. At last it is to be combined with the characteristics of multiple convolution layer of DSAN manner to predict score

3.2 DISADVANTAGES OF EXISTING SYSTEM:

- The existing system has focused on only differentiating the type of emotions.
- Just types of emotions are classified and recognized.
- There are no steps taken based on the data received.

3.3 PROPOSED SYSTEM:

Women safety is becoming the foremost thing for every country. Today women are harassed and troubled and sometimes when the urgent help is needed, there is no required information of the women so that people can help, everybody is in having and aware of safety of women, it must be checked and protected properly. Already proposed system will take action only after the incident happen. In this project we will be using the women's handbag in which we will be fixing our hardware module with a raspberry pi integrated with web camera lenses along with a small mic which can be carried anywhere they go. Whenever she meets any outsider, the activities of the person can be monitored continuously. If the activities of the person vary resulting in any harmful action, or any abnormal voice then our system will detect it and process the information and will it will be notified to the parent mobile thorough push notification including the location. A parent mobile application will be developed using react native to receive notification, also to monitor the condition live and help the victim as soon as possible. A women mobile application is developed to send the

current location of the women to the parent application by passing the location through MQTT. Hence, this system reduces the risk and crimes happening against the women safety.

3.4 ADVANTAGES:

- Real time facial emotion recognition
- No need of prior steps for the women while leaving alone
- web cameras and sending information of the data to the parents and police
- To derive the present condition.
- Fetching location details and transfer it to parent app.
- Steps can be taken immediately, before anything unwanted happens.

3.5 APPLICATIONS:

- Safe guard women.
- Saves the life of the women earliest.
- Applicable in psychological test.
- Applicable in face emotion.
- A mobile application to view live streaming and get the current location of the person.

CHAPTER 4

SYSTEM DESIGN

DETAILED DESIGN OF THE PROJECT:

This chapter describes the overall and the detailed architectural design. It also describes each module that is to be implemented along with Data Flow diagram.

.4.1 ARCHITECTURE DIAGRAM:

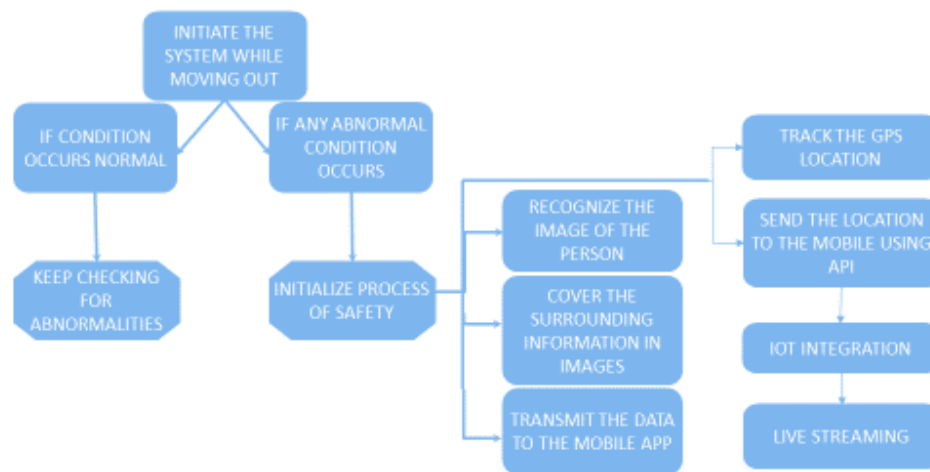


Figure 4.1 System Architecture

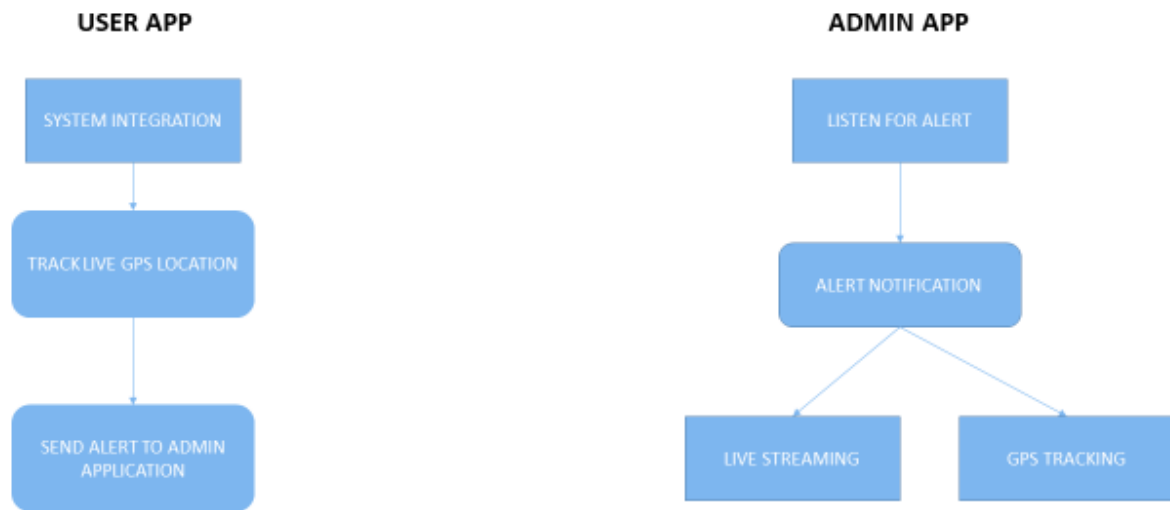


Figure 4.2 Mobile Application Architecture

4.2 WORKING:

In this project we will be using the women's handbag in which we will be fixing our hardware module with a raspberry pi integrated with web camera lenses along with a small mic which can be carried anywhere they go. Whenever she meets any outsider, the activities of the person can be monitored continuously. If the activities of the person vary resulting in any harmful action, or any abnormal voice then our system will detect it and process the information and will it will be notified to the parent mobile thorough push notification including the location. A parent mobile application will be developed using react native to receive notification, also to monitor the condition live and help the victim as soon as possible. A women mobile application is developed to send the current location of the women to the parent application by passing the location through MQTT. Hence, this system reduces the risk and crimes happening against the women safety

4.3 MODULE DESCRIPTION:

- Emotion and vocal dataset Collection
- Emotional VGGNet training
- Audio dataset training
- Mobile App Development
- GPS Integration
- Processing module

- Camera module

4.3.1 Emotion and vocal dataset Collection:

In this project a dataset of both the facial images and audio recordings are taken as a dataset for training.

A data set is a collection of data. Deep learning is evolving as a solution for solving many challenging real-world problems. It has got the name of best performing method for computer vision tasks. With limited and proper training, the deep learning is capable of identifying the key points of a person in an image. The data is the fuel for these Deep learning. It consumes more fuel that is more data to work well and better. The more labelled data available; the better our model performs. Google is having a large scale dataset of 200 million images which give the more data leading to better performance. Data must be continuously fed to the model for improving itself when applying it to the real time application. Data is the most valuable one in this deep learning era. There are 3 steps in collecting these data. They are

Scraping From the Web

We can find and download images which also takes long time because of the human work. This need the task to be finds the common object to be detected. And so that becomes the keyword for web-scraping. It changed the class name for that object.. Every single pixel in the image is required. To get these data, we can also use some annotation tools which are already available Give a raw set of polygon point in an object, it can give the generated pixel labels for the segmentation. Deep extreme cut is also a good alternative but is uses only four extreme point surrounding the object. This will give a better bounding box and segmentation. We can use an existing image annotation tool GUIs

Third-party:

As we said the data is become a essential commodity in this deep learning, many start-up company has come forward and started giving their own image annotation service which they will gather and label it. What we have to do is simply describe the kind image you need. For example mighty is one such Startup which used for self-driving car image annotation and have become big with that. Mighty AI is better than the Payment AI, offering many domain of image annotation.

4.3.2 Emotional VGGNet training

In this project, VGGnet algorithm is used to train the emotional.

The procedure of training a Deep Learning version involves offering a Deep Learning algorithm (this is, the learning algorithm) with training facts to research from. The term

Deep Learning model refers to the model this is created with the aid of using the training procedure.

The training facts need to include the answer, that's called a goal or goal attribute.

The learning algorithm reveals patterns with inside the training facts that map the input facts attributes to the goal (the solution which you need to predict), and it outputs a Deep Learning model that captures those patterns.

Using the Deep Learning model to get predictions on new data for which do now no longer realize the goal. In this the use of Emotional VGGNet algorithm to enforce model and getting the prediction of the model

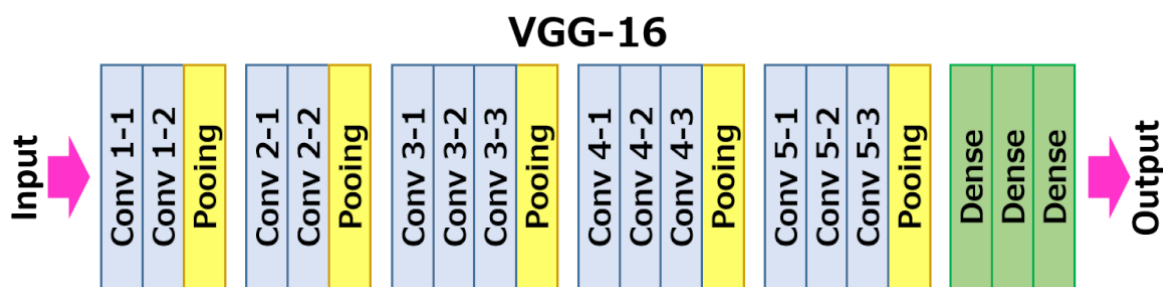


Figure 4.3: VGG-16 Input Output

Taking into the fact that the network wants to be small enough and rapid enough to run in real-time on our CPU. Once the network is skilled some code is written to load the serialized version from disk and apply it to a video flow to discover emotions in real-time. When studying emotion recognition, it's critical to now no longer focus on a single beauty label (as we every so often do in extraordinary type problems). Instead, it's a lot more advantageous for anyone to look at the opportunity of each emotion and represent the distribution. The dataset includes 28,709 pictures, every of which might be 48_48 grayscale pictures. The faces are routinely aligned such that theyre about the same period in every image. Given those pictures, the intention is to

categorize emotion expressed on each face into seven exquisite classes:

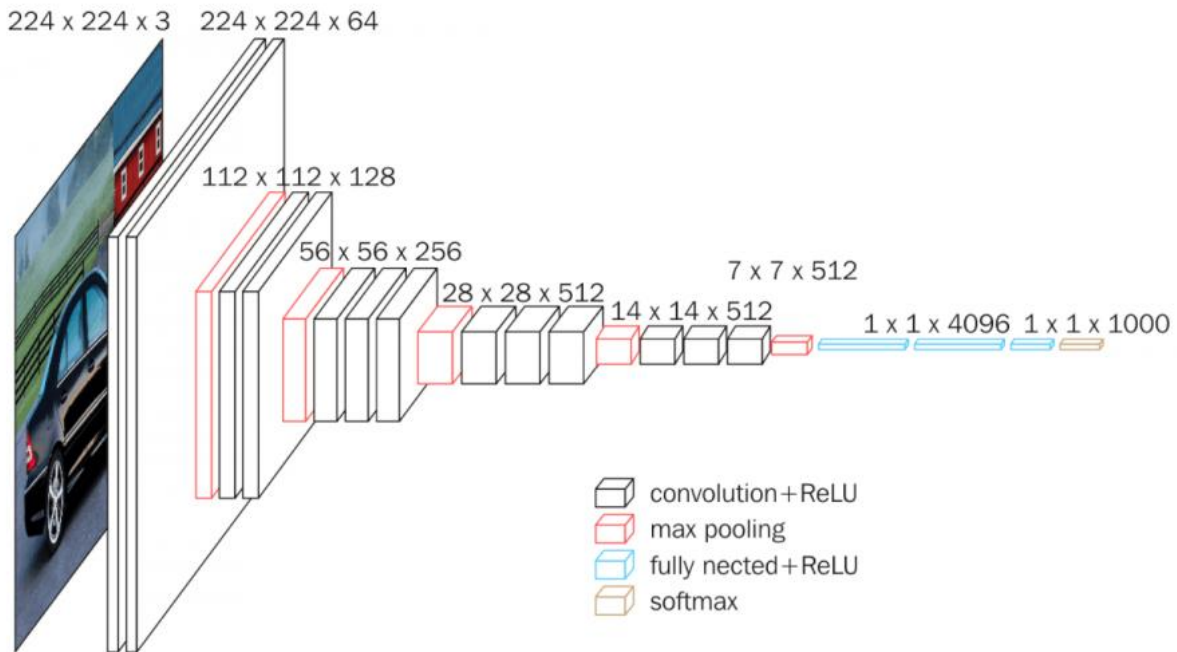


Figure 4.4: Architecture of VGG16

4.3.3 Audio dataset training:

VGGish is professional in coping with the audio information thoroughly and might run RNN system higher. To extract audio function embedding's from audio recordings VGGish is used. VGGish is a version of the VGG version [10], and it is able to be used to generate excessive abstraction stage function embedding's from audio recordings. In preceding work, it's far accomplished because it acquire higher overall performance of audio type even as incorporating with VGGish than feeding uncooked audio functions with inside the type task. In our approach, we observe and use VGGish to generate audio function embedding from audio recordings. Sixteen kHz mono is the primary resample enter. Then, a log Mel spectrogram tensor is extracted from each one-2d segment. Log Mel spectrogram tensor is the enter for VGGish. One embedding vector is the output end result of 1 2d of audio enter, to gift the entire audio signal, we take the common of its one-2d embedding vectors. We are the usage of a version posted with the aid of using Google and skilled the usage of Youtube-8M.

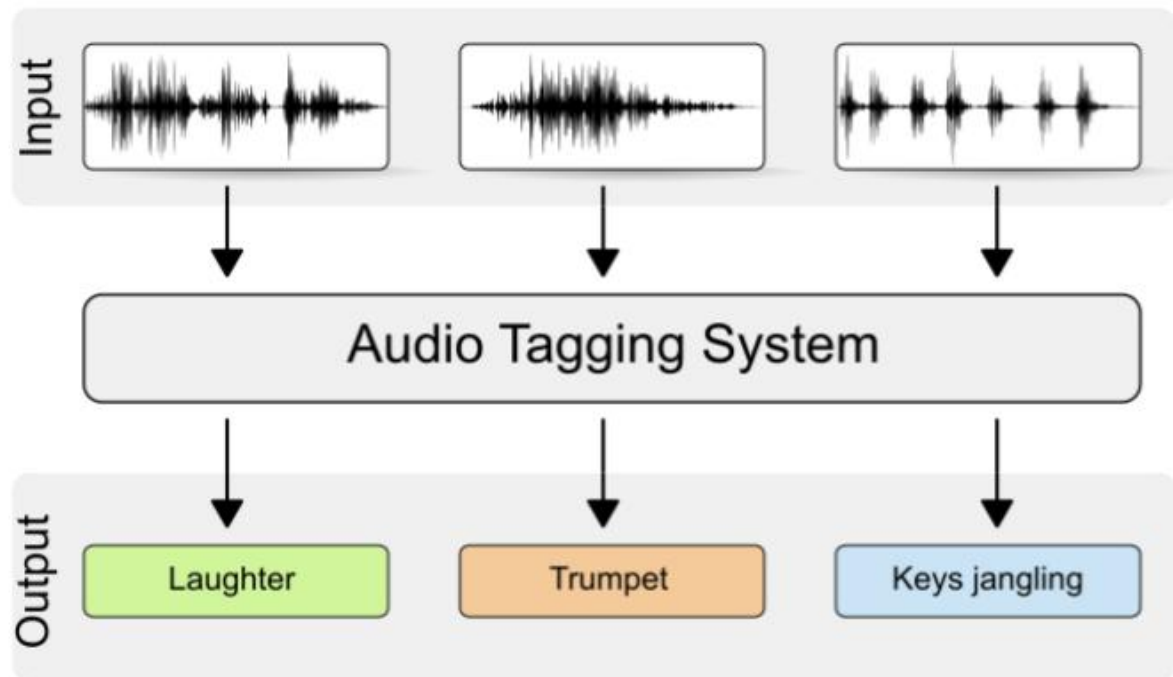


Figure 4.5: Architecture of VGGish

4.3.4 Mobile App Development & Live Streaming:

4.3.4.1 Mobile App Development:

React Native is framework used to assemble app in a fantastic series without delays and lags, the use of hierarchy UI components the use of JavaScript codes. If you want to create a app with local appearance and experience then React local is the first-rate alternative as it has a difficult and rapid of components for every ios and android. Mobile development has witnessed outstanding growth. According to statistics, cell applications will generate an expected 188 billion U.S. dollars as a go back in app stores, commercials and in app purchases withinside the twelve months of 2020. Right from single and business enterprise app developer, every body require a app with more than one screen, god design, smooth running, tremendous performance. But immoderate appearing and smooth apps requires increasingly more time to be created at the same time as in evaluation to pass platform which gives faster development but compromises it in performances. So react local is the excellent and precious possibility to built an app with equal performances and faster building in brief time collectively with the used character interface and enjoy requirements which offers in native app.

React Native can be used to create an app by reusing the already existing written code for another app. This makes react native a best suitable app developing tool for both the OS that is iOS and Android including same features and even with zero lags. Since JavaScript is common among front end engineers, React Native supports the codes written on JavaScript also. This makes everyone a talent pool.

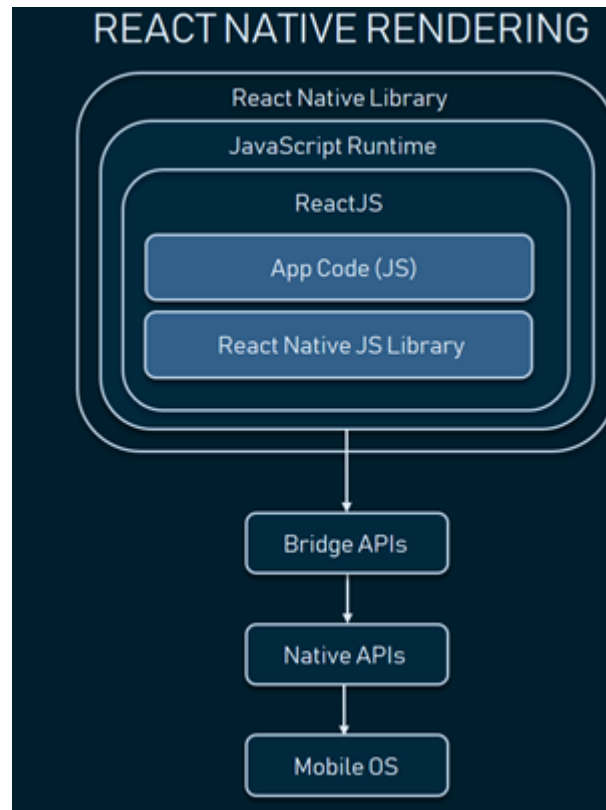


Figure 4.6 Mobile App Developments

4.3.4.2 Live Streaming:

The internet of things is a computing tool which includes mechanical and virtual machines, animals, persons, objects which had been provided with particular identifiers. IOT has the capacity to switch the information over diverse networks with none human to device or human to human transmission. Here IOT is used for live streaming.

Streaming media is a media used for receiving the information to an end user which was continuously delivered by another end provider. The term “to Stream” means to process of delivering media in the manner. Delivery method of medium is said because it suits rather than medium itself. It reduces the process of receiving and downloading and at last viewing the entire file the end user which consumes time and can’t be used in the SOS systems.

4.3.5 GPS Integration in Mobile Application:

In this project, the Geolocation API for integrating GPS in mobile application.

Geolocation as an API has distinct techniques that may be utilized in mobile application. It's an effective API for mobile development. Many well-known apps like Rental riding app UBER, maps app like Google Maps, and location features in Instagram the use of this equal API. React native has a plus factor of taking important gain of this API and contain it with its app via way of means of extending the method of Geolocation web specification.

The Geolocation API returns distinct techniques such as get Current Position to get the current location and watch Position to enrol in location updates. They are to be had in React Native as poly fill.

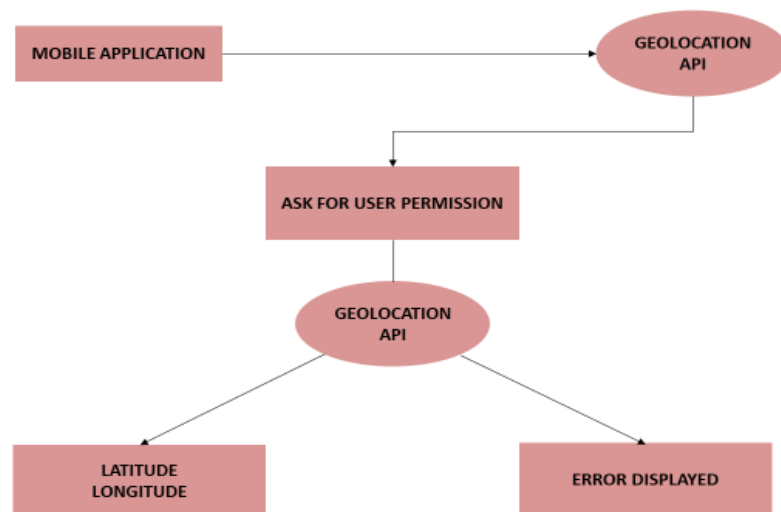


Figure 4.7 Geolocation API

Geolocation provides in a multitude of contexts. The government and police use it for security purposes, such as unmanned aerial vehicles or ankle bracelets, which when you think about the fact that neither type of data collection is precise raises some unsettling implications. But, some companies took this API to next level by integrating it with games we play by AR (Augment Reality) like the game POKEMON GO and many others.

Raspberry Pi was initially used for maintaining and monitoring of the attendance record in UK by the Raspberry Pi Foundation. A two arm organization is the one who is behind the development of the Raspberry Pi. Raspberry pi initially introduced two models by its foundation. And later it has evolved through so many variation and versions that features in memories and device support.

The raspberry pi is in the form of a motherboard having chips mounted on it with ports exposed out. Even though it looks small, you will get all the ports you need: right from input ports, output ports, computing support and storage devices.

The Pi runs fully on an open source software which gives students an ability to mix and match according to their work they want to do.

The Raspberry Pi debuted in February 2012. The fact of creating Raspberry Pi, the group behind Raspberry Pi foundation wanted the students to know and get interest in how computer works and for fun computing. Not like using a fully mounted and closed manufacturer's computer, the Pi allows and shows the guts behind plastic. Even the software, by the virtue of using distinctive feature of being open-source, gives a possibility for college students to discover the underlying code-in the event of requirement.

The main objective of Raspberry pi is, it is cheap and easy replaceable and to be an ideal learning tool. It needs only a keyboard and a monitor or TV to run. These makes the Raspberry pi an evolving device in modern day computing. The Raspberry Pi 3 module is a quad core processor which is a way faster than its previous version that is the Raspberry Pi module 2. If we are interested in its bench marks: The Raspberry Pi is 50-60 % faster than the Raspberry Pi 2 and 10x faster.



Fig.4.8Raspberry

When in comparison to the First Pi. If you are taking real time software among first Pi and Pi3, there'll be overall performance growth with the aid of using 2.5 x, and in single threaded software you can see a lift of 20x whilst video playback while it runs

by chips NEON engine. The Pi three has visible a spike in its Media Centre credentials, that is now can play a 1080p MP4 video in 60fps with a bit rate of 5400Kbps. But the smoothness of the video is completely depending on the source video; it relies upon at the overall performance, bit rate and player used. The Pi three is likewise able to Wi-Fi net that's incorporated in it; it is also built in Wi-Fi and a Bluetooth board. It additionally has a help besides at once from a USB attached hard drive or a pen drive, additionally it offer booting from a network linked the use of PXE, Which could be very a great deal beneficial in faraway laptop connection and sharing image among multiple machines.

Camera module:

USB webcam to take pictures and video on the Raspberry Pi. It is used for recognize a correct student with full of accuracy. A webcam is a device used to feed, streams or send an image or a video to a computer to a computer network in real time such as internet. A webcam is a video camera in small size usually used to place on a desktop of built in hardware for various purposes. The webcam which are specifically designed to meet the requirement by a Raspberry Pi module gave a fair number of features to make it superior to other webcams available in the market.

The Camera board of Raspberry Pi plugs to the CSI connector pin on Raspberry Pi board, which is able to deliver an excessive first-rate 5MP selection image with a 1080p HD video recording at 30 frames in keeping with second rate. The ultra-modern version this is known as version 1.3 is synthetic with the aid of the use of the Raspberry Pi basis has a 5MP omnivision 5647 sensor in a focal point module. Then it's far linked to the Pi module via a 15 pin Ribbon cable to 15 pin MIPI CSI (Camera Serial Interface), this is dedicatedly designed for interfacing the cameras. This CSI is capable of excessive facts charges and includes pixel records to the Broadcom processor quantity BCM2835. It is a tiny one having a 25mm x 20mm x 9mm in duration, and weighs spherical 3g. This makes it a without a doubt ideal one for cellular and different packages in which length matters. The digital camera by myself has a selection of 5MP. The digital camera itself is capable of taking a 2592 x 1944 pixel static pictures. It additionally allows 1080p at 30 frames in keeping with second and 720p at 60 frames in step with second. It moreover includes 640x480p at 60/90 video recording which greater than sufficient in our work.

CHAPTER 5

SOFTWARE DESCRIPTION

The motive of the Software Requirement Specification is to supply the specification of the analysis task and additionally to set up entire facts approximately the requirement, conduct and additionally the opposite constraint like useful overall performance and so on. The predominant purpose of the Software Requirement Specification is to absolutely specify the technical necessities for the software program product in a concise and in useful manner.

5.1 VISUAL STUDIO

In this project the Microsoft visual studio is used as an IDE.

Visual Studio is a powerful developing tool which is used for debugging and intellisense code completion.

Visual studio is an editor that receives from your way. The delightfully frictionless edit-build-debug cycle means more time executing your idea, and much less time fiddling together along with your environment.

Visual Studio Code helps diverse different Operating System platform- in order that we will ground run regardless of the platform is.

At its heart, Visual Studio Code can be used for day to day uses since it has a lightning fast source code editor. With the help from hundreds of languages, Visual Studio Code helps us be instantly productive with syntax highlighting, syntax bracket matching, snippets, box-selection, auto indentation, and more. You can navigate your code with ease by easy customization, keyboard shortcuts, community contributes keyboard shortcut mapping

For a few serious coding, you'll regularly gain from tools with greater code understanding than simply blocks of text. Built-in assist for IntelliSense code completion, wealthy semantic code know-how and navigation, and code refactoring is included in visible studio code.

And whilst the coding gets tough, debugging also receives tough. Debugging is one of the characteristic that builders leave out maximum in a leaner coding experience, so we made it happen. An interactive debugger is likewise included in visual studio code, so that you can step through supply code, inspect variables, view name stacks, and execute instructions withinside the console.

Visual studio code integrates with build and scripting tools to carry out common duties making regular work a whole lot faster. Visual studio Code has support for Git

so wherein we are able to work with supply manipulate without leaving the editor including viewing pending modifications diffs.

We customize each characteristic to our liking and install any wide variety of third-party extensions. Since maximum scenarios work "out of the box" without a configuration, VS Code additionally grows with you, and encourages you to optimize your enjoy to suit your precise needs.

VS Code consists of enriched integrated assist for Node.js improvement with typescript and JavaScript, that's powered with the aid of using the underlying technology which drive Visual Studio. VS Code also consists of first rate tooling for net technology together with JSX/React, HTML, SCSS, CSS, JSON, and LESS..

Visual Studio Code combines the native, best of web and language-specific technology. Using Electron, Visual studio Code combines net technology including JavaScript and Node.js with the ability and pace of native apps. Visual Studio Code makes use of a quicker and more recent model of the identical industrial-electricity HTML-based editor that powered the "Monaco" that is a cloud editor, Internet Explorers F12 Tools, and similar different projects. Additionally, VS Code makes use of a tools service architecture that permits it to combine with some of the identical technology that power Visual Studio, which includes Typescript, ROSLYN for internet the Visual Studio debugging engine, and lots of more.

VS Code consists of a public extensibility version that lets customers build and use extensions, and richly personalize their edit-build-debug experience.

5.2 Python:

In our project, python is used as the programming language.

Python is, high-stage programming language primarily based totally on item orientated with included dynamic semantics in most cases for net and app development. It is extraordinarily appealing in Rapid Application Development as it gives dynamic typing and dynamic binding options.

Python is easy to learn since it requires a unique syntax as it is a simple language that focuses on readability. Programmers can read and translate Python code much easier than other languages. In turn, this reduces the cost development and programme maintenance because it allows teams to work collaboratively without significant language and experience barriers.

Python also supports the use of modules and packages, which means that programs can be designed in a modular style and code can be reused across a variety of projects.

One of the promising benefits of Python is that both the same old library and the interpreter are available free of cost, in every binary and supply form, therefore they're without troubles accessible. There isn't any exclusivity either, as Python and all the crucial equipment are available on all fundamental platforms. Therefore, it's far a first rate opportunity for developers who don't want to worry about paying excessive development costs.

5.3 Android Studio:

In our project android studio is used for mobile application development. Android Studio is built on jet brains idea software and designed for android development. It is also the official integrated development environment for Google's operating system. It can also be downloaded on windows, macOS and Linux. It is used to replace eclipse android development tools as the primary IDE for native android application development. To write some code for your Android application, some kind of environment or code editor that will make the task easy. Android Studio is used for development of application with the help of integrated development environment. It is based on Intelligence Idea. Android studio provides a number of features to enhance the productivity while building android application

Material design components has been updated for new project template..

Integrated emulator window: The emulator can directly be run in the IDE instead of on its own, separate window.

Dagger/Hilt code navigation: Clicking on the new gutter actions to find out more about Dagger and Hilt types in your code.

ML Model Binding: Studio can generate code for an imported Tensor Flow Lite model which makes it easier to interact with that model from the app code.

CHAPTER 6

RESULTS AND DISCUSSION

6.1 FINAL RESULTS OBTAINED

To begin with, testing of the trained model, we can split our project into modules of implementation that is done. Dataset collection involves the process of collecting different emotional dataset. Various datasets were collected and one example among the collected dataset can be found below

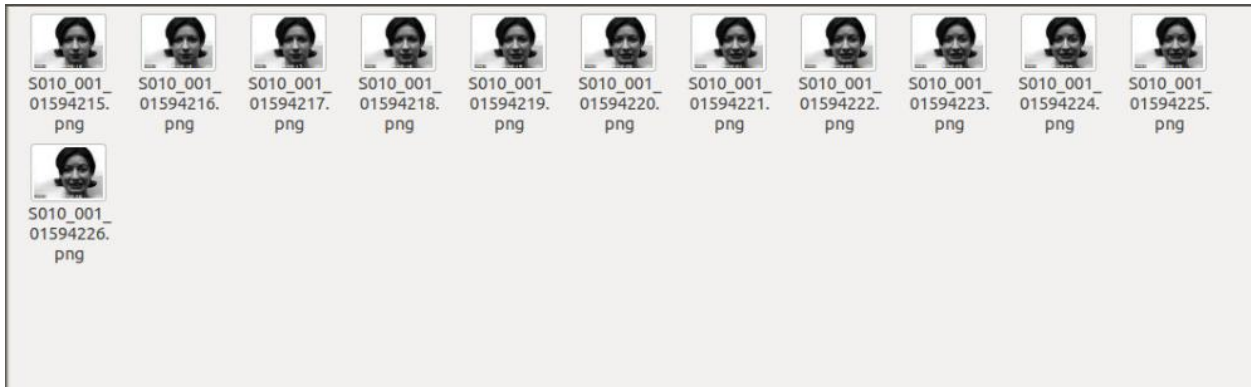


Figure 6.1 Dataset Collected

These datasets are then pre-processed to form an equal aspect ratio so that it can be made ready for training with the model. The datasets are separated into different categories to undergo pre-processing which can be seen in the below figure.

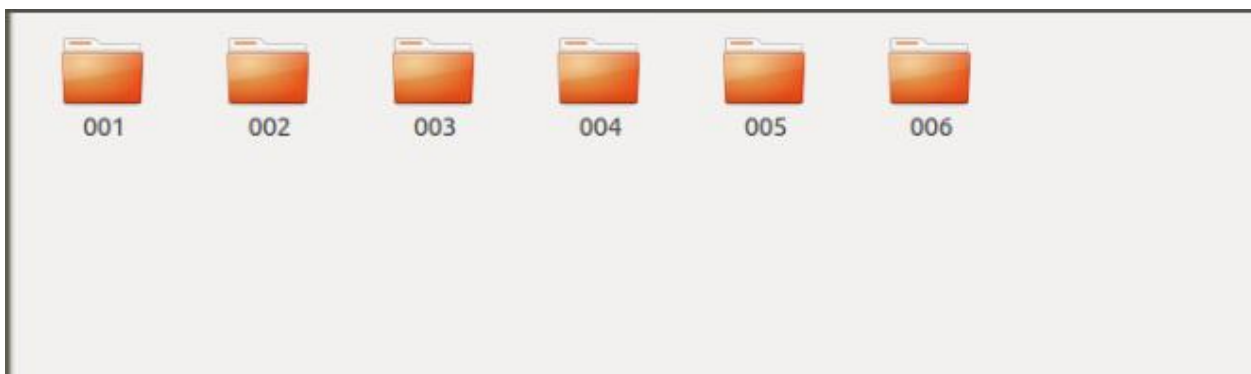


Figure 6.2 Dataset separation

The next step is data augmentation which duplicates the collected data into many images so that the prediction percentage can be increased. A sample augmentation of an image can be seen in the below figure. The below screenshot shows the image before augmentation



Figure 6.3 Image Before Augmentation

The below image shows the image after implementation.

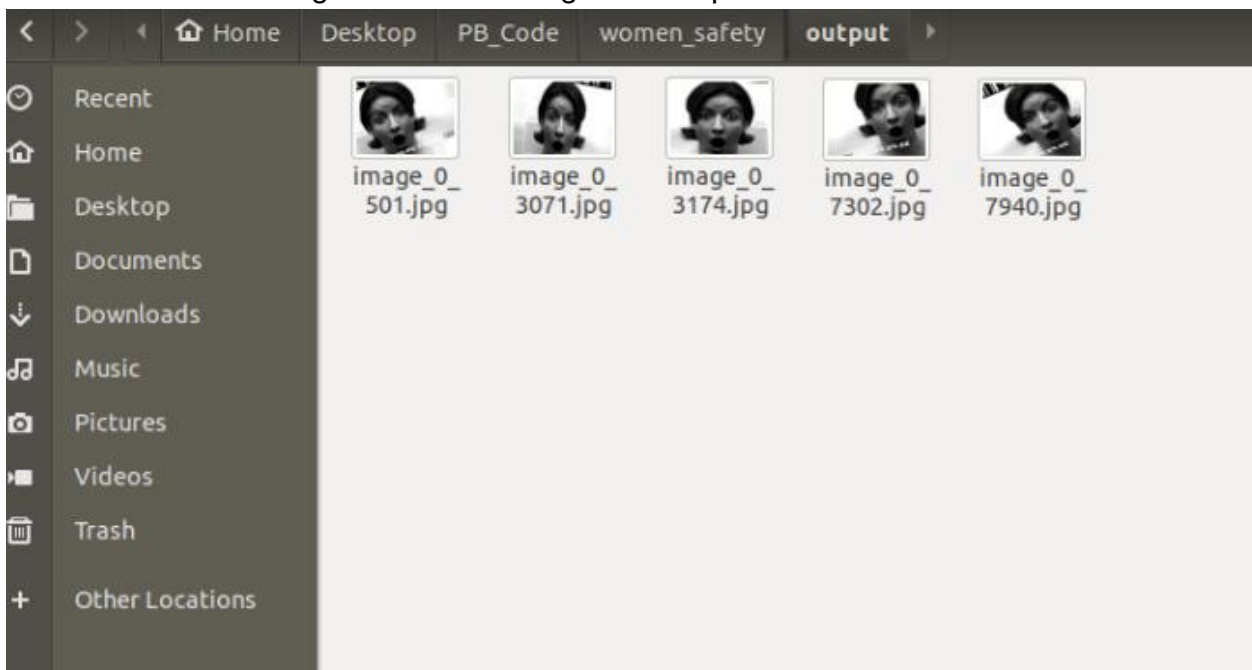


Figure 6.4 Imagesafter Augmentation

These datasets are then pre-processed to form an equal aspect ratio so that it can be made ready for training with the model. The below screenshot shows the data image before undergoing pre-processing



Figure 6.5 Image before pre-processing

The below screenshot shows the pre-processing code which is executed to get the pre-processed output

```

1  # USAGE
2  # python minivggnet_flowers17.py --dataset ../datasets/flowers17/images
3
4  # import the necessary packages
5  from sklearn.preprocessing import LabelBinarizer
6  from sklearn.model_selection import train_test_split
7  from sklearn.metrics import classification_report
8  from deeplearning.preprocessing import ImageToArrayPreprocessor
9  from deeplearning.preprocessing import AspectAwarePreprocessor
10 from deeplearning.datasets import SimpleDatasetLoader
11 from deeplearning.nn.conv import MiniVGNet
12 from keras.optimizers import SGD
13 from imutils import paths
14 import matplotlib.pyplot as plt
15 import numpy as np
16 import argparse
17 import os
18
19 # construct the argument parse and parse the arguments
20 ap = argparse.ArgumentParser()
21 ap.add_argument("-d", "--dataset", required=True,
22                 help="path to input dataset")
23 args = vars(ap.parse_args())
24
25 # grab the list of images that we'll be describing, then extract
26 # the class label names from the image paths
27 print("[INFO] loading images...")
28 imagePath = list(paths.list_images(args["dataset"]))
29 classNames = [pt.split(os.path.sep)[-2] for pt in imagePath]
30 classNames = [str(x) for x in np.unique(classNames)]
31
32 # initialize the image preprocessors
33 aap = AspectAwarePreprocessor(64, 64)

```

Figure 6.6 Pre-processing code

The below screenshot shows the image after pre-processing set to a resolution of 32x32



Figure 6.7 Pre-processing code

After this the final implementation is done where the training process takes place and the results are obtained. The type 1 execution signals the parent app that the child is in danger, when it recognizes an abnormal audio or visual from the surrounding of the hardware module. The below screenshot shows the flow for type-1 execution:

```
(env_dlib) PS E:\SIEORA_PROJECT_WORK\development\women_safety> python final.py --type 1
2020-11-11 16:27:55.056333: I tensorflow/stream_executor/platform/default/dso_loader.cc:44] Successfully opened dynamic
library cudart64_100.dll
192.168.1.105
* Serving Flask app "final" (lazy loading)
* Environment: production
  WARNING: This is a development server. Do not use it in a production deployment.
  Use a production WSGI server instead.
* Debug mode: on
* Running on http://0.0.0.0:8000/ (Press CTRL+C to quit)
2020-11-11 16:28:03.077965: I tensorflow/stream_executor/platform/default/dso_loader.cc:44] Successfully opened dynamic
library nvcuda.dll
2020-11-11 16:28:03.092192: I tensorflow/core/common_runtime/gpu/gpu_device.cc:1618] Found device 0 with properties:
name: GeForce GTX 1050 Ti major: 6 minor: 1 memoryClockRate(GHz): 1.62
pciBusID: 0000:01:00:0
2020-11-11 16:28:03.092361: I tensorflow/stream_executor/platform/default/dso_loader.cc:44] Successfully opened dynamic
library cudart64_100.dll
2020-11-11 16:28:03.101836: I tensorflow/stream_executor/platform/default/dso_loader.cc:44] Successfully opened dynamic
library cublas64_100.dll
2020-11-11 16:28:03.106107: I tensorflow/stream_executor/platform/default/dso_loader.cc:44] Successfully opened dynamic
library cufft64_100.dll
2020-11-11 16:28:03.108799: I tensorflow/stream_executor/platform/default/dso_loader.cc:44] Successfully opened dynamic
library curand64_100.dll
2020-11-11 16:28:03.133909: I tensorflow/stream_executor/platform/default/dso_loader.cc:44] Successfully opened dynamic
library cusolver64_100.dll
2020-11-11 16:28:03.139536: I tensorflow/stream_executor/platform/default/dso_loader.cc:44] Successfully opened dynamic
library cusparse64_100.dll
2020-11-11 16:28:03.141400: W tensorflow/stream_executor/platform/default/dso_loader.cc:55] Could not load dynamic libra
ry 'cudnn64_7.dll'; dlopen: cudnn64_7.dll not found
2020-11-11 16:28:03.141605: W tensorflow/core/common_runtime/gpu/gpu_device.cc:1641] Cannot dlopen some GPU libraries. P
```

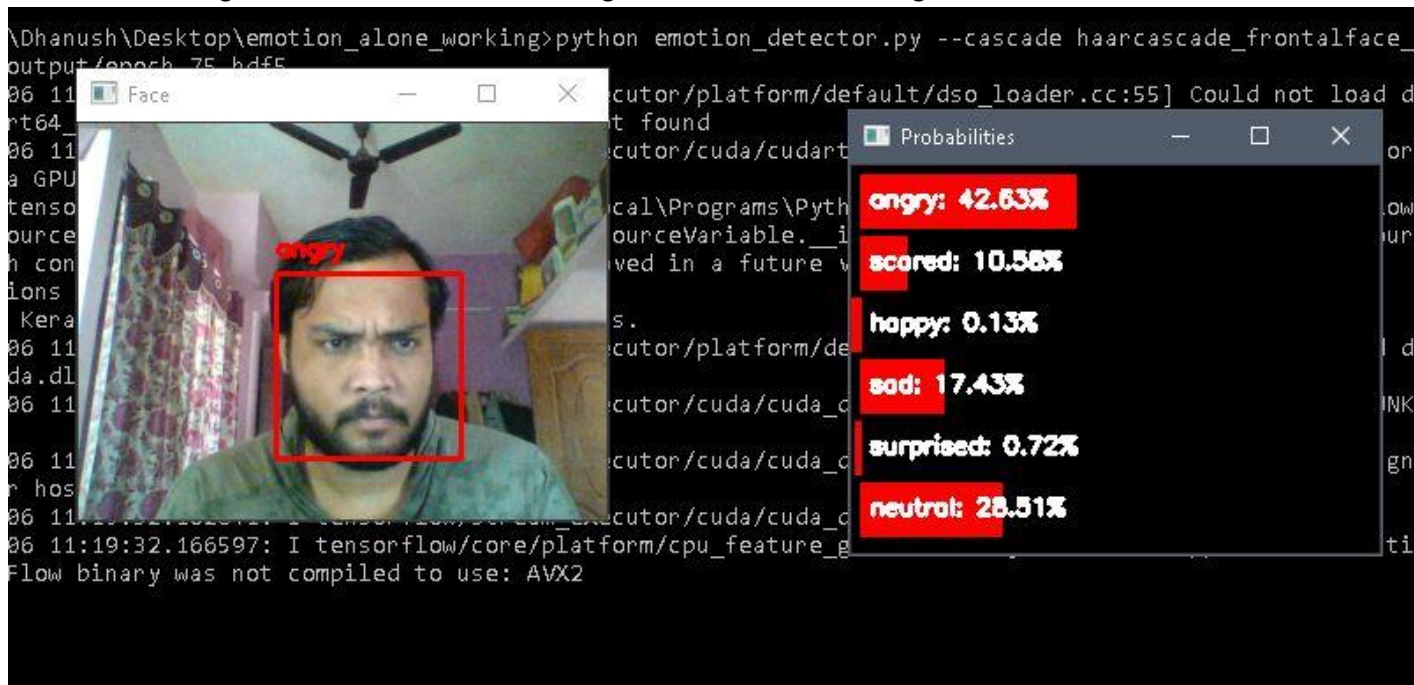
Figure 6.8 Type 1 executions

The type 2 execution signals the parent app that the child is in danger, when it recognizes both abnormal audio and video from the surrounding of the hardware module. The below image shows the flow for type-2 execution.

```
E:\SIEORA_PROJECT_WORK\development\women_safety\audio\utils\youtube8m\input.py:34: FutureWarning: Using a non-tuple sequence for multidimensional indexing is deprecated; use 'arr[tuple(seq)]' instead of 'arr[seq]'. In the future this will be interpreted as an array index, 'arr[np.array(seq)]', which will result either in an error or a different result.
  data[slices],
('bk_ground', 0.7557400465011597)
0
[INFO] 2020-11-11 16:30:18,824: Stop processing.
2020-11-11 16:30:25.026792: I tensorflow/core/common_runtime/gpu/gpu_device.cc:1159] Device interconnect StreamExecutor with strength 1 edge matrix:
2020-11-11 16:30:25.026949: I tensorflow/core/common_runtime/gpu/gpu_device.cc:1165]
2020-11-11 16:30:26.839148: I tensorflow/core/common_runtime/gpu/gpu_device.cc:1159] Device interconnect StreamExecutor with strength 1 edge matrix:
2020-11-11 16:30:26.839350: I tensorflow/core/common_runtime/gpu/gpu_device.cc:1165]
[INFO] 2020-11-11 16:30:29,097: Start processing.
E:\SIEORA_PROJECT_WORK\development\women_safety\audio\utils\youtube8m\input.py:34: FutureWarning: Using a non-tuple sequence for multidimensional indexing is deprecated; use 'arr[tuple(seq)]' instead of 'arr[seq]'. In the future this will be interpreted as an array index, 'arr[np.array(seq)]', which will result either in an error or a different result.
  data[slices],
('human_normal1', 0.4343715310096741)
0
[INFO] 2020-11-11 16:30:29,216: Stop processing.
2020-11-11 16:30:37.823669: I tensorflow/core/common_runtime/gpu/gpu_device.cc:1159] Device interconnect StreamExecutor with strength 1 edge matrix:
2020-11-11 16:30:37.823833: I tensorflow/core/common_runtime/gpu/gpu_device.cc:1165]
2020-11-11 16:30:40.152895: I tensorflow/core/common_runtime/gpu/gpu_device.cc:1159] Device interconnect StreamExecutor with strength 1 edge matrix:
2020-11-11 16:30:40.153100: I tensorflow/core/common_runtime/gpu/gpu_device.cc:1165]
[INFO] 2020-11-11 16:30:41,879: Start processing.
E:\SIEORA_PROJECT_WORK\development\women_safety\audio\utils\youtube8m\input.py:34: FutureWarning: Using a non-tuple sequence for multidimensional indexing is deprecated; use 'arr[tuple(seq)]' instead of 'arr[seq]'. In the future this will be interpreted as an array index, 'arr[np.array(seq)]', which will result either in an error or a different result.
  data[slices],
('human_abnormal', 0.7193108201026917)
1
[INFO] 2020-11-11 16:30:42,010: Stop processing.
type1 and emotion 1
200
{'multicast_id': 5650806653390159358, 'success': 1, 'failure': 0, 'canonical_ids': 0, 'results': [{'message_id': '0:1605092443980509%3188d5d23188d5d2'}]}
```

Figure 6.9 Type 2 executions

The below image shows the emotion recognition and voice recognition in flow



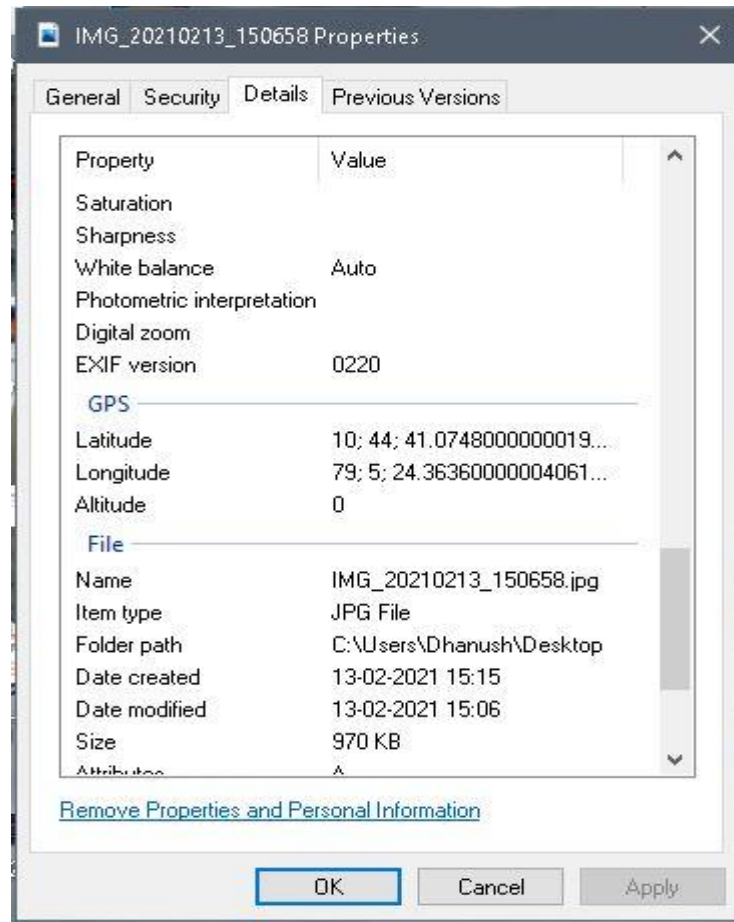
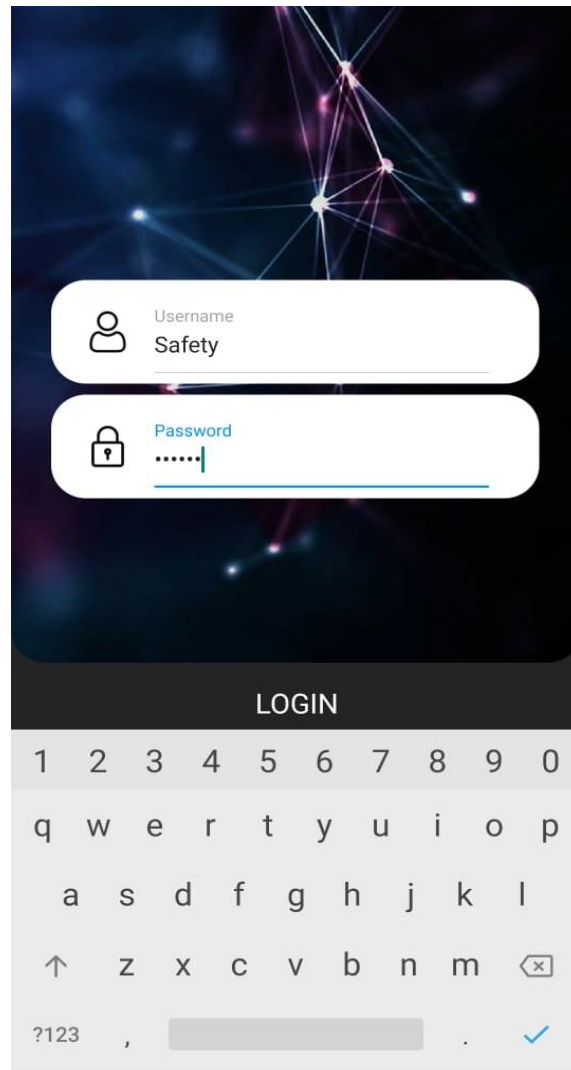


Figure 6.10 Emotion recognition and voice recognition

The emotion and the voice captured from the processing unit is evaluated and signals the parent app that the child is in danger. The below image shows the login page of the child application



A login interface with a dark background featuring a glowing network of nodes and lines. The interface includes two input fields: a username field with a person icon and the text 'Username' and 'Safety', and a password field with a lock icon and the text 'Password' and '.....'. Below the fields is a 'LOGIN' button. At the bottom is a virtual keyboard with rows of numbers, letters, and symbols.

Username
Safety

Password
.....

LOGIN

1 2 3 4 5 6 7 8 9 0
q w e r t y u i o p
a s d f g h j k l
↑ z x c v b n m ⌫
?123 , . ✓

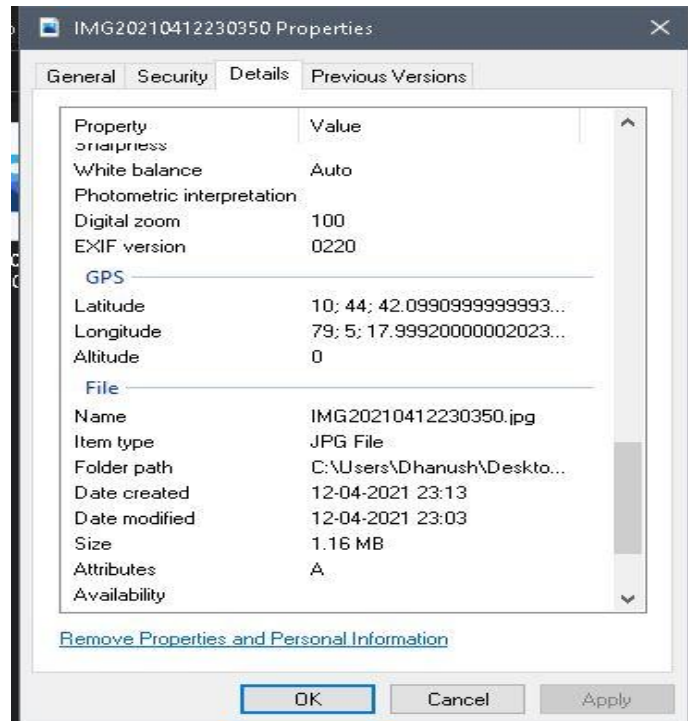


Figure 6.11 Child login page

On successful login on the child web application page, the user is routed to the homepage.

The below image shows the child application home page when the women is safe.

Women's Safety App



WOMEN IS SAFE

Figure 6.12 Home page

On the hardware detecting the women is in danger it immediately sends the location data to the parent application through MQTT.

The below image shows the page of the child application when in danger.

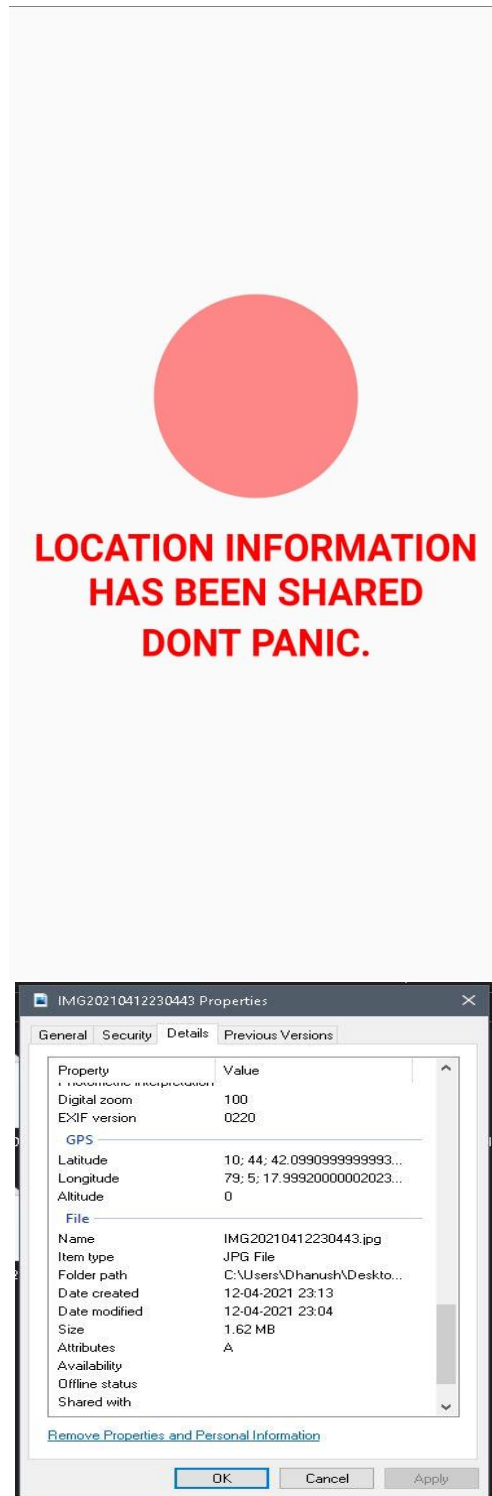


Figure 6.13 Help page

The child application then sends its current location the parent application. The below image shows the login page of the parent application

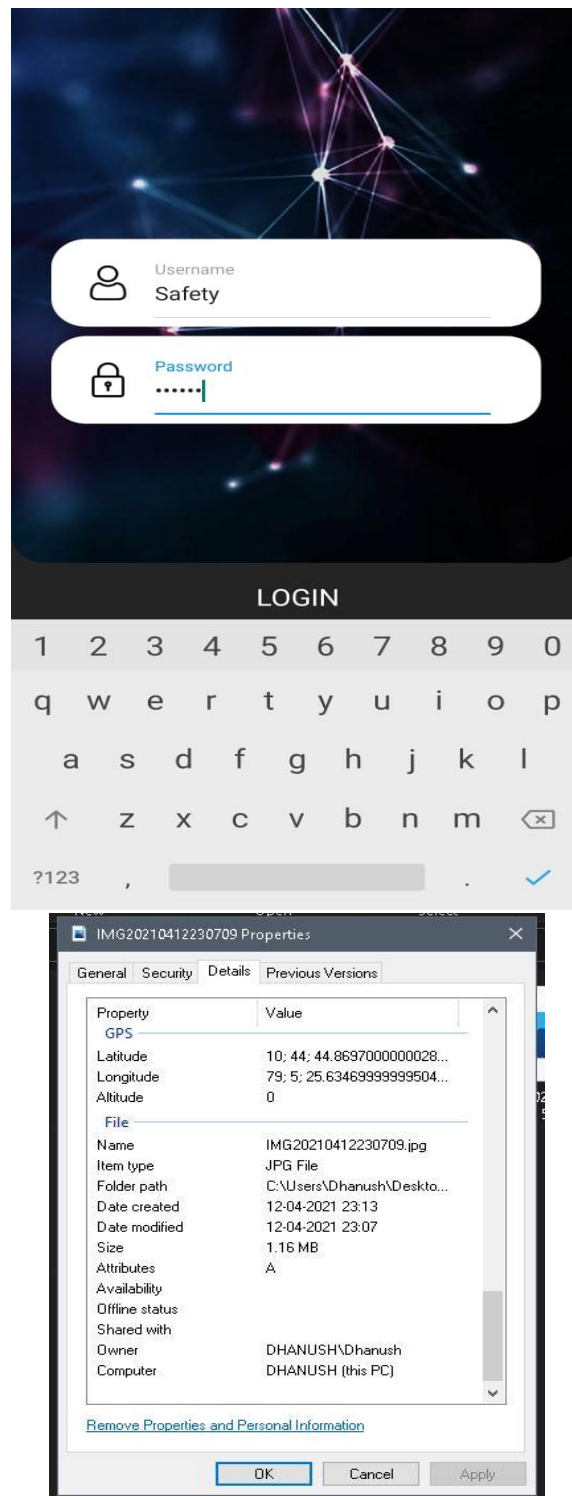


Figure 6.14 Parent login page

On successful login on the parent mobile application page, the user is routed to the homepage. The below image shows the parent application home page when the

women is safe.



Figure 6.15 Home page of parent

On the parent application being notified that the women are in danger receives the current location of the child through MQTT and a URL from the processing module to live stream. The below image shows the page when the parent is notified the user is in danger.

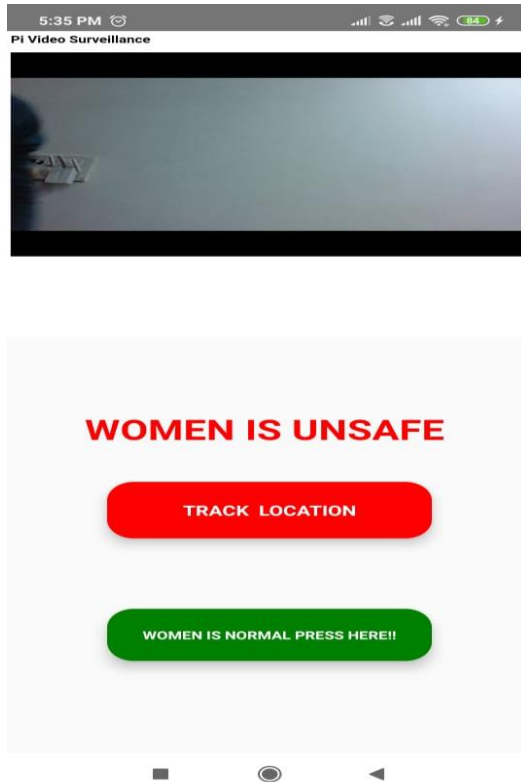


Figure 6.16 Child in danger page

On clicking the track location button, the current location of the child is displayed in the parent application. The below image shows the current location of the women.

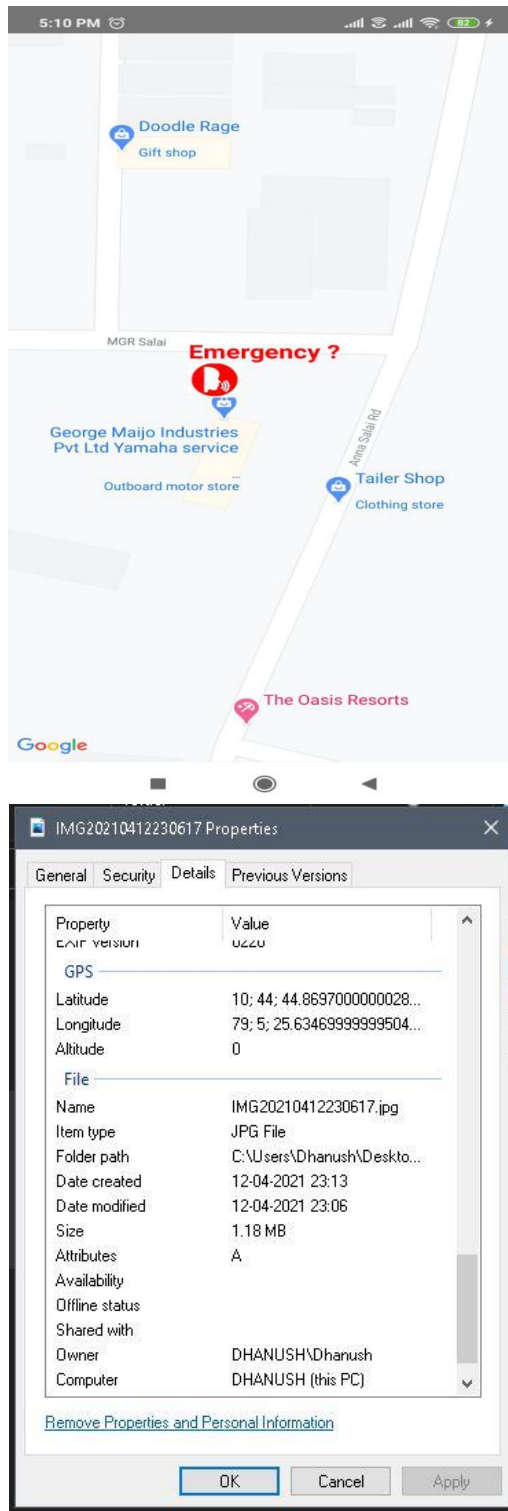


Figure 6.17 Location page of child

Thus, from the above results and discussion, it is clear that we have efficiently made a project for safeguarding the women from unwanted mishaps effectively by providing

auto emotion recognition and live streaming. Thus, we have successfully implemented the scope of the project.

6.2 COMPARISON BETWEEN EXISTING SYSTEM AND PROPOSED SYSTEM

In existing system, focused on only differentiating the type of emotions. The system aimed to provide a cheap and effective solution to the problem of emotion recognition. The only classifies and recognizes only the type of emotions. There are no steps taken based on the data received. The proposed system, overcame all of the disadvantages in the existing system by the successful implementation of two mobile applications developed to receive notifications and to view live streaming. The system uses emotional VGGNET that provides very high accuracy in the results

FACTORS	EXISTING SYSTEM	PROPOSED SYSTEM
ALGORITHM	Deeply-Supervised Attention Network (DSAN)	Emotional VGGNET
ACCURACY	Very low compared to other methods	Has very high accuracy
USER-FRIENDLY	The system is not user friendly.	The system is very user friendly uses a mobile application as interface.
APPLICATION	The method is applicable only for emotion recognition.	The method is applicable for women safety security purposes.

CHAPTER – 7

CONCLUSION AND FUTURE WORK

7.1 CONCLUSION

This Project is successfully done for protecting women by continuously recognise the facial emotion and vocal recognition by already proposed Deep Learning process. This also help in women's life like live streaming the face using web cameras and sending the data to the parent mobiles during abnormal situation. So, reduces the criminal activity and eliminates the mishaps with women by this project.

7.2 FUTURE WORK

In the coming future, we review the application of the women safety technology in the safety field and it can promote for advance women safety technology with more accuracy. In this field they are more chance to develop or convert this project in many ways. Thus, this project has an efficient scope in coming future where this idea can be converted to computerized production in a cheap way.

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