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Confidence Detection using Machine Learning

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Abstract: *Lack of Confidence is considered as people who have low confidence level or at a level that is not inadequate to face many challenges and obstacles in life. Contrary to those who have high confidence, someone with low self-confidence has a huge obstacle in itself when attempting to reach success. It is an issue with which scores of people are grappling today. Stemming mostly from negative experiences and encounters, it causes hindrance in enabling one to become successful and live a fulfilling life. We don't give that much importance to these constraints, so we fail every time. This app will help people know how much confident they are so that they can improve themselves to be at their best and achieve great success one wants. We will recommend what changes you must adapt to improve confidence. We will get the audio data and visuals as input and by testing it we will tell you the confidence level of person. Then if the confidence level is below 75%, we will recommend some course or exercises to the person to improve their confidence level.*

Keywords: Confidence detection, facial expression, Microsoft Kinect for 3D face modeling, MFCC features, CNN algorithm.

I. INTRODUCTION

Lack of Confidence is considered as people who have low confidence level or at a level that is not inadequate to face many challenges and obstacles in life. Contrary to those who have high confidence, someone with low self-confidence has a huge obstacle in itself when attempting to reach success.

In this we are going to elaborate introduction of the proposed system. This chapter includes overview of the system, motivation and objective of the system. This chapter also explain the how the report is organized.

Overview

In every field of work, confidence plays an important role. It is key to better productivity and building a healthy relationship. Even with skill and motivation, lack of confidence is always in the way of fulfilling goals. It is a common vulnerability that can be observed in people which leads to interference to the progress to achieve their goals.

We are designing the method to know the confidence of human being using machine learning algorithms. This will be a web-based application that detects a person's confidence level and will generate the report and after that it will give tips to user if their confidence is less.

Now, let's see what Confidence is? Confidence is not something that can be learned like a set of rules; confidence is a state of mind. Positive thinking, practice, training, knowledge and talking to other people are all useful ways to help improve or boost your confidence levels. For example, when someone is looking for a job and doing an interview, their self-confidence is thoroughly being tested.

If a job-seeker is experiencing pressure on him, it is usually they will divert eye contact to the interviewer. And when on a job testing, someone with low confidence will not be able to fully concentrate on the test at hand. To avoid these kinds of situations in anybody's life we are developing the project on detection of confidence level in person and recommend courses.

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1.1 Motivation

Many people are facing low confidence in themselves that's why they are not able to have a successful life. They are afraid to talk, to express their feelings in front of public, the don't feel comfortable around crowd.

This is the reason we chose this topic.

Low-confident people can be a result of many factors including: fear of the unknown, criticism, being unhappy with personal appearance (self-esteem), feeling unprepared, poor time-management, lack of knowledge and previous failures. Often when we lack confidence in ourselves it is because of what we believe others will think of us. Perhaps others will laugh at us or complain or make fun if we make a mistake. Thinking like this can prevent us from doing things we want or need to do because we believe that the consequences are too painful or embarrassing.

For example, when someone is looking for a job and doing an interview, their self-confidence is thoroughly being tested. If a job-seeker is experiencing pressure on him, it is usually they will divert eye contact to the interviewer. And when on a job testing, someone with low confidence will not be able to fully concentrate on the test at hand.

This situation can be used to determine the leadership talent, motivation, mental, personality of the job seekers. Loss of confidence also affects the work. No confidence can occur on each employee. One of the cases can occur when a business presentation. It can affect communication between the company and the client. Overall, this condition can damage the company's management.

To avoid these kinds of situations in anybody's life we are developing the project on detection of confidence level in person and recommend courses.

1.2 Problem Definition & Objective

A. Problem Definition

The aim of this project, therefore, is to effectively build a strong platform where a person can find their level of confidence. We endeavored to achieve this by creating a web-based application that Has a straightforward user interface where a person has to give a speech on a particular subject and by recognizing their audio and visual actions, 8 the software will give output whether the person is confident or not. It will have four categories namely, confidence in between 0 to 25%, 26 to 50%, 50 to 75%, 75 to 100%. If the person is not confident system will provide some tips to improve self-confidence.

B. Objective

The main aim of the project is to detect confidence level of person. Along with this the other objectives of the application will be to prevent unsuccessful and unhappy life and also to make note of what is missing in the person because of which they don't feel confident.

- To give user the way to improve their personality by recommending courses.
- To develop an adaptive system

1.2 Project Scope

- We will integrate our software with smart devices and sensors that will take humidity, temperature and other mentioned parameters to calculate the confidence.
- One of the key points for the future development is calculating the real -time with smart devices is to manage the employees that can be used further in Educational and Business Units.
- We can also assign mentors in our software one will be AI based that will be pre-trained mentor that will monitor each and every person and second will the original mentor that will check the results and after assessment he or she will provide marks manually.

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1.3 Methodologies

dlib-models:

This repository contains trained models created by Davis King. They are provided as part of the dlib example programs, which are intended to be educational documents that explain how to use various parts of the dlib library. Anyone can do whatever they want with these model files as it is released into the public domain. Details describing how each model was created are summarized below.

dlib_face_recognition_resnet_model_v1.dat.bz2:

This model is a ResNet network with 29 conv layers. It's essentially a version of the ResNet-34 network. The network was trained from scratch on a dataset of about 3 million faces. This dataset is derived from a number of datasets. The face scrub dataset, the VGG dataset and then a large number of images I scraped from the internet. I tried as best I could to clean up the dataset by removing labeling errors, which meant filtering out a lot of stuff from VGG. By repeatedly training a face recognition CNN and then using graph clustering methods and a lot of manual review to clean up the dataset. In the end about half the images are from VGG and face scrub. Also, the total number of individual identities in the dataset is 7485. Made sure to avoid overlap with identities in LFW.

shape_predictor_5_face_landmarks.dat.bz2:

This is a 5 point landmarking model which identifies the corners of the eyes and bottom of the nose. It is trained on the dlib 5-point face landmark dataset, which consists of 7198 faces. Created this dataset by downloading images from the internet and annotating them with dlib's imglab tool.

This model is designed to work well with dlib's HOG face detector and the CNN face detector (the one in mmod_human_face_detector.dat).

shape_predictor_68_face_landmarks.dat.bz2:

This is trained on the ibug 300-W dataset, 300 faces In-the-wild challenge: Database and results.

Image and Vision Computing (IMAVIS), Special Issue on Facial Landmark Localisation "In-The-Wild". 2016.

The performance of this model is summarized in the following table:

#crops	Top-1 acc	Top -5 acc
1	0.77308	0.93352
10	0.77426	0.9331

Mel-Frequency Cepstral Coefficients (MFCCs)

MFCC stands for Mel Frequency Cepstral Coefficient. It is used as first step in any automatic speech recognition. The MFCC technique aims to develop the features from the audio signal which can be used for detecting the phones in the speech. But in the given audio signal there will be many phones, so we will break the audio signal into different segments with each segment having 25ms width and with the signal at 10ms apart as shown in the below figure. On average a person speaks three words per second with 4 phones and each phone will have three states resulting in 36 states per second or 28ms per state which is close to our 25ms window.

Speech Recognition is a supervised learning task. In the speech recognition problem input will be the audio signal and we have to predict the text from the audio signal. We can't take the raw audio signal as input to our model because there will be a lot of noise in the audio signal. It is observed that extracting features from the audio signal and using it as input to the base model will produce much better performance than directly considering raw audio signal as input. MFCC is the widely used technique for extracting the features from the audio signal.

Short term power spectrum of any sound represented by the Mel frequency cepstral (MFC) and combination of MFCC makes the MFC. It can be derived from a type of inverse Fourier transform(cepstral) representation. MFC allows a better representation of sound because in MFC the frequency bands are equally distributed on the Mel scale which approximates the human auditory system's response more closely.

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It can be derived by mapping the Fourier transformed signal onto the male scale using triangle or cosine overlapping windows. Where after taking the logs of the powers at each of the Mel frequencies and after discrete cosine transform of the Mel log powers give the amplitude of a spectrum. The amplitude list is MFCC.

Sound Spectrum : A sound spectrum is a representation of a sound – usually a short sample of a sound – in terms of the amount of vibration at each individual frequency. It is usually presented as a graph of power as a function of frequency.
Linear cosine transform : They can also be called as sine and cosine tranforms which can be easily calculated using fourier transform. During our converion we will be needing both short time and fast time fourier tranform ar different stages.
Power Spectrum : It is the result of fourier tranform which we get as a representation.Also known as periodogram.
The functions are

- Image capturing
- Audio recording
- Detection Of Confidence
- Course Recommendation

In order to recognize the speech MFCC algorithm is used. This algorithm provides features like windowing the signal, applying the DFT, taking the log of the magnitude, and then warping the frequencies on the Mel scale, followed by applying the inverse DCT.

Chromagram
Since the word chromatography refers to the separation of different components from its mixture, from here we can understand the meaning of chromagram in the context of audio files. In audio file analysis, an audio file can consist of 12 different pitch classes. These pitch class profiles are very useful tools for analyzing audio files. The term chromagram represents the pitches under an audio file, in one place so that we can understand the classification of the pitches in the audio files. Pitches are the property of any sound or signal which allows the ordering of files based on frequency-related scale. It is some kind of measurement of the quality of the sound which helps in judging the sound as higher, lower, and medium.

```
array([[1.        , 0.9618017 , 0.7336141 , ..., 0.13945056, 0.14320856,
        0.27753523],
       [0.6876063 , 0.74493784, 0.59920007, ..., 0.12660551, 0.10303444,
        0.16232267],
       [0.91423744, 1.        , 1.        , ..., 0.2596749 , 0.17344482,
        0.2919754 ],
       ...,
       [0.6561969 , 0.7927054 , 0.6542877 , ..., 0.0655442 , 0.0970265 ,
        0.21360837],
       [0.46782044, 0.5979065 , 0.83328664, ..., 0.21253023, 0.17957981,
        0.34192863],
       [0.6813389 , 0.7018474 , 0.96135336, ..., 0.6640444 , 0.5531143 ,
        1.        ]], dtype=float32)
```

Above we can see the extracted waveform chroma features of the audio file which we have uploaded. These spectral features look better when they get visualized. So next in the article I will visualize them all for better understanding.

II. LITERATURE SURVEY

2.1 Literature Review

Topic 1: Stress Detector System Using IoT and Artificial Intelligence

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Author : Areej Mustafa, Maitha Alahmed, Aysha Alhammadi, Bassel Soudan
Year : 2020
This work presents the design and implementation of an IoT stress detection and classification system. Three sensors, a skin conductance sensor, an ECG sensor, and a simple skin temperature sensor are integrated into a wearable device for measurement of physiological features.

Topic 2: Detection of Stress using Wearable Sensors in IoT Platform
Author: Sreedevi Uday, C. Jyotsna, J. Amudha
Year: 2018
The proposed work concentrates on developing an IoT system which can efficiently detect the stress level of a person and provide feedback which can assist the person to cope with the stressors. The system consists of a smart band module and a chest strap module which can be worn around the wrist and chest respectively. The system monitors the parameters such as Electro dermal activity and Heart rate in real time and sends the data to a cloud-based ThingSpeak server serving as an online IoT platform. The computation of the data is performed using a `MATLAB Visualization' application and the stress report is displayed. The authorized person can log in, view the report and take actions such as consulting a medical person, perform some meditation or yoga exercises to cope with the condition.

Topic 3: IOT in HealthCare: Smart Emotion Detector Utilizing Wearable Bio Sensors
Author: Manish N. Patil, Anil R. Surve
Year: 2018
This paper proposes a system to make existing emotion detection more efficient using IoT.

Topic 4: A Review on Mental Stress Detection Using Wearable Sensors and Machine Learning Techniques
Author: Shruti Gedam(Birla Institute of Technology, Mesra), Sanchita paul
Year: 2021
The ultimate objective in stress detection is to develop a high accuracy model that is effective and affordable. The review presented here listed important information about the previous studies with sensor names, techniques used in that model, its advantages, limitations, and issues.

Topic 5: Speech Emotion Recognition(SER) Through Machine Learning
Author: Mohit Wadhwa, Anurag Gupta, Prateek Kumar Pandey
Year: 2020
Emotion detection is a challenging task, because emotions are subjective. There is no common consensus on how to measure or categorize them. We define a SER system as a collection of methodologies that process and classify speech signals to detect emotions embedded in them. Such a system can find use in a wide variety of application areas like interactive voice based-assistant or caller-agent conversation analysis. In this study we attempt to detect underlying emotions in recorded speech by analysing the acoustic features of the audio data of recordings.

III. SOFTWARE REQUIREMENT SPECIFICATION

The main aim of the project is to detect confidence level of person. Along with this the other objectives of the application will be to prevent unsuccessful and unhappy life and also to make note of what is missing in the person because of which they don’t feel confident.
To give user the way to improve their personality by recommending courses.
To develop an adaptive system.

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3.1 Requirement Specification

User classes and Characteristics

User 1: Authorized User. The person who uses the app to know the level of confidence.

3.2 Assumption and Dependencies

Dependencies:

The user should have an android phone or PC, where browser will work with an active internet connection.

Assumptions:

The System assumes that the audio, video and image capturing is done on time. In addition to this, it is assumed that the data is accordingly sync to the database.

3.3 Functional Requirements

3.3.1 System Feature 1(Functional Requirement)

Registration on the app

Saving the I'd and password to enter into software.
Generate message to send verification code.

3.3.2 System Feature2 (Functional Requirement)

Getting audio and video data

Capturing the Audio, Image and video.
Feature extraction

3.4 External Interface Requirements (If any)

3.4.1 User Interfaces

GUI will be the user interface of the system.
Web based Application will be also an interface.

3.4.2 Hardware Interfaces

Android mobile
Desktop
Any device which has web browser and stable internet.

3.4.3 Software Interfaces

Visual Studio

3.4.5 Communication Interfaces

Message Service is provided to send a notification as well as verification. And for showing result also for course recommendation.

3.5 Non-Functional Requirements

Performance Requirements

Internet connection will provide proper performance of system.

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Safety Requirements

The database may get crashed at any certain time due to virus or operating system failure. Therefore, it is required to take the database backup. Good Hardware maintenance is required.

Security Requirements

To prevent access from unauthorized user to database. Also, we can provide login system for security purpose.

3.6 Software Quality Attributes

Adaptability: Proposed System can be adapted easily to various operating environments.
Availability: Saliency approach to extract features from audio and image needs to be consistently available to the system to find confidence using these attributes.
Usability: An implied GUI and ease of use is the second most important quality attribute.
Correctness: It wills Generate Correct notification with valid message.

3.7 System Requirements:

1] Software Requirements:

C# and .net framework
visual studio 2017 and above

2] Hardware Requirements:

Mic
I5 processor
Web cam
4GB RAM
500 GB HDD

3] Database Requirements:

Fire based.

IV. SYSTEM DESIGN

A system architecture or systems architecture is the conceptual model that defines the structure, behavior, and more views of a system. An architecture description is a formal description and representation of a system, organized in a way that supports reasoning about the structures and behaviors of the system. A system architecture can consist of system components and the subsystems developed that will work together to implement the overall system. There have been efforts to formalize languages to describe system architecture, collectively these are called architecture description languages (ADLs).

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4.1 System Architecture

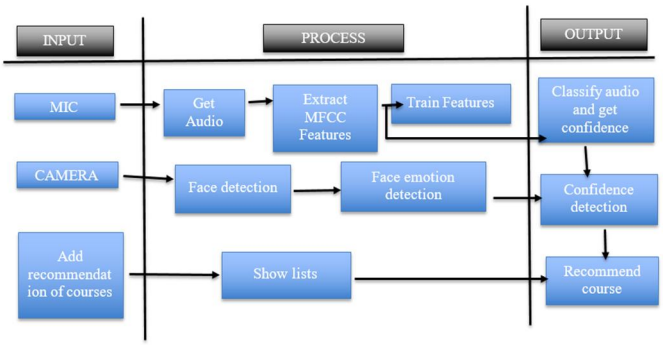

Fig 4.1: System Architecture of confidence detection

4.2 UML Diagrams

This Section content nine UML Diagram, which clearly specify the exact functionality of the prototype and they are as follows:

Class Diagram
State Diagram
Use case Diagram
Activity Diagram
Sequence Diagram
Component Diagram
Deployment Diagram

4.2.1 Data Flow Diagrams:

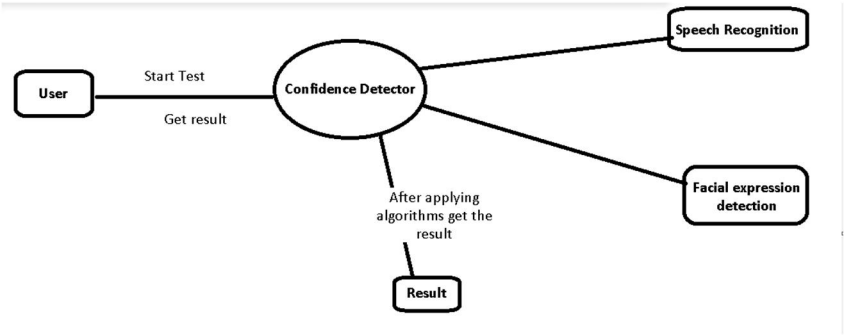

Fig 4.1 DFD Level 0

4.2.2 Class Diagram

The Class diagram shows the seven classes namely User, capture, emotion detection, speech recognition, courses, test data and confidence detection. All classes are related with each other by association relationship. This is how the user is connected with system.

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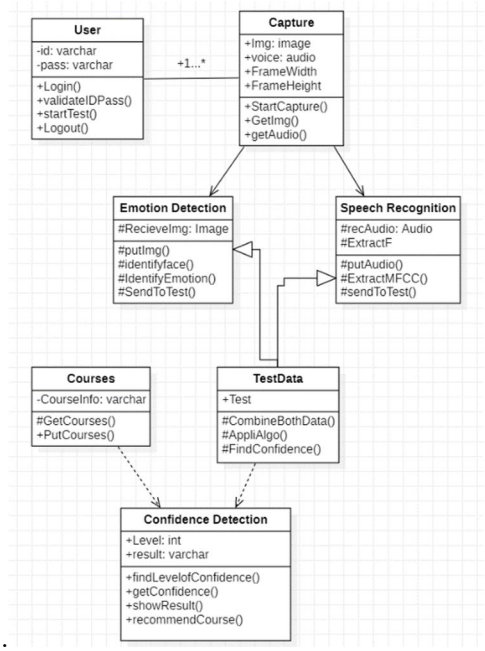

Figure 4.2: Class Diagram

4.2.3 State Diagram

The State diagram shows the overflow of the project. When user open the application the first step is towards Login. Then the user will start the test and finds the level of confidence.

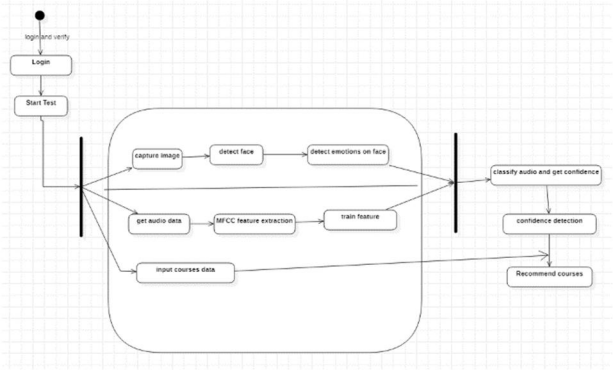

Fig 4.3: State Diagram

4.2.4 Use Case Diagram

The use case diagram shows the actual functionality of system, and how Confidence detection system and users are inter-connected with each other. This diagram gives the exact working of the Confidence detection system.

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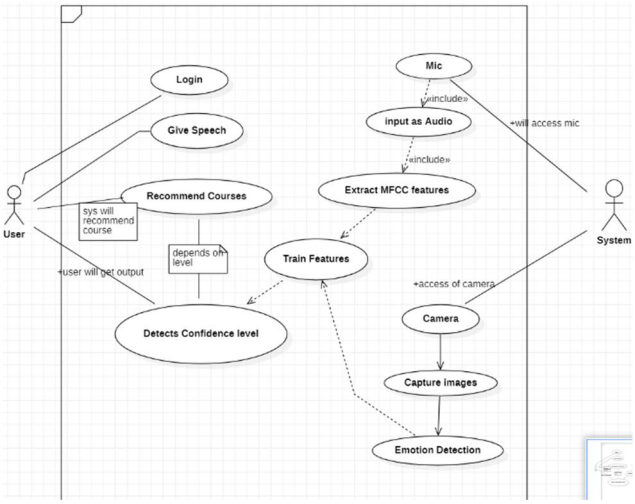

Fig 4.4: Use Case Diagram

4.2.5 Activity Diagram

The Activity diagram shows the overflow of the project. When user open the application the first step is towards Login. If user wants to find confidence of themselves, they have to press start test button and then the test will begin. And confidence will be detected by going through these steps.

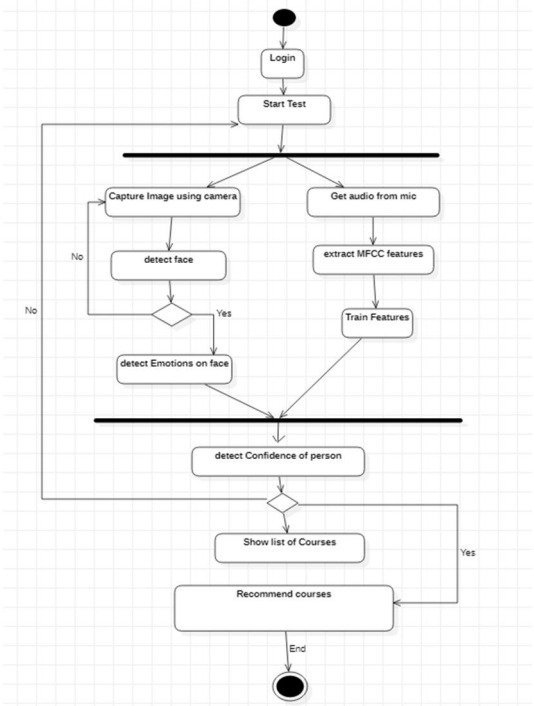

Fig 4.5: Activity Diagram

4.2.6 Sequence Diagram

This system consists of seven name objects namely User, system, mic, camera, speach recognition, emotion recognition and detect confidence.

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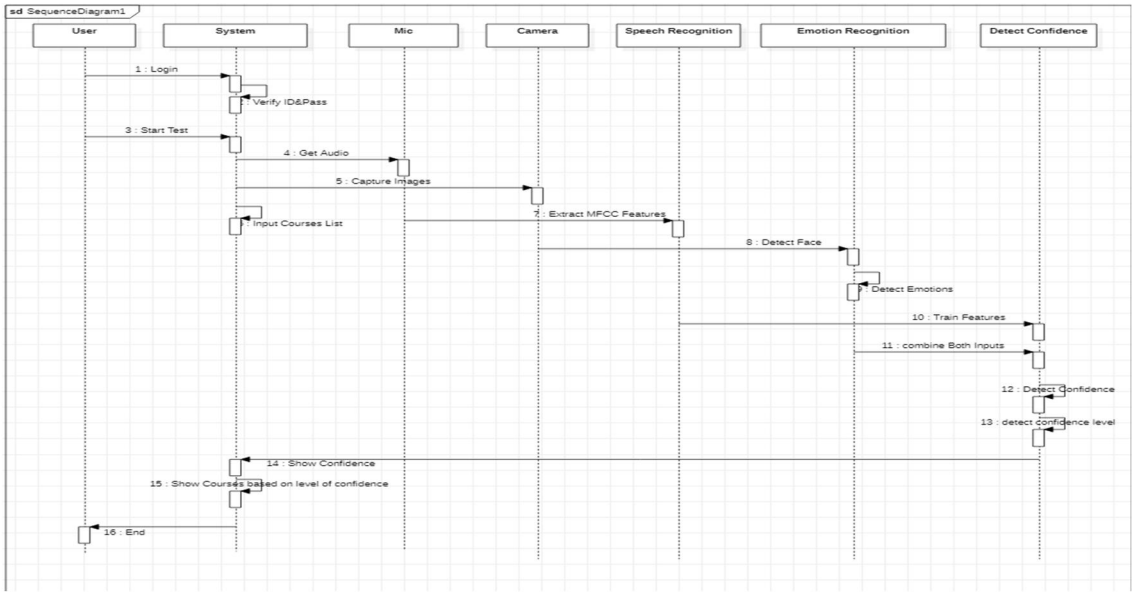

Fig 4.6: Sequence Diagram

4.2.7 Component Diagram

In Component Diagram there are components namely User, mic, camera, MFCC feature extraction, emotion detection, classifying audio, courses, and confidence detection and course recommendation.

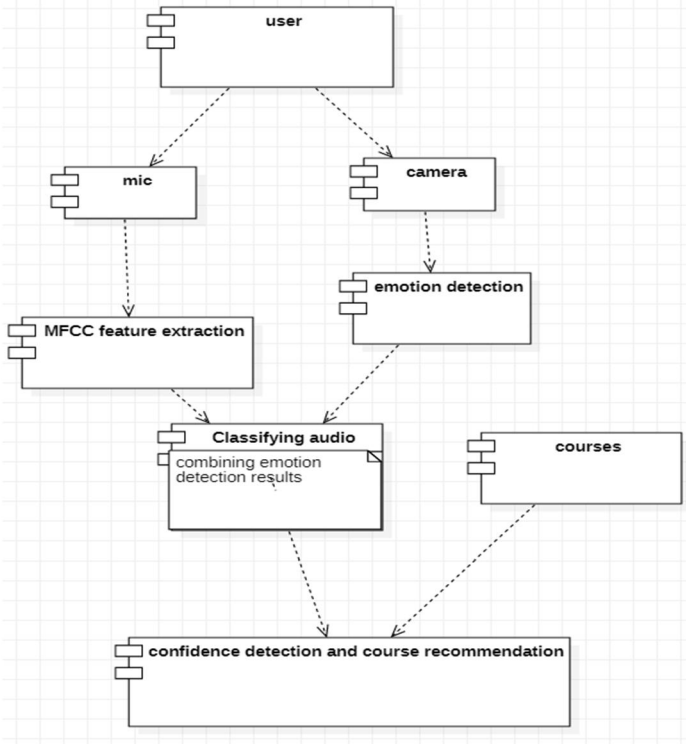

Fig 4.7: Component Diagram

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4.2.8 Deployment Diagram

In Deployment diagram shows database and application connection. All the devices are connected to the database. This deployment diagram shows the hardware requirement of the prototype. How this prototype is working with hardware is the main logic behind the deployment diagram.

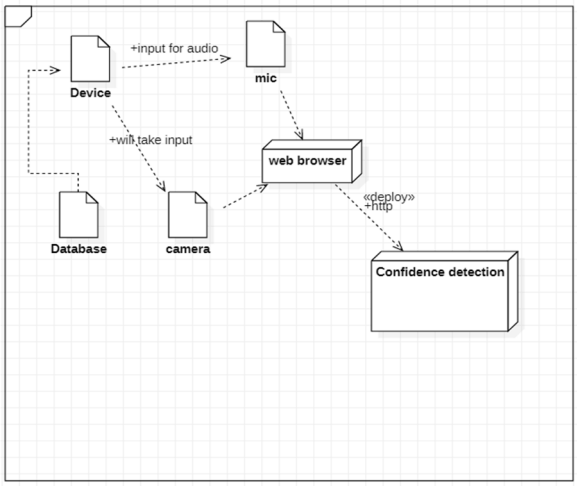

Fig 4.8: Deployment Diagram

V. PROJECT PLAN

In this chapter we are going to have an overview about how much time does it took to complete each task like Preliminary Survey Introduction and Problem Statement, Literature Survey, Project Statement, Software Requirement and Specification, System Design, Partial Report Submission, Architecture Design, Implementation, Deployment, Testing, Paper Publish, Report Submission and etcetera

This chapter also gives focus on stakeholder list which gives information about project type, customer of the proposed system, user and project member who developed the system.

5.1 Team Organization

The Stakeholder list shows the persons who are interacting with the prototype in various roles.

Sr. No.	Stakeholders	Any User of Online Social Network
1	Project Type	Innovative Work
2	Customer	Used for any Schools or Collages.
3	User	Any Organization
4	Project Team Members	Alisha Mane, Dipali Kharat, Kunika Kamlaskar, Snehal Sagar.

Table 5.1: Team Organization

5.2 Project Estimate

The System Implementation plan table, shows the overall schedule of tasks completion and time duration required for each task.

Sr. No.	Task	Start Date	End Date
1.	Primary Survey	02/08/2021	03/08/2021
2.	Introduction and Problem Statement	06/08/2021	10/08/2021

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3.	Literature Survey	13/08/2021	25/08/2021
4.	Project Statement	28/08/2021	30/08/2021
5.	Software Requirement and Specification	31/08/2021	02/09/2021
6.	System Design	04/09/2021	07/09/2021
7.	Partial Report Submission	30/09/2021	10/12/2021
8.	Architecture Design	20/12/2021	27/12/2021
9.	Implementation	20/12/2021	28/12/2021
10.	Deployment	03/03/2022	09/03/2022
11.	Testing	10/03/2022	15/03/2022
12.	Paper Publish	25/03/2022	12/04/2022
13.	Report Submission	25/04/2022	-

Table 5.2: System Implementation Plan

5.3 Timeline Chart

The Timeline Chart of the system shows the schedule and coordinated tasks with in the project implementation span.

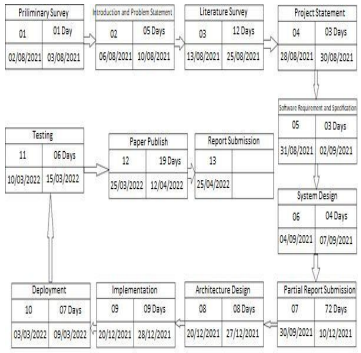

Figure 5.1 Timeline chart

VI. SYSTEM IMPLEMENTATION

6.1 Overview of Project Model

6.1.1 User Login

User will login in the system.

User will be given a paragraph to read or speech on the topic.

6.2.2 Admin Login

Admin will login in the system.

Admin will train features.

6.2.3 System Inputs

System will capture the video and images by the user input.

The audio is taken from the microphone.

The Input courses will be given.

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6.2.4 Internal Process
The Extraction of the MFCC features is taken from the audio.
The Emotion detection will be done by the images and video taken from the user by using CNN algorithm.

6.2.5 Output
The Confidence detection will be done using our provided parameters.
At the end courses will be suggested according to the performance or the results.

6.2 Tools and Technologies Used
Visual Studio 2017
C#
Fire based Database
Dotnet Frameworks
Mic, Webcam
WAVEFORM AND SPECTRUM
CNN Algorithms

Algorithm Details
A Algorithm 1: CNN
There are two main parts to a CNN architecture
• A convolution tool that separates and identifies the various features of the image for analysis in a process called as Feature Extraction.
• A fully connected layer that utilizes the output from the convolution process and predicts the class of the image based on the features extracted in previous stages.

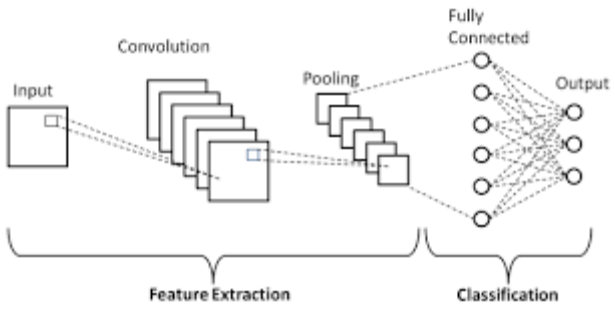

Fig 2.2: Basic Architecture of CNN Algorithm.

Convolutional layers :
In a CNN, the input is a tensor with a shape: (number of inputs) x (input height) x (input width) x (input channels). After passing through a convolutional layer, the image becomes abstracted to a feature map, also called an activation map, with shape: (number of inputs) x (feature map height) x (feature map width) x (feature map channels).
Convolutional layers convolve the input and pass its result to the next layer. This is similar to the response of a neuron in the visual cortex to a specific stimulus. Each convolutional neuron processes data only for its receptive field. Although fully connected feedforward neural networks can be used to learn features and classify data, this architecture is generally impractical for larger inputs such as high-resolution images. It would require a very high number of neurons, even in a shallow architecture, due to the large input size of images, where each pixel is a relevant input feature. For instance, a fully connected layer for a (small) image of size 100 x 100 has 10,000 weights for each neuron in the second layer. Instead, convolution reduces the number of free parameters, allowing the network to be deeper. For example, regardless

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of image size, using a 5 x 5 tiling region, each with the same shared weights, requires only 25 learnable parameters. Using regularized weights over fewer parameters avoids the vanishing gradients and exploding gradients problems seen during backpropagation in traditional neural networks. Furthermore, convolutional neural 5 networks are ideal for data with a grid-like topology (such as images) as spatial relations between separate features are taken into account during convolution and/or pooling.

Pooling layers :

Convolutional networks may include local and/or global pooling layers along with traditional convolutional layers. Pooling layers reduce the dimensions of data by combining the outputs of neuron clusters at one layer into a single neuron in the next layer. Local pooling combines small clusters, tiling sizes such as 2 x 2 are commonly used. Global pooling acts on all the neurons of the feature map. There are two common types of

pooling in popular use: max and average. Max pooling uses the maximum value of each local cluster of neurons in the feature map, while average pooling takes the average value.

Fully connected layers :

Fully connected layers connect every neuron in one layer to every neuron in another layer. It is the same as a traditional multi-layer perceptron neural network (MLP). The flattened matrix goes through a fully connected layer to classify the images.

Dropout :

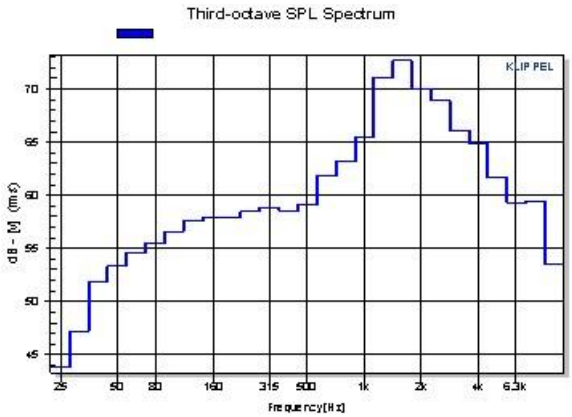
Usually, when all the features are connected to the FC layer, it can cause overfitting in the training dataset. Overfitting occurs when a particular model works so well on the training data causing a negative impact in the model's performance when used on a new data. To overcome this problem, a dropout layer is utilized wherein a few neurons are dropped from the neural network during training process resulting in reduced size of the model. On passing a dropout of 0.3, 30% of the nodes are dropped out randomly from the neural network.

Activation Functions :

Finally, one of the most important parameters of the CNN model is the activation function. They are used to learn and approximate any kind of continuous and complex relationship between variables of the network. In simple words, it decides which information of the model should fire in the forward direction and which ones should not at the end of the network. It adds non-linearity to the network. There are several commonly used activation functions such as the ReLU, SoftMax, tanH and the Sigmoid functions. Each of these functions have a specific usage. For a binary classification CNN model, sigmoid functions.

Algorithm 2:

WAVEFORM AND SPECTRUM



Short-term SPL spectrum with one-third octave resolution measured by using the TRF module.

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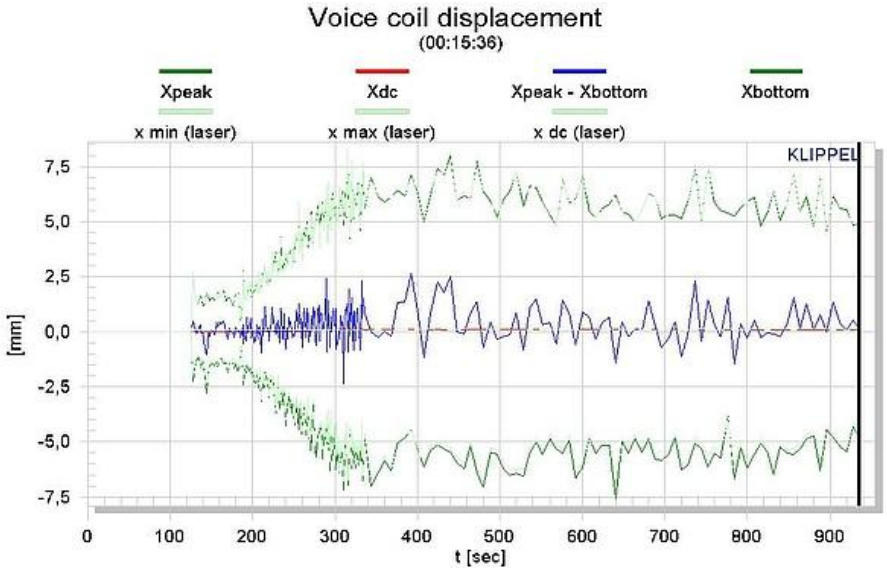
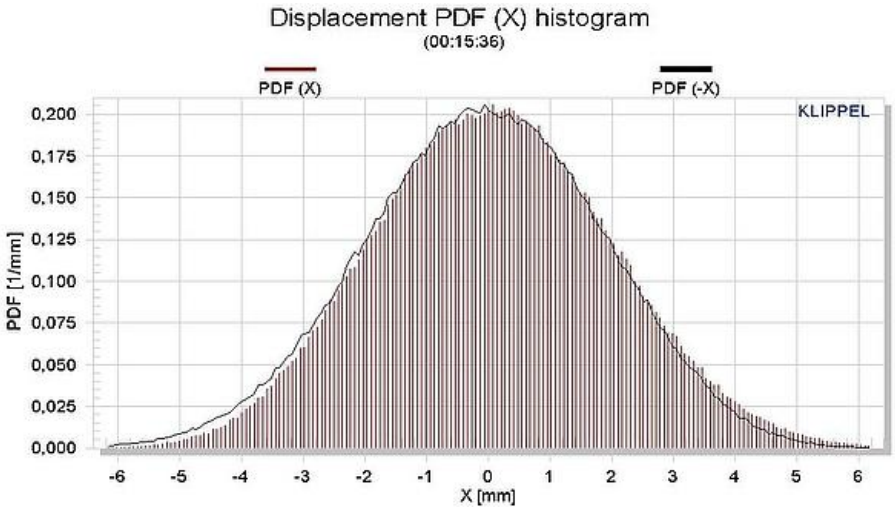
Many modules of the KLIPPEL R&D SYSTEM measure important characteristics of the signal measured by using a sensor or predicted by using a loudspeaker model. Those characteristics can be monitored over time and stored in a history using a stand-alone hardware or a PC.

The rms value is important for calculating power and efficiency but also for assessing the heat dissipation. The peak value is very important for monitoring the voltage at the loudspeaker terminals and for defining the amplifier requirements. The measurement of the negative and positive peak value of the voice coil displacement and its difference is important for explaining nonlinear rectification mechanisms generated by asymmetrical nonlinearities. The crest factor and the probability density function are very useful to describe the audio signals and complex test signals (noise, multi-tone signal). The signal to noise ratio SNR is also a simple and important measure describing the noise immunity of the signal. A spectral analysis applied to the primary measurement signals reveals humming components and other disturbances and the SNR at critical frequencies (for example at very low frequencies).



The figure above shows the peak and bottom displacement measured by the laser sensor and predicted by large signal modeling within the LSI module.



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The figure above shows the probability density function (pdf) of the measured voice coil displacement using audio-like noise signal. Comparing the pdf histogram (brown vertical lines) with the mirrored pdf curve (black line) reveals the asymmetry in the displacement waveform.

VII. SOFTWARE TESTING

In this chapter there is relevant explanation on testing strategies use to test the system, and test cases.

7.1 Types of Testing

Testing Strategy used for testing the system are as follows,

1. Functionality Testing
2. Compatibility Testing
3. Usability Testing
4. Compatibility Testing
5. Performance Testing
6. Security Testing
7. Unit Testing
8. Integration Testing
9. Regression Testing

1. Functionality Testing

As the name implies, the overall functionality of the website must be tested. This includes testing all outgoing links from the website, testing all the internal links and testing links that point to the same page. The main objective is to find any broken links, non-existent pages or orphan pages- pages that do not have any parent pages. Forms on all pages must also be tested – any values that are being typed in by the user must be checked for proper validation. Also, other basic requirements such as setting default values for each field, proper error messages displayed on wrong entry and ability to create/update/delete forms, if applicable, must also be verified.

The tester must also ensure that the cookies can be enabled/disabled. Also, encryption of cookies must be tested. One needs to also delete the cookies and see if security stays intact. Miscellaneous testing with respect to fetching/updating data to the database and HTML/CSS validation must also be done.

2. Compatibility Testing

A website will be accessed over the globe and so its compatibility is of prime importance. The website must be checked for operating systems compatibility, browser compatibility via automated browser testing tools, mobile rowsing and printing options. It also makes sense to test the website's appearance on different inched monitors since there are times when half the content of your website may disappear on small monitors. Also, you may try different font sizes on your website since some users may prefer large font size displays.

3. Usability Testing

Testing for correct navigation within the webpage must be carried out in order to validate proper surfing of the web pages, consistency between various web pages and presence of proper user help at relevant places. Also, presence of content on the pages must be tested for accuracy, logical/structural display, any spelling/grammatical errors and coordinated font sizes/colors. Presence of main menu must be checked on individual pages within the website.

4. Interface Testing

Interactions between web server interfaces and application server interfaces must be tested properly. Also, relevant error

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messages must be shown in case any problem arises during the interactions. Interactions between application servers and database servers must also be checked for correctness. Proper data updates/fetches from the backend database must be validated. Check for proper handling of errors such as maintenance time, accidental/intentional resets and other broken connection between the servers.

5. Security Testing

Internet is where crime rate is on a steady rise, and so the website must be tested for good and strong security in place. Login bypasses must be tested, direct URL modification must be tested, and entry into the website through invalid login details must be tested. Testing must be done to include SQL injection, cross-site scripting, spoofing and password cracking on the website.

6. Performance/Load Testing

Response time and latency during normal hours must be tested on a website. It is extremely important to ensure that the website does not crumble under the pressure of many users browsing it. Tester must ensure that when the maximum number of users that the website can support access the website at the same time, its performance does not deteriorate. Also, when this maximum number of allowed users is exceeded, the website must be tested for proper crash recovery.

Unit Testing

In case of unit testing, each software component, software modules or software subsystemis tested independent of any other components involved in the whole software system. That is individual software modules or software components are tested in unit testing. The main agenda behind unit testing is to verify and validate each and every unit of the software system by checking its working and performance and comparing it with the software specification. The significant control paths are tested and verified to discover errors within the boundaryof the module and the component level design used for the same.

Integration Testing

Integration testing is a kind of testing meant for building the software architecture along with finding out the errors related with the interfacing. After successful execution of unit testing, software subsystem will be collected together and combined together in order to build the whole software system as it is specified and defineat high level design.478 Integration testing is an efficient procedure for verification of the structure of a software system and validation of order of execution of software system while conducting tests to determine errors allied with interfacing.

Regression Testing

During the software development procedure, whenever the software system is modified by means of editing, removing, adding source code, software developers need to be sure that the new version of the software is good as earlier version. Tests that focus on the software modules that have been modified or altered and focus on overall functionality of the software system when the software functions are likely to be affected by the modifications or change.

7.2 Test Cases & Test Results

Test Cases

Login Module

Table 7.4: Test Cases for Login Module

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Sr.No	Test Type	Test Scenario	precondition	Test Case Steps	Expected Result	Result
1	GUI	Verify the GUI Login Page	Launch Browser and open URL	1.check the Spelling, font, alignment, color. 2.Check overall look and feel of The page.	Login Page should Maintain consistency	Pass
2	Positive	Verify the User Login with valid credential	Open URL	Enter Valid User Name and Password credentials in their respective fields.Click on Login button.	Page should nav-igate to the homeuser page	Pass
3	Positive	Verify the Admin Login with ValidCredentials	Open the URL	Enter Valid Admin Name and Password credentials in their respective fields. 2. Click On Login button.	Page should navigate to the adminhome page.	Pass
4	Positive	Verify the Admin Login with ValidCredentials	Open the URL	Enter Valid Admin Name and Password credentials in their respective fields. 2. Click On Login button.	Page should navigate to the adminhome page.	Pass
5	Positive	Verify the User Login with invalid credentials	Open the URL	Enter invalid lo-gin credentials	Page should not navigate to user home page and itshould display the Validation message.	Pass
6	Positive	Verify the Admin Login with invalid credentials	Open the URL	Enter invalid login credentials Username or Password	Page should not navigate to admin home page and it should display the Validation message	pass
7	Positive	Verify the functionality Of the user login page	Open the URL	1. Click on login Link. 2.Enter all the manda Tory fields. 3. Click on" Login	Page should nav igate to the user home page	Pass

Log Out Module

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Table 7.7: Test Cases Log Out

Sr.No	Test Type	Test Scenario	precondition	Test Case Steps	Expected Result	Result
1	Positive	Verify the Logout link.	Click on logout link	Click on logout link.	Page should navigate to the homepage.	Pass
2	Positive	Verify the Functionality of logout link.	Click on logout link.	Click on logout link.	Page should navigate to the homepage.	Pass

VIII. RESULTS

Screenshots

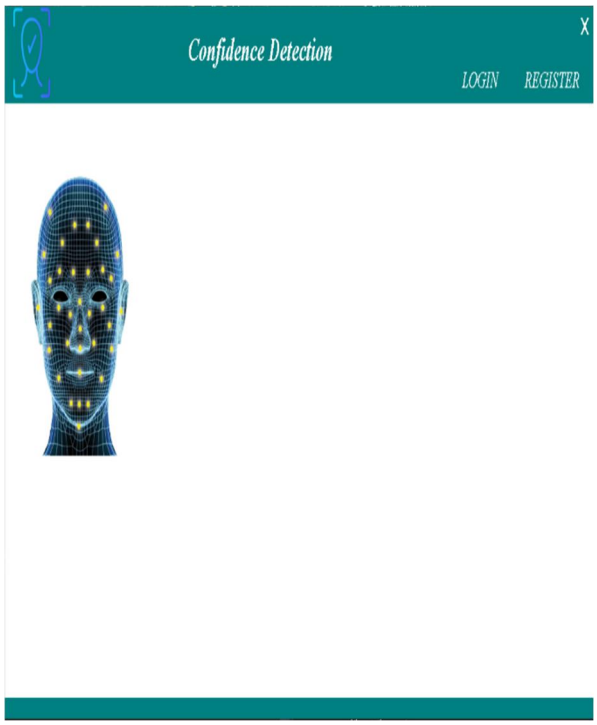

Fig. Index page

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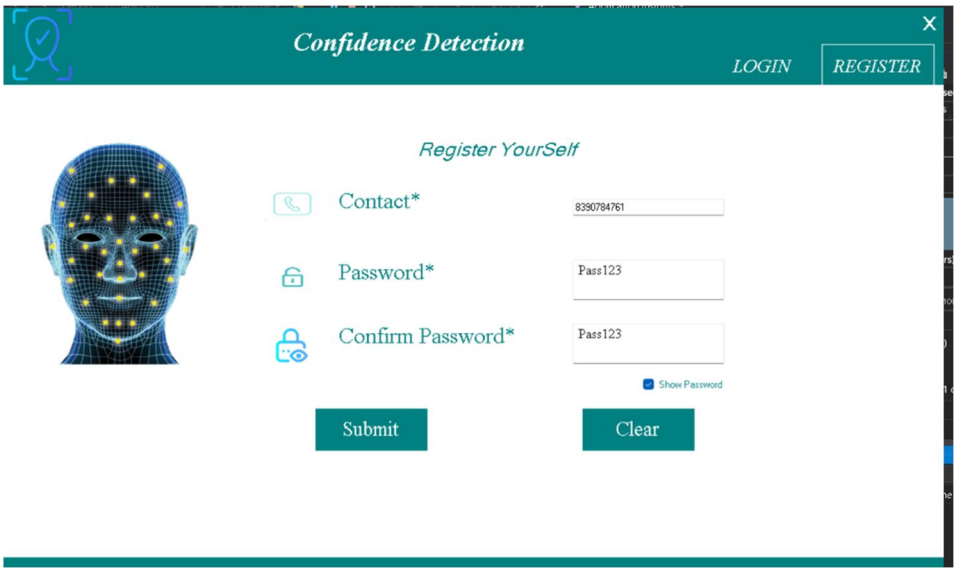

Fig. registration module

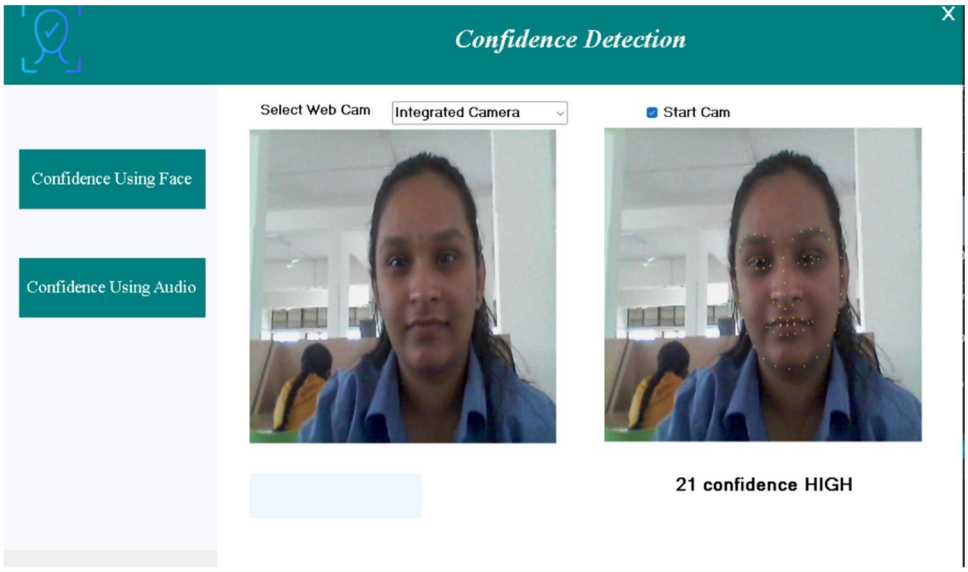

Fig. Face detection module

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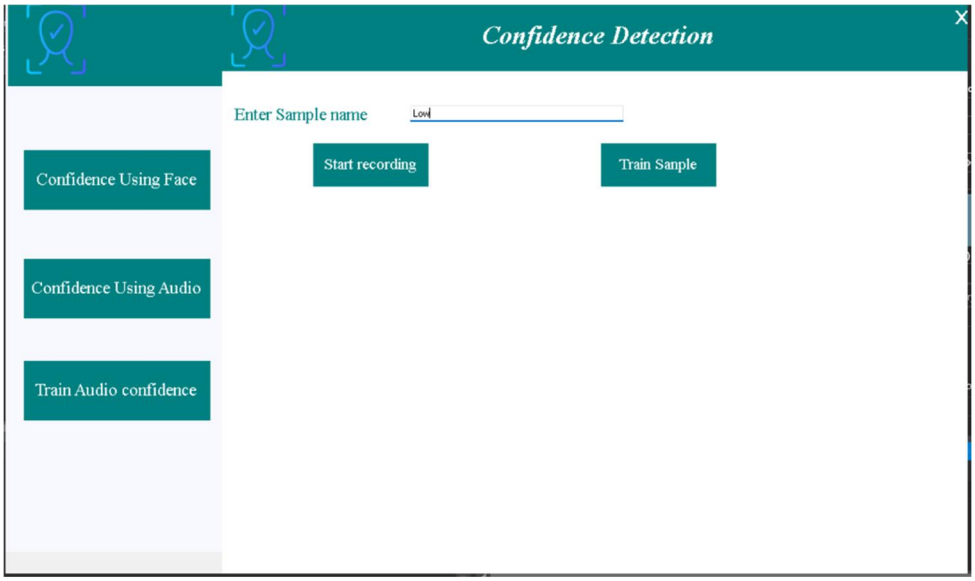

Fig. Admin Feature Training Module

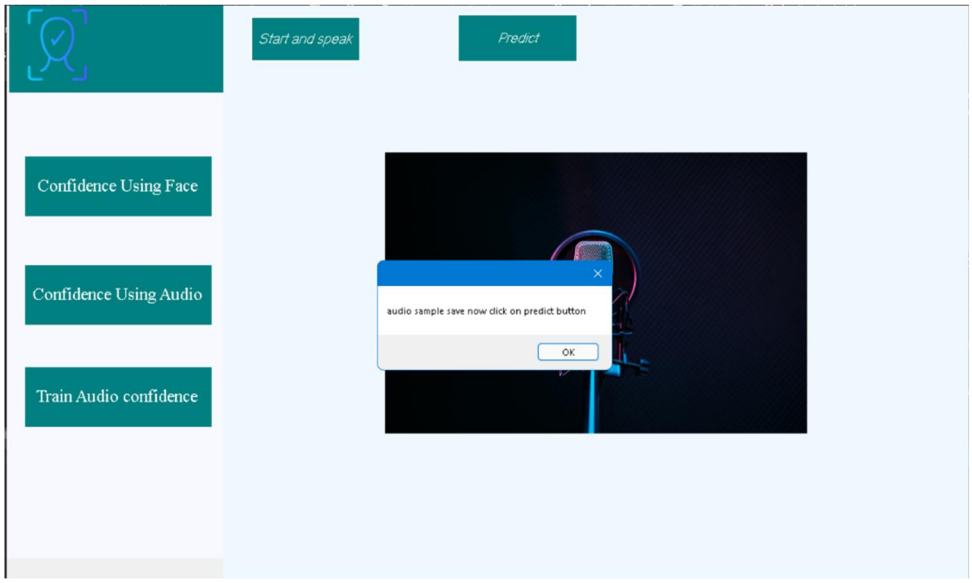

Fig. Speech Module

IX. CONCLUSION

In every field Confidence works a very important role. It is the key to productivity and building a healthy relationship. We will detect the confidence of the person by implementing Face emotion recognition and speech recognition techniques.

The result of the detection will get extracted from live data such as audio and video/images and then as the output, system will tell user whether they are confident or not. For processing the data we are using CNN and WAVEFORM AND SPECTRUM Algorithms for Emotion detection and Speech Recognition. By combining both the input data from the user we will find the confidence based on the given parameters of the user .After generating the result ,the confidence level will be displayed. And then based on result we will recommend the courses or videos or books to the user.

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9.1 Future Work

In future system include plan to install for IP cameras which will pro- duce live images from inside the bus, it will also add speed alert, road change alert, route change notification, smoke sensor, addition of stop- page ID in the entry and exit notification etc. An efficient encryption method will be developed to strengthen security.

1. Speed alert
2. Road changes alert
3. Route changes notification
4. Smoke sensor
5. Addition stop-page ID

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