

SMART ATTENDENCE SYSTEM USING VOICE RECOGNITION

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Logging Attendance has been done manually for a very long time. With the growing technology and speech recognition functionalities, we can make this process more accurate without any wrong or misleading information. It is crucial to have a well-sophisticated attendance tracking system in corporate offices and educational institutions. Also, accessibility of attendance and getting a detailed status has become an essential requirement for everyone in colleges, schools, and offices. Unfortunately, we don't have an efficient attendance system and in this proposed attendance system, we used the speech recognition module proposed by Google in Python to make it intelligent and automatic. Speech Recognition is an interdisciplinary subfield of computer science and computational linguistics that develops methodologies and technologies that enable the recognition and translation of spoken language into text by computers. The proposed system stores the attendance by taking the voice input using App developed with the help of Kivy and provides a user interface to know the detailed status of the employees/students. As there is no possibility of the error except for the google speech recognition API, so a fully working and equipped is 95% accurate according to the Mary Meeker's annual Internet Trends Report which is also the human threshold.

1. INTRODUCTION

We have seen a drastic increase in usage of technology but did not find an accurate and appropriate updated version of the traditional attendance system. We could not have an accessible and integrated user interface for it. It is not viable of not having an attendance system which can provide us the details of each department separately and also of not able to get the details of the status of the attendance of personal attendance. Current way of getting attendance like long queuing is a big disadvantage and has to replace with a handy smart phone where they log their attendance handily. Instead of facing the issues of the attendance machine like maintenance and repair works this is a very feasible way to get the work done by just using a smart phone. This can also overcome the limitations of taking attendance manually like accuracy, accessibility and storage of the data. Also, it saves time. It can also integrate while deciding employee's salary and awarding marks to student. Therefore, this smart attendance system will let logging attendance and storing it in database. A user interface is also developed in order to display the attendance along with many other details like Student personal information, faculty information, subject details and attendance status. The user interface is authenticated with username and password in order to get the information. This can help us getting the information in seconds without any manual work. A speech recognition system is built in the app in order to recognize the audio and log the attendance for the student with that particular roll number. Speech recognition is a technology that can transform audio to text. This has a very less chance of being incorrect. Obviously, this type of setup with a speech recognition system can ripe us many benefits and would help the administration to analyze the attendance in an efficient way. Early systems featured only a single speaker and a small vocabulary of roughly a dozen words. Modern voice recognition systems have large vocabularies in many languages and can distinguish speech from several speakers. Speech is, of course, the first component of speech recognition. With a microphone, actual sound is turned to an electrical signal, which is then converted to digital data with an analog-to-digital converter. After the audio has been digitized, numerous models can be employed to convert it to text.

2. LITERATURE SURVEY AND RELATED WORK

Overview Chapter 2 consists of all theoretical background and literature reviews of speaker recognition. In addition, a review of past method and features of speaker recognition is also included.

Voice Recognition Voice recognition suggests that the computer do not understand it but only can take command and perform it. Comprehending human languages falls under a different field of computer science called natural language processing. Nowadays, a lot of voice recognition systems are available. The most powerful one can recognize thousands of words. Traditionally, voice recognition system only used in a few specialized situations because of their limitations and high cost. As the time goes on, the cost decreases and performance improves, speech recognition systems are entering the mainstream. For example, voice recognition is used as an alternative to keyboards. These systems are useful in instances when the user is unable to use a keyboard to enter data because his or her hands are occupied or disabled. Instead of typing commands, the user can simply speak into a headset. Speaker recognition is a biometric modality that uses an individual's voice for recognition purposes. It is a different technology than speech recognition, which recognizes words as they are articulated from. Speech recognition is not a biometric. The speaker recognition process relies on features influenced by both the physical structure of an individual's vocal and the individual's behavioral characteristics. This project will concentrate on speaker recognition.

Speaker Recognition Speaker recognition is divided into two which are verification and identification. Speaker verification is used to validate a person's claimed identity from his voice. Many terms which has the same meaning with speaker verification is usually used. For example, voice verification, speaker authentication, voice authentication, talker authentication and talker verification. A person can make an identity claim with the help of other source. For example, by entering an employee number or presenting his smart card. (Reynolds, 2008) In the other hand, speaker identification means there is no prior identity claim and the system decides who the person is, what group the person is a member of or that the person is unknown.

In a simple word, speaker verification is defined as deciding if a speaker is © 2016 Global Journals Inc. (US) Volume XVI Issue Version I 2 (G) Global Journal of Human Social Sciences - Year 2016 Development of Voice Recognition for Student Attendance who he claims to be. This is different from the speaker identification problem.

3. EXISTING SYSTEM

The Automated Attendance System and Voice Assistance is one among the image processing systems. According to base paper the algorithm of Convolutional neural networks evinced to have low computational complexity and SVM algorithm proved to be less efficient. The difficult task in this system is face recognition and also the accuracy rate is low. A facial feature can be used in the different computer vision algorithms like face detection, expression detection and many video surveillance applications. Recently, face recognition systems are attracting researchers toward it. This approach has three different methods such as SVM, CNN and KNN and it has been presented. For SVM and MLP based approach, the features are extracted using PCA and LDA feature extraction algorithms. In KNN based approach, the images were directly feed to the KNN module as a feature vector. The proposed approach shows the good recognition accuracy for KNN based approach. The SVM, CNN and KNN achieves the testing accuracy around 88%, 95% and 97% on self-generated database respectively.

By this service the ambulance may not require the third person to indicate the address on their own. This approach is explained clearly

4. PROPOSED SYSTEM

This Smart Attendance System is the combination of a Mobile Application and a Web Application. Speech Recognizer is used to recognize the voice inputs, capture the input records, and then we log them into a database. The exact architecture is shown in fig.2. A. Speech recognizer Fig 1 is the is a Speech Recognizer. MFCC is Mel-frequency cepstral coefficients that extracts the important features from the audio input based on amplitude, pitch etc. It converts audio, that is analog signal to digital. Mel spectrum is group of all the Mel-frequency cepstral coefficients. Mel spectrum is used for making the proposed speech recognition more efficient. Google web speech API uses MFCC. In the application developed we used Google Speech Recognizing API to recognize the voice inputs from user. The voice taken from the user is run through a python code where the imported python modules like Speech recognizer are used to analyze the inputs taken, convert them into digital form in which the machine can understand, apply the appropriate algorithm, and change the voice to text file. This text data is used to store the appropriate attendance data into the database

5. METHODOLOGIES

MODULE

Data set Creation

First step in every voice system is the enrolment of a person using general data like their name and their unique voice features as templates. A dataset of student is created with their names and unique id. The dataset has been trained and stored in newly created folder with their required names. Voice is captured from the mike and then student voice is detected. After the voice is detected, that voice features are processed

Sound Recognition

When executing the python file on instruction, the PC will ask speaker's name and training GMM model for them in any case speakers' voice are imported. And after training process completed, the PC can test the speaker who's now speaking. Using mel-frequency cepstral coefficients: the most important thing to know about speech input is that the sounds generated by an individual are filtered by the form of the vocal movement including the movement of tongue, lips etc. This shape determines what sound comes out. Packages of spectrum of short time power are made and therefore the job of MFCC is to accurately represent this package. In learning, we take out features of human voice and build models for every person. The elements we used here are called Mel-Frequency Cepstral Coefficients (Abbreviated as MFCCs) and therefore the model we build for each and every person is named gaussian mixture model. (Abbreviated as GMM). These two models train the data accurately and make it ready for testing. The testing time is efficient and mostly depends on the hardware being used.

6. RESULTS AND DISCUSSION SCREEN SHOTS

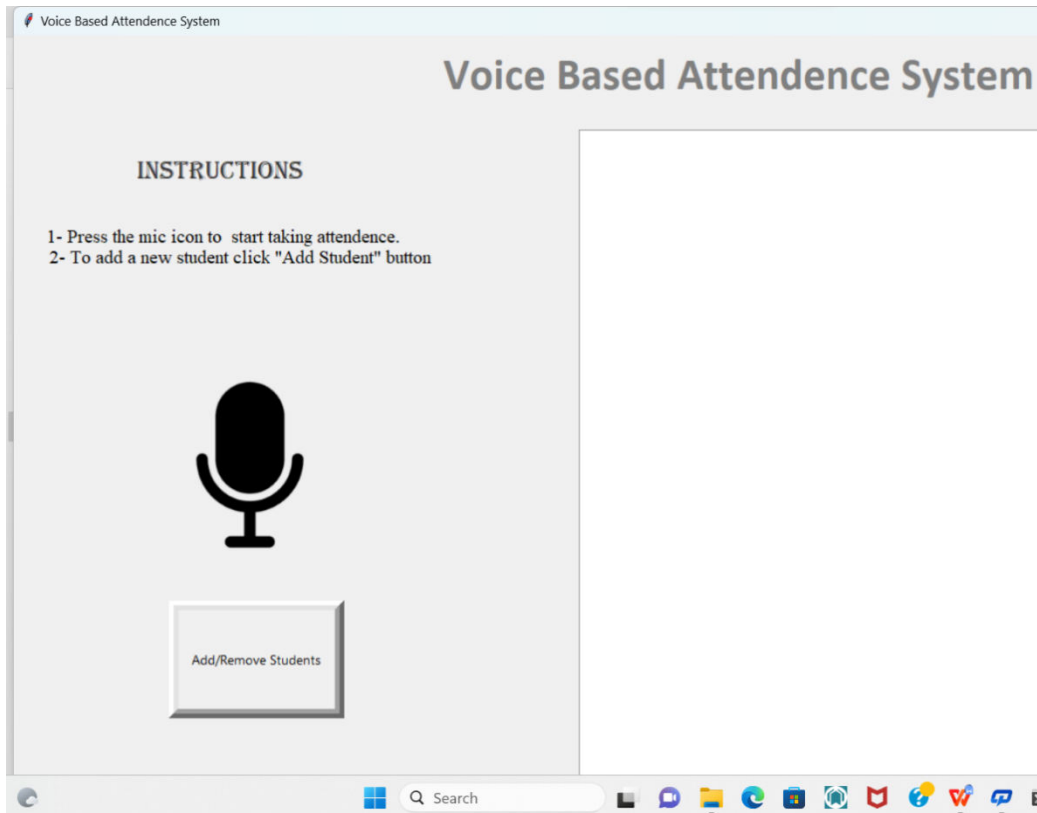


FIG1- HOME SCREEN

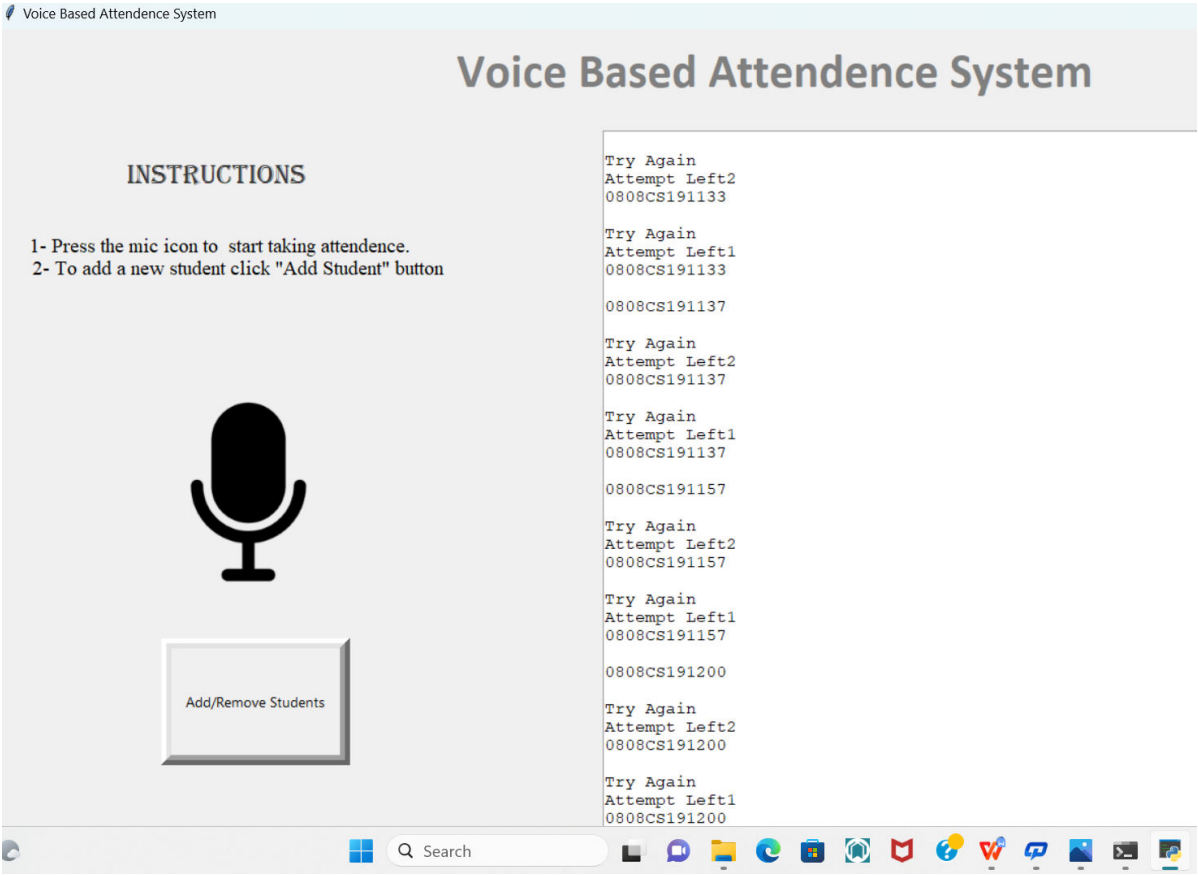


FIG 2- ATTENDANCE RESPONSE SCREEN

Index	Enrollment	SE Number	Name	Status
0	0808CS1911	33	Piyush Jaisw	0
1	0808CS1911	37	Pradyumn G	1
2	0808CS1911	57	Rick Bukhar	0
3	0808CS1911	200	Virendra Ca	0

FIG3- ATTENDANCE RESPONSE SCREEN

7. CONCLUSION AND FUTURE SCOPE

Manually taking attendance is the traditional way. It takes a long time and is insecure, making it inefficient. Instead of taking student attendance manually, Smart Attendance employing a speech recognition technology is a more efficient way that saves time for teachers. Its ability to take attendance for each person based on their vocal input simplifies and speeds up the procedure when compared to the traditional way. Students must provide voice as input; if any invalid input is recognized, attendance will not be recorded due to authentication failure. As a result, we were able to achieve our desired outcomes with the help of an automatic attendance system, saving a significant amount of productive time. We don't even need any unusual hardware to carry out this procedure. This strategy simplifies attendance management and ensures that attendance is taken accurately. Students, faculty, and administrators can use the website we built to view student attendance based on numerous filters such as a specific class, a specific subject, a certain date, a specific student, and so on. The website allows for simple attendance tracking as well as less paperwork, which saves time and money. It generates several forms of class or student attendance reports automatically. It protects users' privacy by giving them permissions based on their roles.

Its capacity to individually identify each person based on their voice input can be expanded further, making the process of granting secure access easy, faster, and more secure than the traditional technique. This can be expanded and utilized in a variety of departments. It would be beneficial to management, for example, in determining professor compensation based on

attendance. It could also be beneficial in government workplaces with many elderly staff. They can utilize this model for attendance even when they have lost their fingerprints. We can also expand it by creating a smartphone application for employees and a PC application for administrators. The date, time, unique number of Android systems, smartphone number, and GPS (Global Position System) coordinates will be communicated to the database server via the smart phone, along with the employee's fingerprint. Before delivering the information, the employee must first log in to their account. Voice recognition or fingerprint recognition can be used for the login or authentication procedure.

8. REFERENCES

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