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Automated Attendances System Using Face Recognition with the Help of Machine Learning

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Abstract: Internet are the things discover and it is used all over a world very beneficially in human body face is the crucial factor for identifying each person. It can be identified By using different method like biometric for taking attendance. But in this method takeMany more time are required to take attendance and also people are in contact With Each other while marking their attendance in this pandemic situation we are introducing New technology student attendance system using face recognition. They can identify the Face and detect in webcam and live video stream and automatically mark the Attendance generally in a classroom the attendance was taken manually at ending or Beginning of the class. The problem is that they required a lot of time to be taken and Some manual and paper work will make a chance of mistake. To overcome from this problem We are introducing face recognition base attendance system. Face recognition is a Methodology in which person or group of person can be identify from digital image orLive stream video. We are introducing the new technology the automated attendance System using face recognition in this method we are used fisher igen algorithm, face Detection, cnn, knn, and fisher face to detect the face in camera and recognized person Mark the attendance and store in the form of excel sheet. All the data are stored in firebase Cloud we are access date wise data with the help of authorized person. Attendance are stored in excel sheet .it can implemented easily have good accuracy.

Keywords: - Face recognitions, Face detection, Haar classifier, CNN, KNN, SVM, LBPH, fisher face detection, fisher egien, image processing Automated attendance, Webcam, image dataset.

Introduction:- Face recognition is a methodology in which person or group of person can be identify from Image or live stream video. They can identify a person from given dataset image And they compare extracted human facial feature from input image of human face and They recognize uniquely by investigating the texture pattern and shape of the person face Through face reorganization which identify faces and save record in the form of excel sheet Attendances is the part of daily life for educational intuition as well as management System.in previous year the attendance can be taken manually they required lot of pen And page with time. Or they pass sheet to sign one by one to maintain their record. But Now a days many more technology are introduced to reduce time and work like this we Given the student attendance system using face recognition, they taken Attendance automatically to reduce the complexity and to prevent the chance of mistake. This are the advantage for educational as well as official sector. In the pandemic situation we are giving the automated attendance system for educational As well as management purpose we are creating face base attendance for student as well As teacher it automatically detect face in webcam and mark their attendance in the form Of excel sheet Google firebase is used to store the record of attendance it can be access Only authenticate person and date wise data can be obtain in firebase in web ui part. Hence the attendance record can be access and there is no waste of page and pen and Chance of make mistake is also avoid and time is save.The system can be implemented in any sector which required to make presence of Employee, student or management staff it can be implement easily .have a good accuracy.

Modules and overview of system:-

1. Student login in excel sheet
2. Make dataset
3. Face dataset training
4. Face extraction and detection
5. Mark the attendance in excel sheet
6. Attendance access with the help of firebase.

The main purpose of this system to detect the student face and taken the attendance Automatically, with saving time and also reduce the chance of mistake it save money also and Pen as well as paper can save manual work can be reduced we have collected different Posture of image an individual with high accuracy and then the image train from input Dataset it recognize the image for this we used adaboost algorithm, proposed algorithm, cnn, Knn and face detection algorithm, fisher Eigen, fisher face are used. The image Recognized correctly then it mark the attendance in the form of excel sheet. The image Are collected and stored in the folder give the name of folder according the name of Individual all the image are stored in that folder and give number sequence wise for Training the image have high accuracy and it can be detect easily with the help of fisher Eigen algorithm the detected face mark the attendance manually. After making dataset the Training of dataset is dome the unwanted or blur image can be remove and pure data is Provided for training with its sequence number and the training is done with the help Of face detection and Eigen and lbph algorithm. The extraction of image data can be Take place dataset is extracted in webcam with the help of different algorithm and it detect The face in webcam and identify the person in webcam they detect their name and id.While Entering the data in the excel sheet the name and id are provided to the person while Detecting that id and name is automatically detect in the window of screen and the Attendance are stored in excel sheet. The attendance are available date wise in the firebase Cloud and they can be downloaded when we need the attendance can be access only Authorized person while logging in the firebase we have need password and username to Access the data of attendance. [1, 5]

Component used:-

1. Python
2. Opencv
3. Webcam
4. Fisher Eigen
5. Fisher face
6. firebase
7. Student Dataset and Algorithm
8. Haar classifier ,KNN,CNN,SVM

Design Aim: The main purpose of this system to detect the student face and taken The attendance automatically, with saving time and also reduce the chance of mistake it Save money also and pen as well as paper can save manual work can be reduced .the System can be implement anywhere at System and they can be design for teacher and student for saving the time, paper And no mistake can be occur at the time of attendance.

Methodology:-

The various stage can be occur in it they are as follows which help to build project.Data Entry

1. Make dataset of image
2. Stored the dataset in folder

3. Dataset Training
4. Face Recognition
5 Attendances Entry
6. Stored date wise attendance in Google firebase.

Data entry: the collected image can be stored in the separate folder which is train sequence Wise given number and the name, roll no, are enter in the excel sheet previously. The Folder are created and store the image with high accuracy in that folder. We used different Type of image with expression and posture in dataset folder the image with sect and Without sect are stored in that folder. Make dataset of image: the image are train and Stored in folder with sequence number blur and unwanted image are remove from dataset And the image resize in 100*200 and stored in thee dataset folder The resize image are train using fisher Eigen algorithm and lbph algorithm After training the face is recognize in the webcam, and detect that face show their name And roll no, the person is recognized and stored the attendance in the form of excel sheetThe date wise attendance are store in firebase the pc is not able to store such a large Amount of data hence we are use Google cloud for storing large amount of data. The attendance are store in it and access by authorized person only.

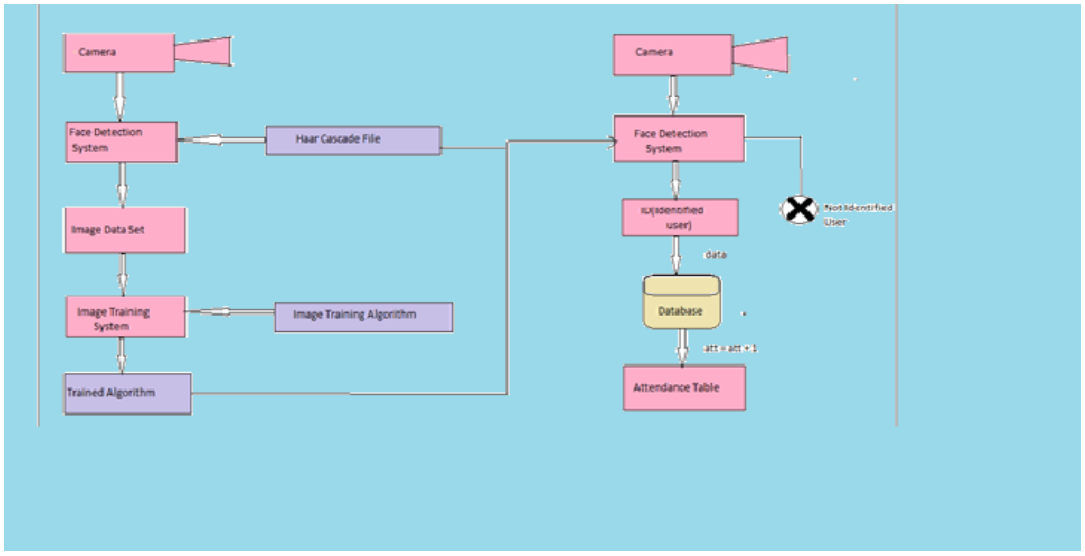
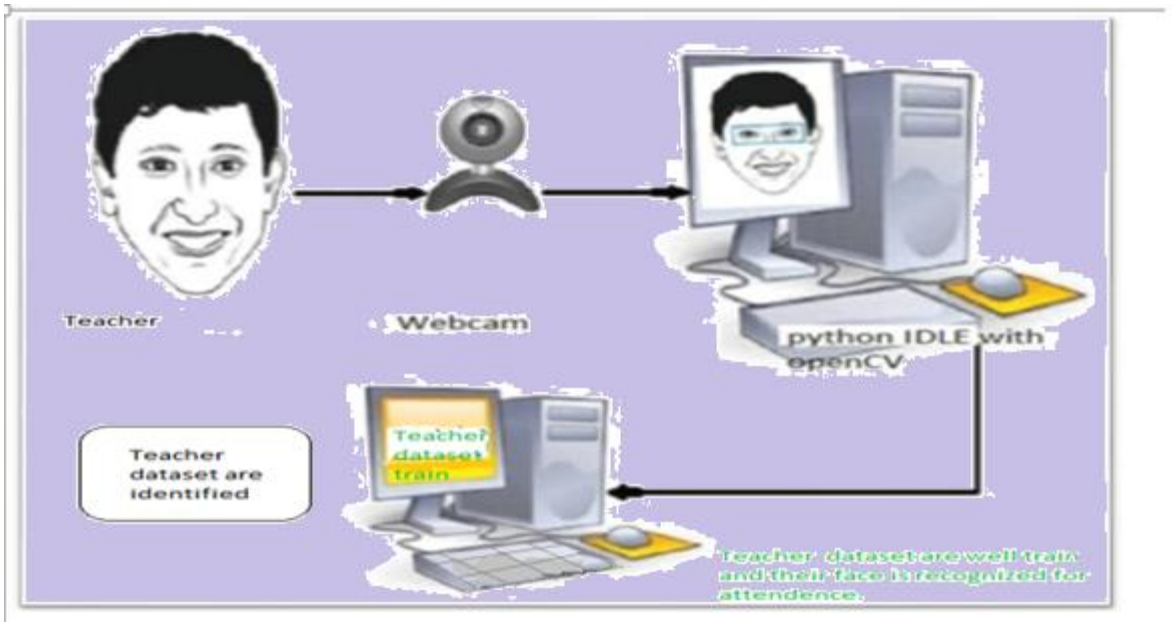


Fig.1:- Face Recognition

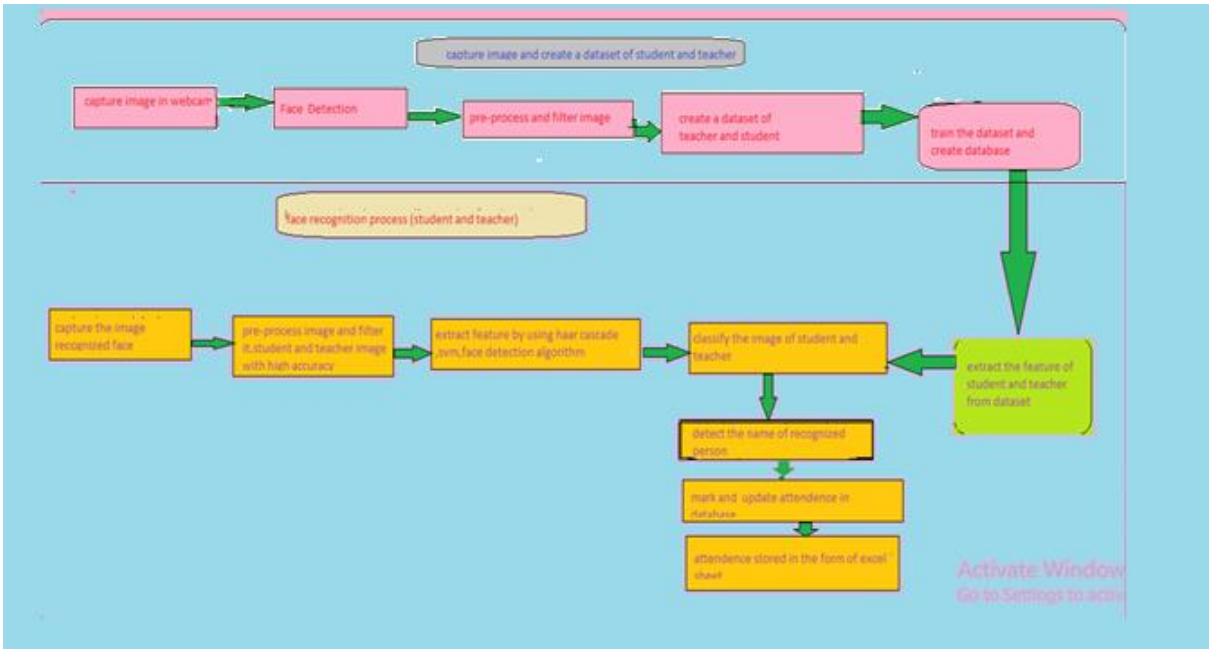
The above flowchart show how the face are recognized in the camera and training of student Dataset using different algorithm and by using haar cascade algorithm is done all feature Are extracted and the data are stored in database attendance is mark and stored in excel Sheet on firebase. [6, 9]

Architecture of the system:

Face detection and attendance entry of student



Attendance for management using webcam



The overall process for attendance system of student and faculties

The given dataset are stored in a folder with their name, roll number and branch the Dataset are used as input when student are in live video stream identify student with Their name and roll no, attendance can be taken automatically within 2 sec and Attendance stored in the form of excel sheet. The given dataset are focus on How

face recognized and detect the authorized student and Count at what time they are Coming In and going out from classroom and also record.

Algorithm Used:

1) Convolutional Neural Network (CNN): A Convolutional Neural Network is a deep learning algorithm which can take in an input image, assign importance to various
Aspects Objects in the image and be able to differentiate one from the other.

2) Support Vector Machine (SVM): Support Vector Machine is supervised Machine learning algorithm used for both classification and regression purpose. It identify the faultless dataset and classify them into the image which is recognized.

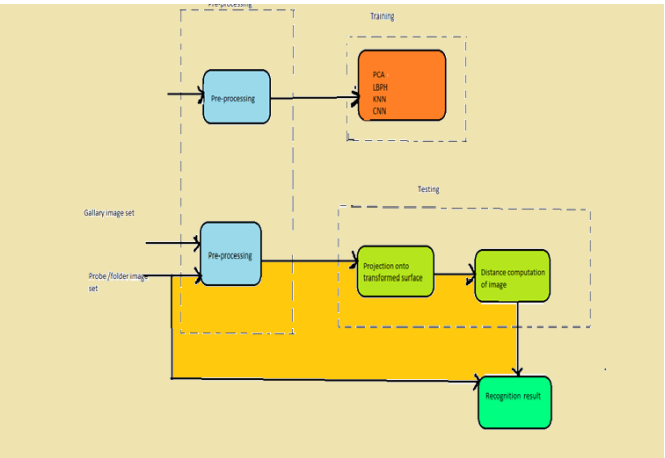
3) Local Binary Pattern Histogram (LBPH): Local Binary Pattern Histogram represents local feature of the image. It gives more accurate result of face detection &recognition Verification

4) Identification can be done using LBP histogram that represent face image with a simple Data vector. It can be used for Face Recognition task which is perform step-by step. It convert facial features into pixel [100*100] threshold it and convert into binary. Later, it can be converted into decimal and the complete feature of the image can be identified perfectly.

5) Face Recognition and Face Detection Algorithm: The face capture in the Webcam with ideal with different expression on the face. It can be done in real- time and also by storing the image with their name and ID. The face are recognized well and detect the Face in webcam with their name and ID.

6) Eigen Faces: This is statistical plan method. The characteristics which influence image is derived by this algorithm. The whole recognition method is depend on training of dataset which will be provided.

7) Fisher Faces: It follows the progressive approach like Eigen Faces. It use the same Principal component analysis like Eigen. It differentiate one faces to others by their Name and ID.

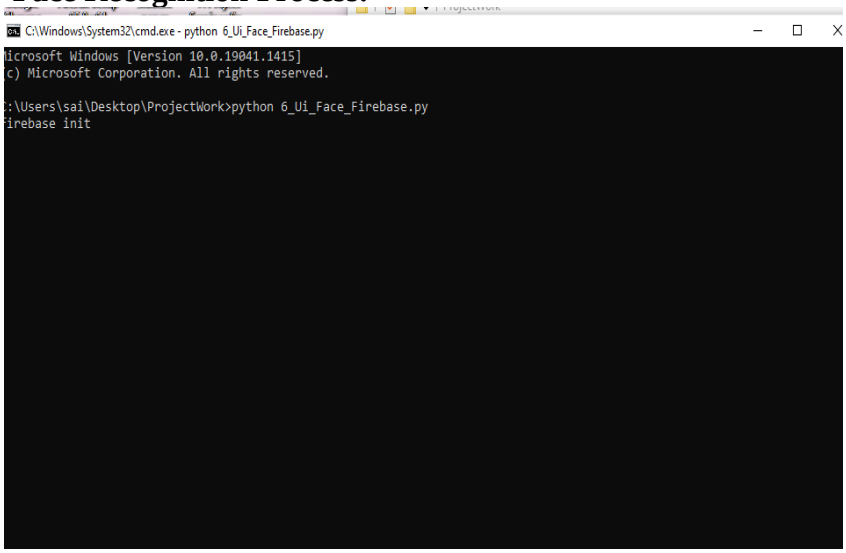


Algorithm used for processing of image while training of data.

Face extraction and detection

The face extraction is the process in which the face are locate by extracting their structural feature.It is first train as classifier and then it check the variability present across human faces such as pose,expression,position,and orientation, skin color, the presence of glasses or facial Difference In camera gain lighting condition and image resolution. Face detection is the first and essential step for face recognition, and it is used to detect face recognition and it is used to detect face in the image it is a part of object detection and can use in many area such as security, bio-metric, law enforcement personal safety.

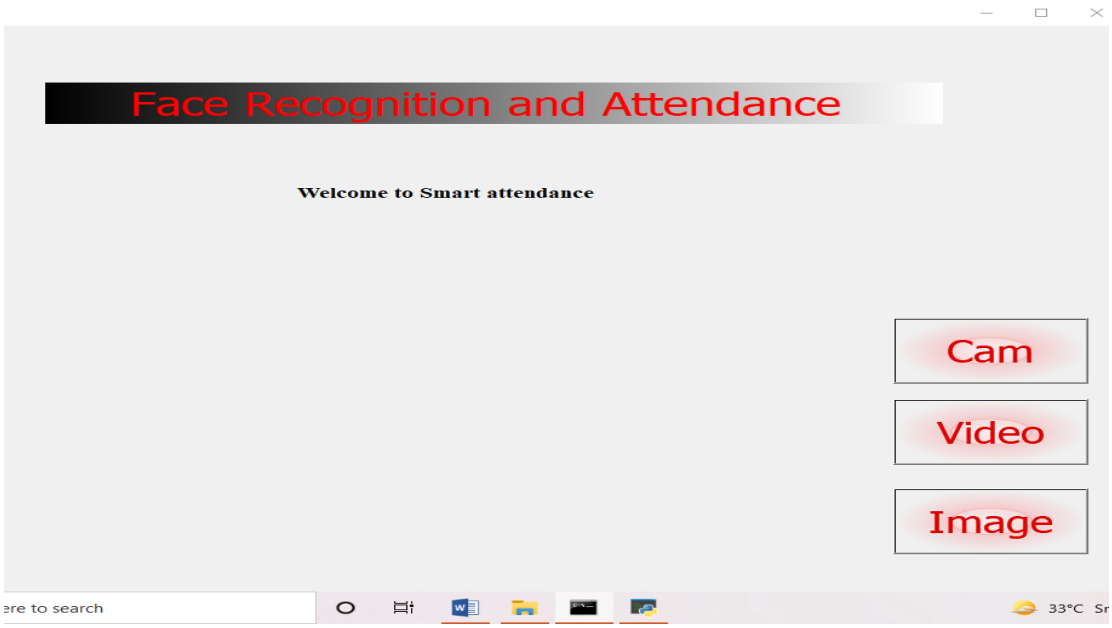
Face Recognition Process:



Execution process:

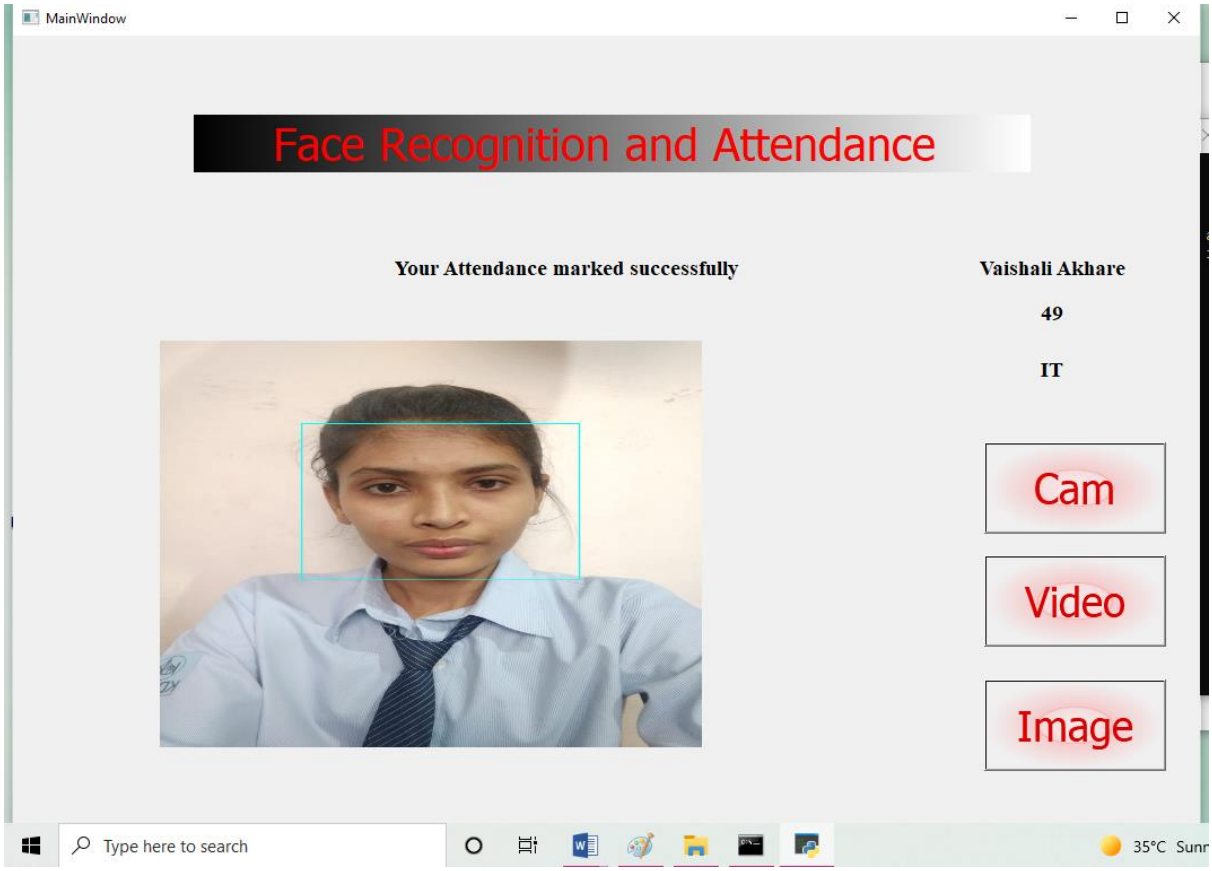
First the student of image is collected with different posture having high accuracy then the collected image are stored in the given database with their roll number, name and branch the separate folder are created for student image then student can registered or sign in in the form to stored their name and roll no, branch registered student can recognized while training of image take place in recognition phase unregistered student cant not recognized by system. The unauthorized person cannot access the detail. This is security to the system, the register student can recognized and attendance will be mark it store in the form of excel sheet. [3]

Main window of camera:

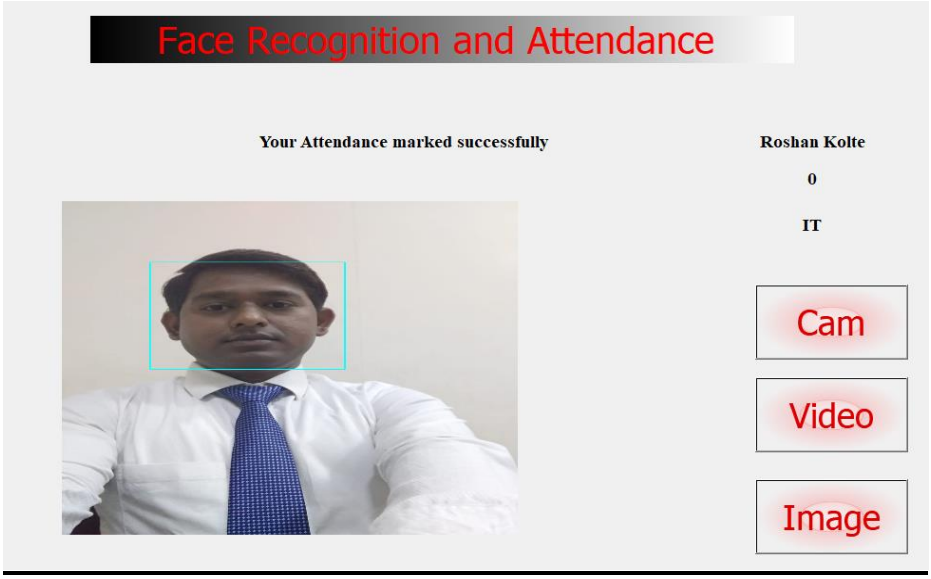


Window to detect face in camera, video and using image.

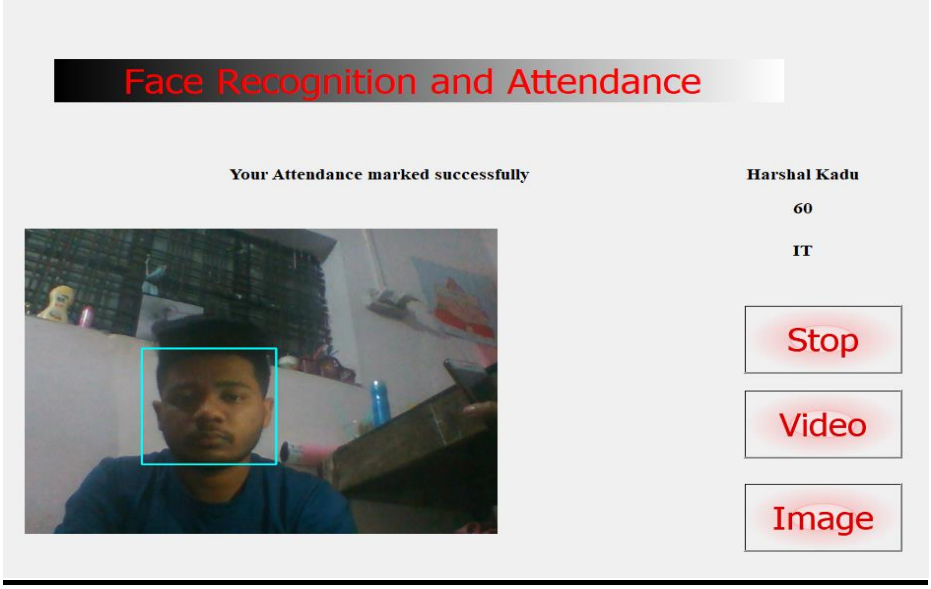
Face Detection Process using camera:



Face detection process using image:

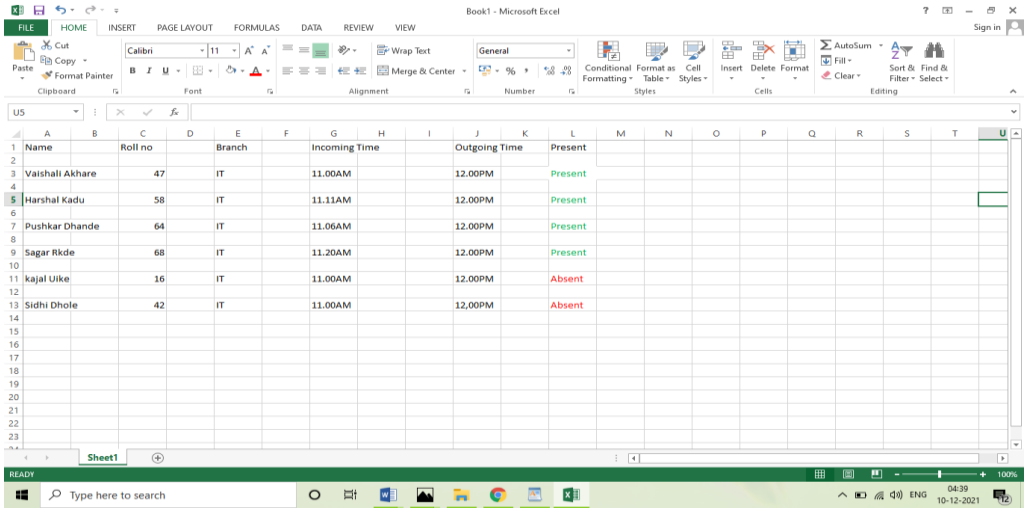


Face Detection Process Using video:



The Attendance can be mark after detecting a face in webcam and store in the database in the form of excel sheet detecting name and roll no and branch with incoming and outgoing time and mark the attendance in excel sheet.

Attendance mark in Excel sheet:-



Name	Roll no	Branch	Incoming Time	Outgoing Time	Present
Vaishali Akhare	47	IT	11.00AM	12.00PM	Present
Harshal Kadu	58	IT	11.11AM	12.00PM	Present
Pushkar Dhande	64	IT	11.06AM	12.00PM	Present
Sagar Rkde	68	IT	11.20AM	12.00PM	Present
kajal Uike	16	IT	11.00AM	12.00PM	Absent
Sidhi Dhole	42	IT	11.00AM	12,00PM	Absent

Firebase cloud: - Firebase is a Google backed application development software that enables developer to develop web apps when your application require a minimal level of integration with legacy system or third party services, Firebase will be the right choice. Firebase also becomes an ideal choice when your application does not require heavy data processing or any form of complex user authentication requirements. How it is work: The firebase real-time database lets you build rich, collaborative applications by allowing secure access to the database directly from client-side code. It authentication user login and identity real-time database Are store in cloud firestone. How the data stored in it:- Firebase authentication take care of getting your users logged in and identified. This product is essential To getting some of the other products configured properly, especially if you need to restrict access to per-User data the login data of user is stored in the firebase by creating the account in the cloud firebase This information are safe to store and use only authenticate person. How to extract the attendance from firebase in the form of excel sheet:-The attendance data are stored in firebase safely and it can access only authenticate user to extract the data we need login id and password for the accessing data. The attendance data is stored in the form of excel Sheet. Authenticate person can access it other person can't access information from firebase. The attendance is the excel sheet format which include name, roll no and time and date this can access the student data.

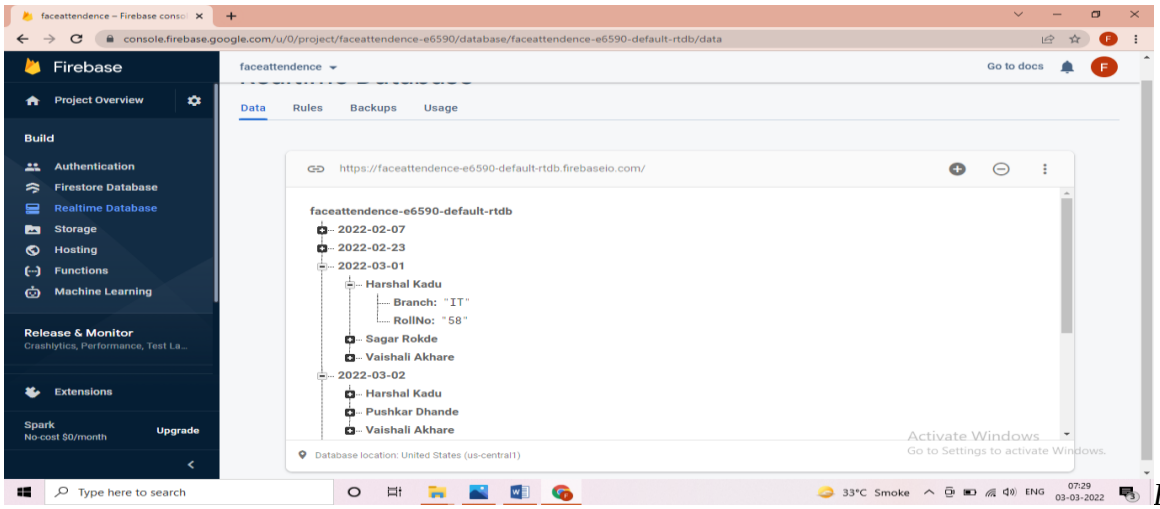


Fig: firebase to store the data of attendance date wise

Conclusion

The system provide the feature such as face detection, extraction of feature, detection of extracted feature and analysis of student's attendances. It recognized students face and detect their face attendance mark using name and id and store in the form of excel sheet.it helps to build effective class attendance Using face recognition system.

Future Scope:

An automatic attendance system is an educational system that record the attendance of students in college or school. Attendance software enables the faculty to record, Store, and monitor students' attendance history and manage the classroom proper it saves lot of time, pen, paper and it avoid the chance of mistakes in attendance. Data are save private and no can do the changes in it hence it is more secure.

Advantages:

It is Time saving process

It is easy to manage and more secure

It is cost effective

Attendance can mark automatically

Time and date also automatic track.

Disadvantages:

If it goes in wrong hand it will make a problem.

Data privacy breach

Low reliability

Lack of regulation in face recognition system

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