IJCRT.ORG ISSN : 2320-2882

INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

ATTENDANCE SYSTEM USING FACIAL RECOGNITION

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Abstract: The face is an important part of the human body, it recognizes people in huge gatherings. The recognition of face has gained the attention of many researchers and has subsequently become the standard benchmark in the human recognition space. An attendance system using facial recognition is a type of biometric technology. It identifies and verifies the identity of a person from a digital image. Accurate attendance records are critical to class evaluation. However, manual attendance tracking can lead to errors, missed students, or duplicate records. A class image is taken and the RECOGNIZER python file is run. Attendance is done by cropping the faces in the image and it is comapared with the database faces.

Keywords: Python; OpenCV and Google API; Student attendance; Face recognition

I. INTRODUCTION

The application is the development of a attendance system using facial recognition that aims to automate the attendance process in schools, colleges and workplaces. This project focuses on implementing a face recognition attendance system using Python and OpenCV. OpenCV (Open Source Computer Vision Library) is an open source that provides various tools and algorithms for image processing and computer vision tasks. Key components of this system include face detection, attendance using recognizing the face .The detection of face is performed using a cascaded Haar classifier that detects the presence of faces in the image. Once a face is detected, facial recognition is performed using a pre-trained deep learning model such as the FaceNet model to identify the individual. Finally, the attendance the attendance is marked and stored in the database.

II LITERATURE SURVEY

1. In the modern era, educational establishments place greater emphasis on student attendance, as it is crucial for the quality of education. , but, however, traditional methods of marking attendance, such as calling names or taking signatures on paper, are time-consuming and tedious. A project named "Student Attendance System Using Python Based on Facial Recognition" was created to transform this system. The project employs the computer systems camera to take a picture of the student, which is then analyzed by an algorithm to identify the students face. the attendance is automatically recorded and the attendance record can be extracted in the form of an Excel sheet after successful face recognition. Python Tkinter was employed to develop the GUI for the system, with the aim of making it more user-friendly. This cutting-edge system streamlines processes, minimizes work, and decreases the chances of mistakes in attendance monitoring. This system is a notable advancement compared to conventional

techniques and can substantially enhance the productivity of educational establishments.

2.The introduction of automatic face recognition (AFR) technology has brought about significant changes in various areas of our evolving society. This technology has practical use in student attendance systems. A facial recognition attendance system employs face biometrics and high-definition monitor video to identify students faces for attendance tracking. For my face recognition project, I will employ deep learning to create a computer system that can rapidly and precisely identify and locate human faces in images or videos recorded by a surveillance camera. I will be utilizing deep learning to transform video frames into images that can be effortlessly analyzed and employed to automatically update attendance databases, despite the existence of numerous algorithms and techniques for enhancing face recognition performance. The use of face recognition technology can greatly enhance the accuracy and efficiency of attendance-taking in educational institutions. Attendance System using Python at JETIR October 2020.

3.The human face is a unique and important part of the body that can be used as a biometric identifier to perform facial recognition. Attendance registration is an important task for every organization and the traditional process can be time-consuming and tiring. In this project, we propose a face recognition method based on OpenCV that integrates a camera to capture input images, an algorithm to detect faces from image input, facial coding and recognition, and signatures in presentations and PDF-converted signatures. The training database of the system is created by training the process using the faces of authorized students. Cropped images of students' faces and their writing are stored in the database. Local binary pattern histogram (LBPH) algorithm is used to capture image features. After the training, the system can instantly recognize the authorized student's face. When the camera detects the student's face, the system compares the visible face with the face in the database. If a face is found, it will be marked as present on the student attendance sheet. If the face cannot be recognized, the system will mark the student as absent. Participation documents can be exported as PDF files for easy storage and distribution. The planning process is more efficient and accurate than the engagement process, making it a useful tool for any organization.

2.1 Outcome of Literature Survey

The literature survey for the attendance system using facial recognition project indicates significant advances in the recognition of face technology and shows its wide use and potential. Despite its advantages, issues such as privacy concerns, algorithmic bias, and accuracy under different conditions remain. Existing systems demonstrate the feasibility and effectiveness of using facial recognition for attendance tracking. Future research aims to increase accuracy, address privacy issues, and explore new applications. The survey highlights the importance of understanding these aspects for the successful implementation.

III PROBLEM STATEMENT

Traditional attendance systems are often cumbersome, relying on manual entry or card-based systems that can be error-prone, time-consuming and require physical contact. It is important to be more efficient, accurate and contactless solution for tracking attendance in various environments such as schools, businesses and events. The challenge is to develop a the recognition of face that can accurately identify individuals, record their attendance and seamlessly integrate with existing systems while addressing privacy concerns and ensures compliance with data to be protected. This system should be cost effective, easy to use and portable as well.

IV OBJECTIVES

1. Face segment detection from a video frame.
2. To get unique and distinct features from the detected face.
3. Train the data(images).
4. Mark the attendance in the database.

v METHODOLOGY

3.1. Cmake

It can generate a native build environment that can build libraries, compile source code, create wrappers, and build executable binaries and store user-editable data before generating native build files. This feature offers users flexibility and control over the build process, making it easy to edit and customize the build environment as needed.

3.2. Dlib

Dlib is a widely-used C++ library that specializes in machine learning, computer vision, and computational geometry. Its extensive set of tools and algorithms includes features for facial recognition, facial landmark detection, object detection, and clustering. Dlib is highly regarded for its efficiency and is commonly employed in both research and production environments. Additionally, Dlib offers Python bindings, enabling Python developers to leverage its capabilities. If you're developing a attendance system using facial recognition using Python and OpenCV, Dlib could be a valuable resource, particularly for tasks such as face detection and facial landmark detection.

3.3. Face Recognition

It is a process in which the face captured is marked with the face which is stored in the database.If the face is matched with any of the faces in the database the face is detected and displays the name corresponding to the face registered.Once the face is recognized then the attendance is marked for the current day with timings.

3.4. OpenCV

Computer vision and machine learning applications can be done with OpenCV, a free and powerful software library. The software provides users with access to over 2,500 highly efficient algorithms that can be utilized to accomplish a diverse range of tasks, such as identifying similar images within an image. this sentence is paraphrased as: OpenCV has been downloaded over 18 million times and is widely used by developers who want to add AI to their products. this sentence is paraphrased as: The tools adaptability and extensive capabilities have made it a favored choice for various computer vision and machine learning tasks in numerous sectors.

3.5. Google API

Google Cloud Platform (GCP) offers several APIs for various services, including the Vision API. The Vision API can detect objects, faces, and landmarks in images, as well as read and extract text. It also offers safe search detection to filter inappropriate content. Additionally, GCP provides the Natural Language API, which can analyze text for sentiment, entities, and syntax. These APIs enable developers to add advanced machine learning capabilities to their applications without needing to build and train models from scratch. Integration is straightforward, making it easier to leverage Google's AI and machine learning technologies in your projects.

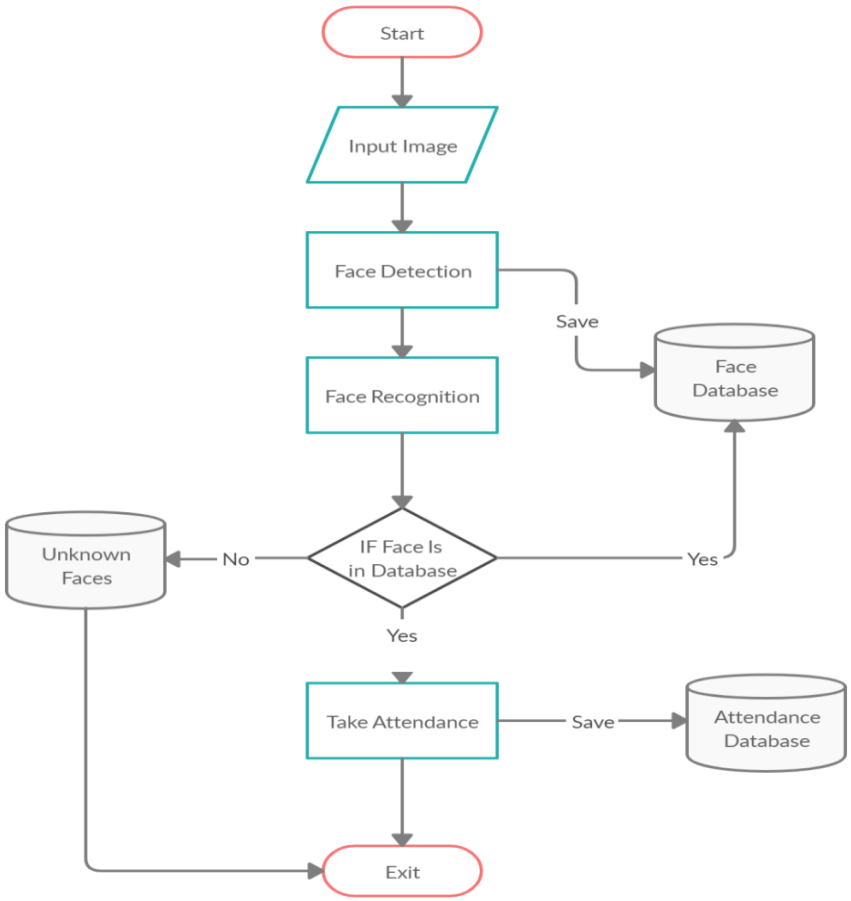
3.6. Google Sheets API

The Google Sheets API is a RESTful interface used to read and modify spreadsheet data. Common uses include loading cell values, updating cell data, and creating new sheets. Creating tables Input and output values of table cells.

3.7. Work flow

It involves collecting data from classmates and using it as input for recognizing the face project. The project requires the installation of certain software, which is explained in the documentation.When the project is complete, OpenCV activates the camera and captures real-time images of faces as input.The python package is used to recognize the faces in the input image and the faces are stored in the python array.The face recognition process generates a face encoding and compares it to a known python array of students. If a familiar face is detected, it is saved to a local CSV file. The goal of the system is to store attendance data for free a cloud resource for which the Google API is used. The Google Sheets API is linked to Google Sheets and the key file is generated to connect a Python project to the Google API. Data is stored in a Google Sheets document with username and time and data is cleared every day. The attendance list is downloaded every day for later usage and a local backup is also created for that day. When the system starts up the next day, all detected faces are recorded in a new CSV file with the date of that day as the file name.

VI FLOWCHART



ADVANTAGES/DISADVANTAGES/APPLICATIONS

Advantages:

✓ **Accuracy**: Facial recognition systems can accurately identify individuals, reducing the chances of errors in attendance tracking.
✓ **Convenience**: Users can check-in without needing physical cards or devices, making the process more convenient and efficient.
✓ **Security**: Facial features are unique to individuals, making it difficult for others to impersonate someone else.
✓ **Automation**: The system can automate attendance tracking,It saves time by reducing the physical process of human.

Disadvantaes:

✓ **Privacy Concerns**: During Training the data.
✓ **Cost**: Implementing facial recognition systems can be costly, including the initial setup and ongoing maintenance.
✓ **Accuracy Issues**: Factors like lighting conditions and facial expressions can affect the system's accuracy.
✓ **Security Risks**: Like any technology, facial recognition systems can be vulnerable to hacking or unauthorized access.
✓ **Regulatory Compliance**: It ensures compliance with data protection regulations, such as GDPR or CCPA, can be challenging.

Applications:

- Used in institutes.
- It can be very useful for the employees in the company.

CONCLUSION

Implementing an attendance system based on facial recognition technology offers many benefits. It provides a convenient and efficient way to track attendance, discarding the need for manual processes and reducing the risk of errors. These are also more secure than traditional methods, as they can accurately verify the identity of individuals based on their unique facial features. Additionally, these systems can be integrated with other technologies, such as cloud storage and data analytics, to further improve their functionality and usefulness. Overall, leveraging this management can streamline operations and improve overall efficiency in various settings, including schools, businesses, and organizations.

Future Scope

The scope of this project includes accurate attendance tracking by registering users through facial features, facial detection and recognition, ensuring high accuracy and security, integrating with other systems, providing reports and analytics, scaling for large numbers, offering user friendly environment and possibility of customization. It should seamlessly handle registration, check-in and access to attendance records while being adaptable to the needs of the organization. The system design should prioritize accuracy, security and compliance and offer a robust attendance management solution through recognition of face technology.

REFERENCES

[1] Patil, S., Khot, P., Jamadar, N., Mane, H., & Gadkari, S. Student Attendance using Python. (2020)

[2] Chandramouli, B., Yalamanchili Vijaya Venkata Satya Avinash Kumar, Chikkala Venkata Lakshmi, Golthi Bapanayya Harish, and Pattan Abdulla Khan. "Face Recognition Based Attendance System Using Jetson Nano." Int. Res. J. Mod. Eng. Technol. Sci 3, no. 8 (2021).

[3] Face Detection Using Haar Cascade,Towards Data Science-727f68dafd08,Girija Shankar Behera,India,Dec24,2020.[Online].Available:https://towardsdatascience.com/face detection with-haar-cascade727f68dafd08.

[4] Sample, Ian. "What is facial recognition-and how sinister is it." The Guardian, July 29 (2020).on.

[5] MRusia, Mayank Kumar, Dushyant Kumar Singh, and Mohd Aquib Ansari. "Human face identification using lbp and haar-like features for real time attendance monitoring." In 2019 Fifth International Conference on Image Information Processing (ICIIP), pp. 612-616. IEEE, 2019