Detection of Fake Attendance Using Eye Contact

Ishwari Gavade[1], Sharvari Kudal[2], Nirjala Lokhande[3], Gauri Dhole[4]

[1] Dept. of Electronics & Telecommunication Engineering, Jaihind Polytechnic Kuran, Pune, India
gavadesishwari@gmail.com
[2] Dept. of Electronics & Telecommunication Engineering, Jaihind Polytechnic Kuran, Pune, India
sharvarikudal@gmail.com
[3] Dept. of Electronics & Telecommunication Engineering, Jaihind Polytechnic Kuran, Pune, India
nirjalokhande@gmail.com
[4] Dept. of Electronics & Telecommunication Engineering, Jaihind Polytechnic Kuran, Pune, India
gauridhole2508@gmail.com

ABSTRACT-

In colleges, universities, organizations, schools, and offices, taking attendance is one of the most important tasks that must be done on a daily basis. The majority of the time, it is done manually. such as by calling by name or by roll number. The main goal of this project is to create a Face Recognition-based attendance system that will turn this manual process into an automated one This project meets the requirements for bringing modernization to the way attendance is handled. As well as the criteria for time management This device is installed in the classroom, where and student's information, such as name, roll number, class, sec, and photographs, is trained. The images are extracted using Open CV. Before the start of the corresponding class, the student can approach the machine, which will begin taking pictures and comparing them to the qualified dataset. Logitech C270 web camera and NVIDIA Jetson Nano Developer kit were used in this project as the camera and processing board. The image is processed as follows: first, faces are identified using a Haar.

Keywords— Face Detection, Face Recognition, Haar Cascade classifier, NVIDIA Jetson NanoA.

INTRODUCTION

A system utilizing eye contact analysis can enhance face recognition based attendance systems to detect and prevent proxy attendance, a common issue where one person attends for another. This approach leverages computer vision techniques to not only identify individuals but also assess their attentiveness and engagement with the camera. By analyzing subtle changes in eye gaze, pupil dilation, and other visual cues, the system can determine if the detected face genuinely belongs to the person intended to be present. In academic and corporate environments, accurate attendance tracking is essential for evaluating performance, ensuring accountability, and maintaining discipline. Traditional methods, such as manual sign-ins or RFID cards, are vulnerable to manipulation and proxy attendance. Biometric systems have improved reliability, but even these can be bypassed in some cases. With the advancement of computer vision and machine learning, there is growing interest in more intelligent and secure methods of attendance verification. One promising approach is the use of eye contact detection to verify genuine presence and attentiveness. Eye movements and gaze patterns can provide strong cues about whether an individual is actively engaging with a session or merely present in the frame to fake attendance. By analyzing eye contact data through video monitoring and advanced algorithms, it becomes possible to differentiate between real and fake attendance with higher accuracy. This project aims to explore the feasibility and effectiveness of using eye contact and gaze tracking as a means to detect and prevent fake attendance, ensuring a more trustworthy and intelligent attendance system. Detecting fake attendance is crucial for maintaining integrity and accountability in both educational and professional settings. Traditional attendance systems are often susceptible to manipulation, such as proxy attendance or simply being physically present without paying attention. These loopholes undermine the purpose of attendance tracking, leading to inaccurate assessments of participation, engagement, and performance.

Eye contact detection offers a more reliable and intelligent   method of verifying genuine presence. By analyzing eye movement and gaze direction, the system can determine whether an individual is actively engaged or merely trying to appear present.

LITERATURE SURVEY

S. Lukas, A. R. Mitra, R. I. Desanti and D. Krisnadi,"Student Attendance System in Classroom Using Face Recognition Technique," in ICTC 2016, Karawaci, 2016.
Described:

Authentication is one of the significant issues in the era of information system. Among other things, human face recognition (HFR) is one of known techniques which can be used for user authentication. As an important branch of biometric verification, HFR has been widely used in many applications, such as video monitoring/surveillance system, human computer interaction, door access control system and network security. This paper proposes a method for student attendance system in classroom using face recognition technique by combining Discrete Wavelet Transforms (DWT) and Discrete Cosine Transform (DCT) to extract the features of student's face which is followed by applying Radial Basis Function (RBF) for classifying the facial objects. From the experiments which are conducted by involving 16 students situated in classroom setting, it results in 121 out of 148 successful faces recognition. **N. M. Ara, N. S. Simul and M. S. Islam, "Convolutional Neural Network Approach for Vision Based Student Recognition System," in 2017 20th International Conference of Computer and Information Technology (IC- CIT), 22-24 December, 2017, Sylhet, 2017.**

Described:

The automatic face recognition system is one of the most significant research attentions in recent years. Face recognition technology has become an important tool in different applications such as access control, forensic analysis, and identity verification, It can match a human face from a digital image against a database of faces. This system is employed to certify users through ID verification services. This system was started developing in the 1960s, started as a form of Computer application. Since their beginning, facial recognition has become one of the most used technologies . These days, face recognition is used on smartphones, also used in industries to confirm the identity. In biometric face recognition technology uses computer algorithms to analyze and identify one's unique facial features. The process of face recognition basically goes through capturing an image of a person's face, extracting unique features from the image, and comparing those features with a database of shape of the jawline, the size of nose, the contours of face etc. As technology grows, attendances are stored in a database with security. All the information concerning the students is kept within the database. So that Manual attending can be replaced by the RFID.

P. Wagh, S. Patil, J. Chaudhari and R. Thakare, "Attendance System based on Face Recognition using Eigen face and PCA Algorithms," in 2015 International Conference on Green Computing and Internet of Things (ICGCloT), 2016. Described:

This work presents a study on the sensitivity of bare fiber Bragg grating (FBG) to detect ultrasonic frequencies under various temperature. Two infrared (IR) laser with excitation wavelength, $\lambda=1310$nm and $\lambda=1550$nm were employed. Various types of FBG with operating wavelength of 1546nm, 1550nm and 1554nm were used to identify the optimum design of sensor in detecting range of ultrasonic frequencies between 5kHz until 30kHz under various surrounding temperature from 20°C until 30°C. The principle of FBG vibration detection lies in the fact that spectral shift would occur due to the acoustic-induced variations in the medium. In this study, the ultrasonic signal had been investigated by monitoring the amplitude of optical output power. At 30°C, the bare FBG with operating wavelength of 1554nm using 1310nm light source exhibits the optimum performance in detecting ultrasonic vibration Frequency, in which its sensitivity was obtained as $\Delta P=0.10$dBm. We believe that the sensitivity of the proposed sensor can be enhanced by introduce nano materials onto the FBG or by altering the physical structure of FBG. Attendance of students in a large classroom is hard to be handled by the traditional system, as it is time-consuming and has a high probability of error during the process of inputting data into the computer. This paper proposed automated attendance marking system using face recognition technique. The system deployed Haar cascade to find the positive and negative of the face and eigenface algorithm for face recognition by using python programming and Open CV library. The proposed method using PCA to resolved the problems such as lightning of the images, noise from the camera, and the direction of the student faces. The attendance of the student was updated to the Excel sheet after student's face has been recognized.

K. Goyal, K. Agarwal and R. Kumar, "Face Detection and track-ing" in International Conference on Electronics, Communication and Aerospace Technology, ICECA 2017.

Described:

The proposed automated attendance system using face recognition is a great model for marking the attendance of students in a classroom. This system also assists in overcoming the probabilities of proxies and fake attendance. In the modern world, an outsized number of systems using biometrics are available. However, the facial recognition turns out to be a viable option because of its high accuracy along with minimum human intervention. Automated Attendance System has been envisioned for the purpose of reducing the errors that occur in the traditional attendance taking system. The aim is to automate and make a system that is useful to the organization such as an institute. The efficient and accurate method of attendance in the office environment that can replace the old manual methods. This method is secure enough, reliable and available for use. No need for specialized hardware for installing the system in the office. It can be constructed using a camera and computer.

B. Kranthi kiran and P. Pulicherla, "Face detection and recognition for use in campus surveillance", International Journal of Innovative Technology and Exploring Engineering, vol. 9, no. 3, pp. 2908-2913, 2020.

Described:

We had seen the show "Las Vegas" in social media which has seen face identification software in task. In that one episode, the security department at the fictional Montecito Hotel and Casino used CCTV to capture an image of a card counter, thief or blacklisted as distinct. It should process the captured image through the data warehouse in order to identify the person. At last the all the brutes are accompanied from the casino and they are prisoned. Since the social media cannot brings the fact as it is to the world. In 2001, the Tampa Police Department placed police cameras furnished with visual perception technology in their York City nightlife district in order to avoid the offence in that area. But it was not succeeded and it was abolished in 2003 because of its inefficiency. Hence people were opposed and forbid the cameras from getting such a clear shot to recognize anyone. Boston's Logan Airport also installed two individual tests of face identification devices at their security end. Within three months the results were thwarted.People have the capability of identifying & differentiating faces naturally, but such type of computers had built in recent days. In the mid-1960s, software developers had started to innovate the device to identify and distinguish the human faces which takes longer time and different types of algorithms and technical programs have been developed by software developers that are explained below.

METHODOLOGY

System Analysis & Requirements: Identify the monitoring needs (e.g., voltage, current, temperature) and goals (real-time data, fault detection, predictive maintenance) by consulting with MSEB engineers. System Architecture Design A system architecture for detecting fake attendance using an eye contact system would involve real-time face detection, livens detection, and eye-tracking to verify genuine presence. Hardware & Software Selection: To detect fake attendance using eye contact, you can implement a system that combines face recognition with likeness detection. System Integration: Eye-contact-based systems can enhance the accuracy of face recognition for attendance, helping to prevent fake attendance. Testing& Validation: To detect fake attendance using eye contact testing and validation, a system could combine face recognition with eye tracking and potentially other biometric features. Pilot Deployment The system would first identify a person's face and then analyze eye movements and patterns to determine if they are actively looking at the camera. The system would first identify a person's face and then analyze eye movements and patterns (like blinking) to determine if they are actively looking at the camera. Continuous Monitoring & Optimization: This allows for real-time monitoring of eye movement patterns and gaze direction, helping to identify potential spoofing attempts, such as displaying a photo or using a 3D mask.

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