International Journal of Innovative Research in Computer and Communication Engineering

| e-ISSN: 2320-9801, p-ISSN: 2320-9798| www.ijircce.com | |Impact Factor: 8.379 |

|| Volume 11, Issue 5, May 2023 ||

| DOI: 10.15680/IJIRCCE.2023.1105322 |

SMART EYE USING MACHINE LEARNING

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ABSTRACT: Automatic face recognition(AFR) technologies have seen dramatic advancements in performance over the once times, and similar systems are now extensively used for security and marketable operations. An automated system for mortal face recognition in a real time background for a company to mark the attendance of their workers. So Smart Attendance using Real Time Face Recognition is a real- world result which comes with day to day conditioning of handling workers. The task is veritably delicate as the real time background deduction in an image is still a challenge. To descry real time mortal face are used and a simple fast star element Analysis has used to fete the faces detected with a high delicacy rate. The matched face is used to mark attendance of the hand. Our system maintains the attendance records of workers automatically. Homemade entering of in logbooks becomes a delicate task and it also wastes the time. So, we designed an effective module that comprises of face recognition to manage the attendance records of workers. Our module enrols the staff's face. This enrolling is a onetime process and their face will be stored in the database. During enrolling of face, we bear a system since it's a onetime process. You can have your own roll number as your hand id which will be unique for each hand. The presence of each hand will be streamlined in a database. The results showed bettered performance over primer attendance operation system. Attendance is marked after hand identification. This product gives much further results with accurate results in stoner interactive manner rather than being attendance and leave operation systems.

KEYWORDS:Haar cascade; Face detection; machine learning;Automatic Attendance System.

I. INTRODUCTION

Maintaining the attendance is veritably important in all the institutes for checking the performance of workers. Every institute has its own system in this regard. Some are taking attendance manually using the old paper or train- grounded approach and some have espoused styles of automatic attendance using some biometric ways. But in these styles workers must stay for long time in making a line at time they enter the office. Numerous biometric systems are available but the crucial authentications are same is all the ways. Every biometric system consists of registration process in which unique features of a person is stored in the database and also there are processes of identification and verification. These two processes compare the biometric point of a person with preliminarily stored template captured at the time of registration. Biometric templates can be of numerous types like Fingerprints, Eye Iris, Face, Hand figure, hand, Gait, and voice. Our system uses the face recognition approach for the automatic attendance of workers in the office room terrain without workers' intervention. Face recognition consists of two ways, in first step faces are detected in the image and also these detected faces are compared with the database for verification. A number of styles have been proposed for face discovery i.e. Ada Boost algorithm, the Float Boost algorithm, the S- Ada Boost algorithm Support Vector Machines(SVM), and the Bayes classifier. The effectiveness of face recognition algorithm can be increased with the fast face discovery algorithm. In all the below styles suds is most effective. Our system employed this algorithm for the discovery of faces in the office room image. Face recognition ways can be Divided into two types Appearance grounded which use texture features that's applied to whole face or some specific Regions, other is point grounded which uses geometric features like mouth, nose, eyes, eye brows, cheeks and Relation between them. Statistical tools similar as Linear distinguish Analysis (LDA), star element Analysis (PCA), Kernel styles, and Neural Networks, Eigen- faces have been used for construction of face templates.

METHODOLOGY

The Haar cascade methodology is a popular machine learning approach used for object detection and recognition in computer vision. It was first introduced by Viola and Jones in 2001 and has since become widely adopted due to its effectiveness and efficiency. The methodology of Haar cascades involves the following key steps: 1. Data Collection: Initially, a large dataset of positive and negative images is collected. Positive images contain the target object that

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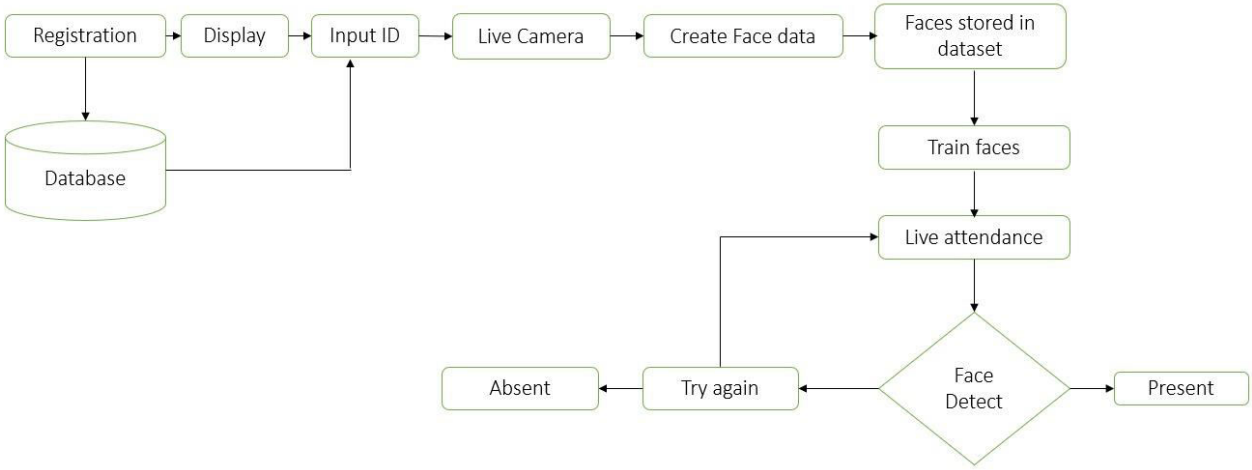
needs to be detected, while negative images do not contain the target object. For example, if you want to detect faces, positive images will contain annotated faces, and negative images will contain various other objects or backgrounds. 2. Feature Extraction: Haar-like features are computed from the collected images. Haar features are simple rectangular filters that are applied at different locations and scales within an image. These features are calculated by subtracting the sum of pixel intensities in one region of an image from the sum of pixel intensities in another region. The resulting difference represents a particular feature. 3. Adaboost Training: Adaboost, a boosting algorithm, is employed to select the best features that are most relevant for distinguishing between positive and negative examples. Adaboost assigns weights to the training samples and focuses on misclassified samples in subsequent iterations. The final result is a strong classifier that combines multiple weak classifiers (features). 4. Creating a Cascade of Classifiers: The Haar cascade is constructed by combining multiple stages of classifiers. Each stage consists of several weak classifiers (features) selected by the Adaboost algorithm. The cascade works in a cascading manner, where each stage has a progressively increasing number of features, and the classification becomes more selective at each stage. The purpose of this cascading structure is to reject non-face regions as quickly as possible. 5. Training and Validation: The constructed cascade is trained and validated using the positive and negative images. The training process adjusts the thresholds of the weak classifiers and optimizes the performance of the cascade. Validation is performed to ensure the cascade's accuracy and to fine-tune its parameters. 6. Object Detection: Once the cascade is trained and validated, it can be used to detect objects in new images or video frames. The detection process involves applying the cascade to sliding windows at different scales and positions in the image. At each window, the cascade evaluates the presence of the target object based on the response of the selected features. If the cascade confirms the presence of the object, detection is reported. Overall, the Haar cascade methodology combines the power of machine learning algorithms, feature extraction, and a cascading structure to achieve efficient and accurate object detection. It has been widely used in various applications, including face detection, pedestrian detection, and object recognition.



II. PROPOSED ALGORITHM

1 Machine Learning:

Machine Learning is such a field which gives an ability to learn without being explicitly programmed. They mainly focus on the prediction. Statistics and Machine Learning are closely related fields. They can be divided into three categories: 1) Supervised Learning 2) Unsupervised Learning 3) Reinforcement Learning.

2 Education Attendance:

Face detection has found applications in various fields, including education. Here are a few ways face detection can be utilized in an educational context Attendance Monitoring: Face detection can be used to automate attendance monitoring in classrooms. By installing cameras equipped with face detection algorithms, the system can accurately identify and record the presence of students. This eliminates the need for manual attendance taking and saves time for both teachers and students. Face detection can be employed for access control in educational institutions. By using facial recognition technology, schools can restrict entry to authorized personnel or students, ensuring enhanced security within the premises. This can be particularly useful in high-security areas or for monitoring entry into specific facilities like labs or libraries.

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3 Haar cascade:

The Haar cascade is a machine learning approach for object detection. It works by training a cascade of classifiers, where each stage consists of multiple weak classifiers. The process begins by collecting positive and negative images. Haar-like features are extracted from these images, which are simple rectangular filters that capture relevant patterns. The Adaboost algorithm is then used to select the best features for classification, iteratively adjusting weights to focus on misclassified examples. The resulting cascade is a hierarchical structure that progressively becomes more selective, allowing for efficient rejection of non-target regions. During object detection, the cascade is applied to sliding windows at various scales and positions in an image, evaluating the presence of the target object based on the response of the selected features. This enables accurate and efficient object detection, making the Haar cascade methodology popular in applications like face detection.

III. SIMULATION RESULTS

It's important to note that the performance of the Haar cascade can be influenced by various factors, including the quality and diversity of training data, the selection of Haar-like features, the number of stages and classifiers in the cascade, and the thresholds set for classification. Fine-tuning these factors and conducting thorough testing and validation are crucial to achieving optimal results in simulations and real-world applications**.**

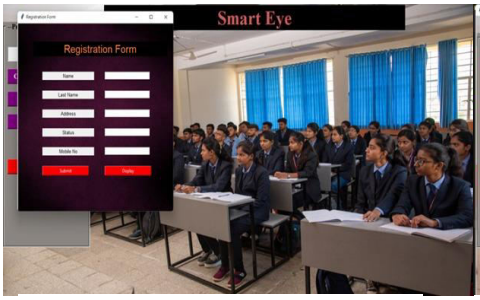

Fig. 1. Registration User

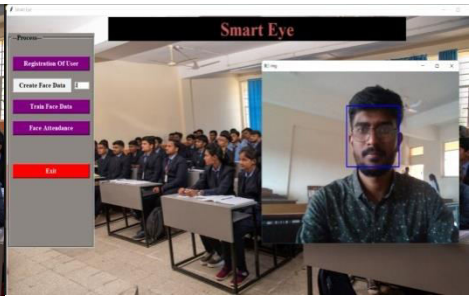

Fig. 2. Face Capture

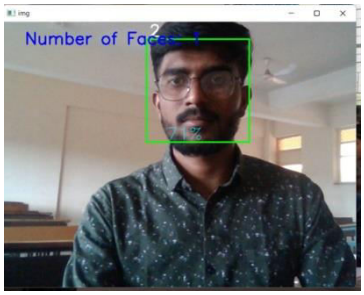

Fig. 3. Face Recognize

IV. CONCLUSION AND FUTURE WORK

In this project, we can detect and recognize faces Automated Attendance System has been envisaged for the purpose of reducing the crimes that do in the traditional(homemade) attendance taking system. The end is to automate and make a system that's useful to the association similar as an institute. The effective and accurate system of attendance in the classroom terrain that can replace the old homemade styles. This system is secure enough, dependable, and available for use. No need for technical tackle for installing the system in the classroom. It can be constructed using a camera and computer.

Adding module to fete person by their seating arrangements .We can use this system in colourful disciplines like Healthcare, Education, Government sector, Security, Crowded Area, Mega events, Sport colosseums, request Area.

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