

# **SYNOPSIS**

## **Report on**

## **FACE RECOGNITION ATTENDANCE SYSTEM**

**by**

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# ABSTRACT

**Keywords: : Deep learning, python, Image Processing, Face\_Recognition, Electron JS, HOG.**

To maintain the attendance record with day to day activities is a challenging task. The conventional method of calling name of each student is time consuming and there is always a chance of proxy attendance. The following system is based on face recognition to maintain the attendance record of students. The daily attendance of students is recorded subject wise which is stored already by the administrator. As the time for corresponding subject arrives the system automatically starts taking snaps and then apply face detection and recognition technique to the given image and the recognize students are marked as present and their attendance update with corresponding time and subject id. We have used deep learning techniques to develop this system, histogram of oriented gradient method is used to detect faces in images and deep learning method is used to compute and compare feature facial of students to recognize them. Our system is capable to identify multiple faces in real time

# TABLE OF CONTENTS

1. Introduction	4
2. Literature Review	6
3. Project / Research Objective	9
4. Research Methodology	10
5. Project / Research Outcome	12
6. Proposed Time Duration	13
References	14

# INTRODUCTION

Every organization requires a robust and stable system to record the attendance of their students. and every organization have their own method to do so, some are taking attendance manually with a sheet of paper by calling their names during lecture hours and some have adopted biometrics system such as fingerprint, RFID card reader, Iris system to mark the attendance. The conventional method of calling the names of students manually is time consuming event. The RFID card system, each student assigns a card with their corresponding identity but there is chance of card loss or unauthorized person may misuse the card for fake attendance. While in other biometrics such as finger print, iris or voice recognition, they all have their own flaws and also they are not 100% accurate.

Use of face recognition for the purpose of attendance marking is the smart way of attendance management system. Face recognition is more accurate and faster technique among other techniques and reduces chance of proxy attendance. Face recognition provide passive identification that is a person which is to be identified does not to need to take any action for its identity.

Face recognition involves two steps, first step involves the detection of faces and second step consist of identification of those detected face images with the existing database. There are number of face detection and recognition methods introduced. Face recognition works either in form of appearance based which covers the features of whole face or feature based which covers the geometric feature like eyes, nose, eye brows, and cheeks to recognize the face.

Our system uses face recognition approach to reduce the flaws of existing system with the help of machine learning, it requires a good quality camera to capture the images of students, the detection process is done by histogram of oriented gradient. And recognizing perform through deep learning. The frontend side (client side) which consist of GUI which is based on electron JS and backend side consist of logic and python (server side), an IPC (Inter Personal Communication) bridge is developed to communicate these two stacks. The images capture by the camera is sent to system for further analysis, the input image is then compared with a set of reference images of each of the student and mark their attendance.

# **LITERATURE REVIEW**

## **2.1 A Counterpart Approach to Attendance and Feedback System using Machine Learning Techniques:**

In this paper, the idea of two technologies namely Student Attendance and Feedback system has been implemented with a machine learning approach. This system automatically detects the student performance and maintains the student's records like attendance and their feedback on the subjects like Science, English, etc. Therefore the attendance of the student can be made available by recognizing the face. On recognizing, the attendance details and details about the marks of the student is obtained as feedback.

## **2.2 Automated Attendance System Using Face Recognition:**

Automated Attendance System using Face Recognition proposes that the system is based on face detection and recognition algorithms, which is used to automatically detects the student face when he/she enters the class and the system is capable to marks the attendance by recognizing him. Viola-Jones Algorithm has been used for face detection which detect human face using cascade classifier and PCA algorithm for feature selection and SVM for classification. When it is compared to traditional attendance marking this system saves the time and also helps to monitor the students.

## **2.3 Student Attendance System Using Iris Detection:**

In this proposed system the student is requested to stand in front of the camera to detect and recognize the iris, for the system to mark attendance for the student. Some algorithms like Gray Scale Conversion, Six Segment Rectangular Filter, Skin Pixel Detection is being used to detect the iris. It helps in preventing the proxy issues and it maintains the attendance of the student in an effective manner, but in one of the time-consuming process for a student or a staff to wait until the completion of the previous members.

## **2.4 Face Recognition-based Lecture Attendance System:**

This paper proposes that the system takes the attendance automatically recognition obtained by continuous observation. Continuous observation helps in estimating and improving the performance of the attendance. To obtain the attendance, positions and face images of the students present in the class room are captured. Through continuous observation and recording the system estimates seating position and location of each student for attendance marking. The work is focused on the method to obtain the different weights of each focused seat according to its location. The effectiveness of the picture is also being discussed to enable the faster recognition of the image.

# PROJECT OBJECTIVE

The project objective of a face recognition attendance system is to develop a system that can accurately and efficiently track attendance using facial recognition technology. Some specific objectives of such a project could include:

- Accurate identification of individuals: The system should be able to accurately recognize individuals based on their facial features, even in varying lighting conditions and angles.
- Efficient attendance tracking: The system should be able to quickly and efficiently log attendance for each recognized individual.
- Integration with existing attendance systems: The system should be able to integrate with existing attendance systems or be able to generate reports that can be easily integrated into existing systems.
- Data security: The system should ensure that attendance data is secure and protected from unauthorized access.
- User-friendly interface: The system should have a user-friendly interface that makes it easy for both administrators and users to use.
- Scalability: The system should be scalable, meaning that it can be used in a variety of settings and can handle a large number of users.

Overall, the goal of a face recognition attendance system project is to develop a reliable, accurate, and user-friendly system that can streamline attendance tracking and improve the efficiency of attendance management in various settings, such as schools, offices, and other institutions

# RESEARCH METHODOLOGY

The research methodology for a face recognition attendance system project may involve several steps, including:

- Literature review: Conducting a thorough literature review to understand the existing state-of-the-art face recognition techniques, attendance tracking systems, and related technologies.
- System requirements analysis: Conducting a comprehensive analysis of the requirements for a face recognition attendance system, including the target users, the desired accuracy level, the number of users, and the system's scalability.
- Data collection: Collecting a dataset of facial images that will be used to train and test the face recognition model. The dataset should be diverse, with images of individuals from different demographics and with varying lighting conditions, facial expressions, and angles.
- Face recognition algorithm selection: Selecting the most appropriate face recognition algorithm that meets the system's requirements and can accurately recognize individuals from the collected dataset.
- Model training and evaluation: Training and evaluating the performance of the selected face recognition model using the collected dataset. The evaluation should be based on accuracy, precision, recall, and other relevant metrics.
- System design and implementation: Designing and implementing the face recognition attendance system based on the selected face recognition model and the requirements analysis.
- Testing and evaluation: Testing and evaluating the performance of the implemented system using a real-world scenario and comparing the results with the performance metrics defined in the requirements analysis.
- Conclusion and future work: Summarizing the research findings and highlighting the strengths, weaknesses, and limitations of the developed system. Proposing future directions for research to improve the system's performance and enhance its usability.

Overall, the research methodology for a face recognition attendance system project involves a comprehensive analysis of the system's requirements, face recognition techniques, and evaluation metrics to ensure that the developed system meets the desired accuracy level and usability for attendance tracking.

# RESEARCH OUTCOME

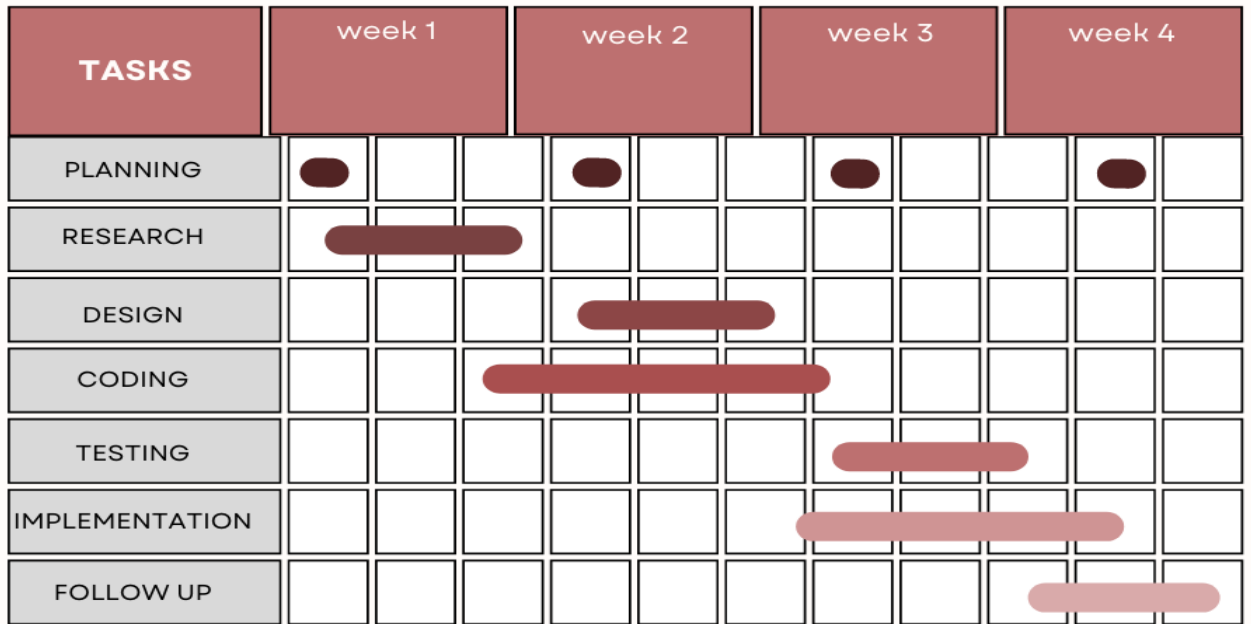
The outcome of research on face recognition attendance systems has been mostly positive. Some studies have found that using face recognition technology for attendance tracking is more accurate, efficient, and secure than traditional methods like paper-based or card-based systems. Here are some key findings from recent research:

- **Accuracy:** Face recognition attendance systems have been found to be highly accurate, with error rates as low as 0.5%. This is because facial recognition algorithms can detect unique features of each individual's face and match them with the database of enrolled faces.
- **Efficiency:** Face recognition attendance systems are faster and more efficient than traditional attendance methods. Employees or students can simply stand in front of a camera, and their attendance is recorded automatically. This eliminates the need for manual entry, which can be time-consuming and error-prone.
- **Security:** Face recognition attendance systems are more secure than traditional methods because they cannot be easily manipulated. It's difficult to cheat a face recognition system because it requires a live face to be present, and sophisticated algorithms can detect fake or manipulated images.
- **User acceptance:** Studies have shown that users generally accept face recognition technology for attendance tracking. This is because it's easy to use and doesn't require physical contact, which is especially important during the COVID-19 pandemic.



## PROPOSED TIME DURATION

### Gantt Chart for Face Recognition Attendance System:



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