

AI-Based Automation System Shutdown using Face Detection & Motion Detection

Mr. Umopathy¹, Annapoorani.D², Bavitha.M³, Geetha.M⁴, Jayanthi.A⁵

Assistant Professor, Department of Information Technology, The Kavery Engineering College (Autonomous), Mecheri,
Salem, Tamil Nadu, India¹

UG Students, Department of Information Technology, The Kavery Engineering College (Autonomous), Mecheri,
Salem, Tamil Nadu, India²³⁴⁵

ABSTRACT: Background: In the modern digital landscape, intelligence monitoring systems integrating advanced sensor technology and artificial intelligence (AI) have become essential for enhancing public safety. These systems aim to not only observe but also recognize and respond to suspicious activities effectively and efficiently. Current literature highlights the transformative impact of IoT and AI in various sectors, offering significant improvements over traditional methods. Methods: This study explores the integration of sensor networks, AI-driven algorithms, and Internet of Things platforms. Data collection involves real-time inputs from devices such as cameras, PIR sensors, and microphones, analyzed through machine learning techniques to enhance detection precision. Findings: The systems demonstrate improved monitoring efficiency and have the capacity to operate autonomously, ensuring security across both public and private sectors. They offer long-term cost savings and overcome the limitations inherent in human-operated systems. Conclusion: These systems represent a significant advancement toward proactive and intelligent surveillance, enhancing public safety and security. Novelty/Originality of this article: The research underscores the novel integration of cutting-edge technologies in intelligence monitoring, establishing new benchmarks in adaptability and responsiveness, and setting the foundation for future advancements in cohesive and sustainable surveillance frameworks.

KEYWORDS: Artificial Intelligence (AI), Face Recognition, Attendance Management System, Computer Vision, Deep Learning, Convolutional Neural Networks (CNN), Facial Encoding, Biometric Authentication, OpenCV, Flask Framework, Real-Time Processing, Dashboard Analytics, Automation, Smart Classroom System

I. INTRODUCTION

As Attendance is an important factor for both the student as well as the teacher of an academic organization. The student's attendance system using artificial intelligence idea mainly works using the concept of Facial Detection, face recognition system and Student's attendance observing system and applications. Maintaining the attendance is very important in every and each groundwork for checking the performance of students. Every organization has its own technique. Face is considered as a primary key feature to spot and speak with alternative peoples within the world because face considered as a unique identity for every and each person. The facial features will be unique to the other industrial. It processes overall facial structure, distances between color, ears, eyes, nose and mouth, etc. Except for computers, it's tough to analyse the data therefore we tend to use the concept of Computer vision. The intention of using computer vision technology to recognize the human features in a computer. Hence, this technique handles all the problems that occurred in traditional system and other bio metrics strategies.

1.1. OUTLINE OF THE PROJECT

In this project, face of a person is used for the aim of attendance making automatically. As Attendance plays an important role for each college, universities and schools. A number of an automated biometric-based attendance system are projected within the literature reviews, poor system models have negatively affected their performance. Hence, a necessity to handle the various desires needed with the development of an AI-based attendance observation system. Attendance observation System is important in all organizations for checking the performance of students and it is not easy task to check each and every student is present or not. As we can see in all organization attendance are taken manually by calling their roll numbers or names and marked present in registers issued by the department heads as a

proof and in some organizations the students wish to sign on these sheets which are stored for future references. In this system, we use are using the technique of utilization of face detection and recognition framework to endlessly recognize students going to class or not and marking their attendance by comparing their faces with stored information in database to match and marking attendance. This facial biometric framework takes an image of a person using camera and distinction image with the stored image in the database at the time of enrolment and if it matches, marks the attendance and monitor the student performance endlessly. We may use the concept of artificial intelligence to observe student attendance like capturing the motion photos of the student when present in class to analyse the student data how much time the student presents in class.

II. LITERATURE SERVEY

Marko Arsenovic et al) The developing procedure is split into several necessary stages, together with the training dataset and augmentation, getting ready images and training DNNs and last but not least, integration into the prevailing system so as to check the proposed method. In this paper, a brand-new deep learningbased face recognition attendance system is projected. The complete procedure of developing a face recognition element by combining state-of-the-art ways and advances in deep learning is delineated.

[1] (Louis Mothwa et al) It demonstrates how a multicamera installation reduces the impact of occlusion within the method of face detection, since higher face detection will increase the accuracy of sophistication class attendance observation. A wise model for student attendance monitoring system supported on facial recognition has been conferred in this paper. The real-time face recognition with periodical updates of the attendance info determines the presence of students throughout the total lecture period.

[2] (RefikSamet et al) The system consists of three layers: Application Layer, Communication Layer, and Server Layer. A filtering system based on Euclidean distances calculated by Eigenfaces, Fisher faces, and LBP has been developed. The projected system eliminates the price for further instrumentation, minimizes attendance-taking time, and permits users to access the information anytime and anyplace.

[3] (Dr.B.R.Shunmugapriya et al)The group image of the students is captured and shold on within the database. The individual faces of each student area unit recognized by face detection algorithm program. The project conferred the robust human face recognition system supported on discriminative robust native binary pattern and LDP for automatic attending system.

[4] (Naveed Khan Balcoh et al) The system consists of a camera that captures the pictures of the classroom and sends it to the image enhancement module. After enhancement the image comes within the Face Detection and Recognition modules then the attendance is marked on the information/database server. This paper introduces the efficient and correct methodology of attendance within the classroom atmosphere that may replace the recent manual ways. This methodology is secure enough, reliable and accessible to be used. No need for specialized hardware for putting in the system within the classroom.

[5] There is a need to create such a system which will solve this problem and make a user-friendly environment for the customer [10]. Also, human fingerprint considered as the most trustworthy criteria for identification and it also cannot be changed with time even up to the death of an individual [11].

III. IMPLEMENTATION

EXISTING SYSTEM

- Students log in to systems manually using username and password.
- Face recognition is mainly used for attendance, not for system control.
- Idle time detection is used in some systems for automatic shutdown.
- Automatic shutdown works only after a fixed time limit.
- Centralized monitoring is only for Street Lights not for System.
- Staff intervention is required for manual power management.

3.1. DISADVANTAGES OF EXISTING SYSTEM

- Manual System access.
- No real-time user verification.
- No popup alert to inform the user.

- Sudden shutdown without any warning.
- Unsaved work may be lost.
- No time based access control.
- limited centralized monitoring(only view).

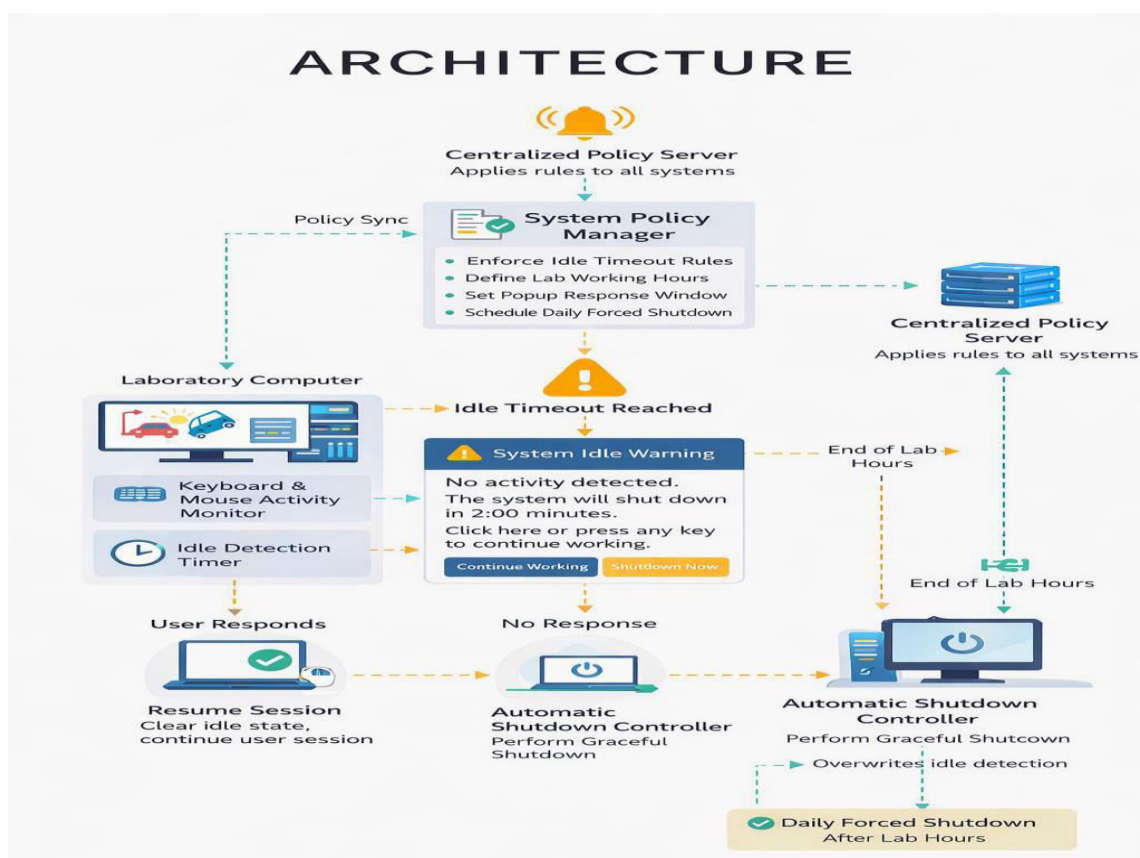
3.2. PROPOSED SYSTEM

- Face recognition–based secure login.
- AI-based user presence detection.
- Time-slot based lab access control.
- Popup warning before automatic shutdown.
- Intelligent idle time monitoring.
- Automatic system shutdown
- Centralized lab monitoring.

3.2.1. ADVANTAGES

- Secure face recognition–based access.
- Prevents unauthorized system usage.
- Popup warning avoids data loss.
- Intelligent idle detection & auto shutdown.
- Time-based lab utilization.
- Centralized monitoring.
- Reduced power consumption.
- Minimal manual intervention.

BLOCK DIAGRAM



IV. MODULES DESCRIPTION**1.Dataset Creation Module**

- Stores multiple student face images in the dataset folder using OpenCV.
- The stored images are used to train the recognition system.

2. Face Detection Module

- Detects faces from webcam frames using the Haar Cascade algorithm.
- Draws a bounding box around the detected face.

3.Face Recognition Module

- Compares detected faces with stored dataset images using dlib.
- Identifies the student based on facial features

4.Student Identification Module

- Displays the student register number after successful face recognition.
- Confirms the identity of the student using the stored dataset.

5.Idle Detection Module

- pynput library listens to keyboard and mouse activity to track system usage.
- Detects system inactivity after a predefined time.

6.Popup Warning Module

- tkinter popup window appears on screen when idle state is detected.
- Popup message: "System is idle please press keyboard or mouse."

V. CONCLUSION

In the modern world security is one of the major issues. As technology is getting advanced many security issues are arising. The existed developed security methods have some flaws and they can be hacked. The proposed system for resolving the security issue is based on face detection and recognition using Internet of Things (IoT). The face of a person is captured by the camera and compared with the acquired database. The authorized user can also utilize mobile application to give access to the premises to any unregistered person. In the case of unauthorized/unknown access, the face image of the person will be captured and notified to the concerned authorities through an email. An Alarm will be generated in the case of unauthorized access. The proposed system produced accurate results in both cases: authorized and unauthorized access. The introduced system provides a low-cost solution for monitoring and controlling the houses, different organizations like banks, universities, etc.

REFERENCES

1. Turk, M., & Pentland, A. (1991). Face recognition using eigenfaces. Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition, 586–591.
2. Sarkar, S., & Black, M. J. (2006). A survey of face recognition techniques. Pattern Recognition, 39(10), 1749–1765.
3. Li, Z., & Xu, Y. (2019). An AI-based intelligent attendance system. International Journal of Engineering and Technology, 11(3), 1-6.
4. Olivier, P., & Ouellet, F. (2015). An AI-based system for employee attendance management using facial recognition. International Journal of Artificial Intelligence & Applications (IJAIA), 6(5), 15-27.
5. Singh, R., & Kumar, S. (2019). A review on the current attendance system and challenges. International Journal of Advanced Research in Computer Science, 10(1), 23-28.
6. Patil, R., & Yadav, R. (2018). Comparative study on various attendance management techniques. International Journal of Engineering Research and Technology, 7(2), 93-98.
7. Huang, L., & Zhang, T. (2018). Application of face recognition in attendance system. Procedia Computer Science, 139, 343-350.

8. Ding, S., & Liu, Y. (2019). Real-time face recognition-based attendance system for classrooms and workplaces. Proceedings of the International Conference on Artificial Intelligence and Computer Science, 125-128
9. Raj, R., & Krishnamurthy, A. (2020). AI-driven attendance management with real-time face recognition. Journal of Computational Intelligence and Systems, 11(2), 100-104.
10. Li, F., & Chen, J. (2018). Privacy issues in facial recognition systems for attendance. Journal of Information Privacy and Security, 14(3), 29-42.



INTERNATIONAL
STANDARD
SERIAL
NUMBER
INDIA



INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN SCIENCE | ENGINEERING | TECHNOLOGY

 9940 572 462  6381 907 438  ijirset@gmail.com



www.ijirset.com

Scan to save the contact details