Suspicious Activity Detection in Exam Hall

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***Abstract*—This project, titled "Suspicious Activity Detection in Exam Hall Using CNN," aims to automatically detect and alert exam supervisors about suspicious behavior during examinations. The system uses video input from a camera and processes it through image preprocessing and feature extraction techniques. A Convolutional Neural Network (CNN) model is trained using a dataset of normal and suspicious activities to identify unusual behavior such as cheating or using mobile phones. When suspicious activity is detected, the system captures the image and sends an email alert to the examiner. This project helps to ensure a fair and transparent examination process by reducing manual monitoring and improving accuracy and reliability through artificial intelligence.**

I. INTRODUCTION

Examination environment consists of large number of candidates and number of exam conductors and guards. Lot of human efforts are needed to continuously watch over the candidates for prevention of any mishap or cheating. A human cannot always pay attention and concentration of this much to the exam. Hence, in order to address the problem of cheating in exam and for reduction in human efforts, this suspicious activity detection system is designed. In existing system, the detection of abnormal activity is done in a examination environment. That system uses 3D Convolution Neural Network(CNN) for detection which comprises of two convolution layers instead of five. System is able to detect only the basic gestures of the candidates in an examination environment. Existing system is not able to detect the facial features. Also, it is not able to recognize or identify the particular candidate based on his/her suspicious activity.

II. PROBLEM STATEMENT

During examinations, it is difficult for invigilators to continuously monitor all students and identify suspicious activities. Manual observation is time-consuming and prone to human error. To solve this problem, a smart system is needed that can automatically detect suspicious behavior using video analysis and send instant alerts to the examiner.

III. METHODOLOGY

The system captures live video from the exam hall using a camera. The video is divided into frames and goes through image preprocessing to remove noise and improve clarity. Then, using CNN, important features are extracted and classified as normal or suspicious activity. If normal, the system continues monitoring; if suspicious, it captures the image and sends an alert email to the examiner. This architecture helps in automatic monitoring, reduces manual work, and ensures a fair and secure examination process

Objectives

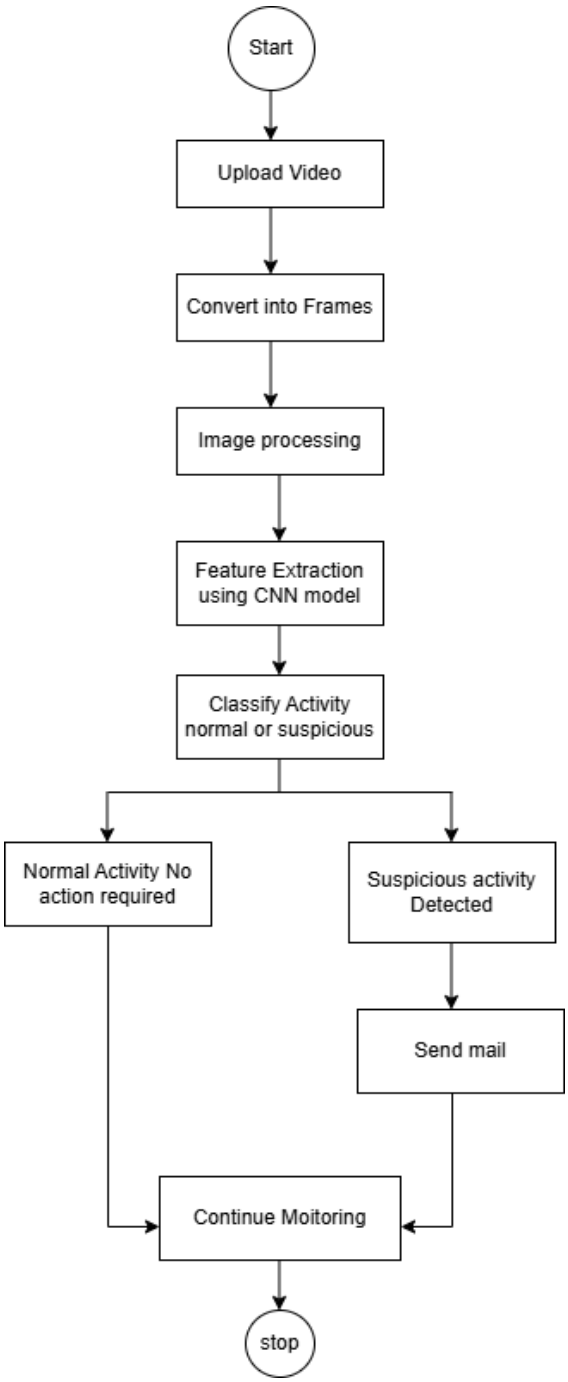
- To develop an automatic system that can detect suspicious activities in an exam hall using video input.
- To use Convolutional Neural Network (CNN) for identifying normal and abnormal student behavior.
- To perform image preprocessing and feature extraction for improving detection accuracy.
- To generate real-time alerts when suspicious activity is detected.
- To send email notifications to the examiner or supervisor with the detected image.
- To reduce manual monitoring and make the examination process more secure and fair.
- To create a low-cost, efficient, and reliable solution using artificial intelligence and computer vision.

Motivation

The motivation behind the Suspicious Event Detection in Examination Hall project is to enhance the security and integrity of the examination process.

The goal is to develop a system that can identify and detect any suspicious activities or events during the exam, such as cheating, impersonation, and unauthorized access. Cheating and academic dishonesty are widespread issues that undermine the fairness and credibility of the examination process. Examining bodies often face challenges in detecting and preventing such activities due to the vast number of candidates, limited monitoring resources, and the use of increasingly sophisticated methods by cheater

Flow chart

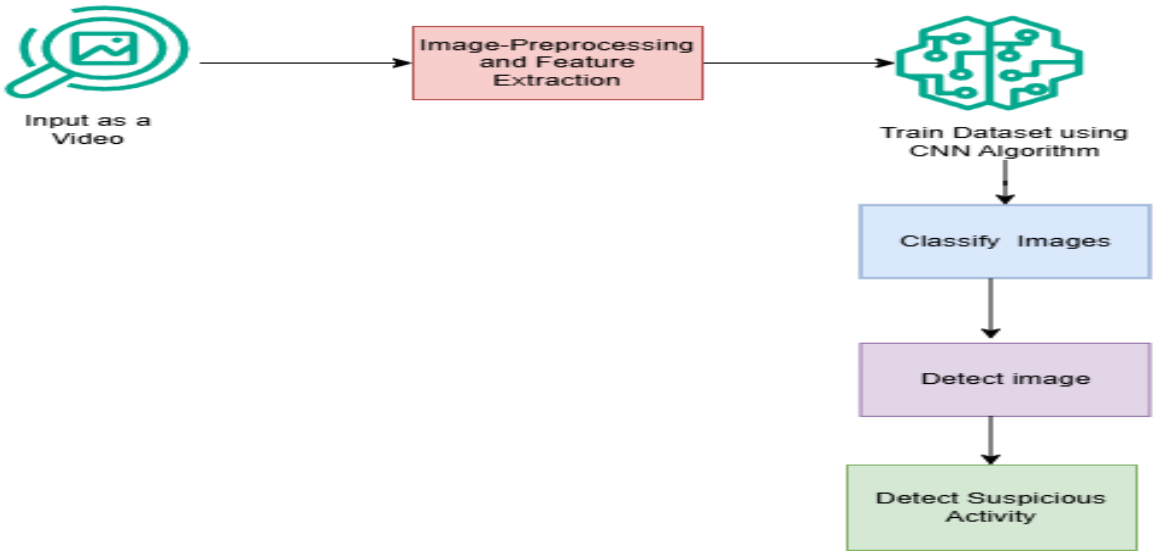


Hardware and Software Requirements
Software Requirement

- Database : DBSqlite3
- IDE :Spyder
- Language : Python
- Hardware Requirement
- Processor : intel i5
- Ram : 8 GB
- Hard desk : 40GB

IV. WORKING SCOPE OF ARCHITECTURE

The system captures live video from the exam hall using a camera. The video is divided into frames and goes through image preprocessing to remove noise and improve clarity. Then, using CNN, important features are extracted and classified as normal or suspicious activity. If normal, the system continues monitoring; if suspicious, it captures the image and sends an alert email to the examiner. This architecture helps in automatic monitoring, reduces manual work, and ensures a fair and secure examination process



Proposed System

- The proposed system aims to enhance the integrity and security of the examination process by leveraging advanced technologies and methodologies to detect and prevent suspicious activities in exam halls. This system integrates multiple components to monitor, analyze, and manage the examination environment effectively.
- AI-Based Video Analytics: Deploy AI-powered video analytics to analyze candidate behavior and detect signs of cheating or other suspicious activities. Algorithms can detect unusual movements, such as frequent head turning or suspicious gestures.
- Alert System: Implement an automated alert system that notifies proctors and security personnel of any detected suspicious activities or anomalies

Module's Algorithm

1. Video Capture Module

- The camera captures live video from the exam hall.
- The video is divided into frames (images).
- Each frame is sent for processing.

2. Image Preprocessing Module

- The frame is resized and cleaned to remove noise.
- The image is normalized so that the model can read it easily.
- The processed frame is sent to the CNN model.

3. CNN Detection Module

- The CNN model checks the frame.
- It extracts features like movement and gestures.
- It decides if the activity is normal or suspicious.

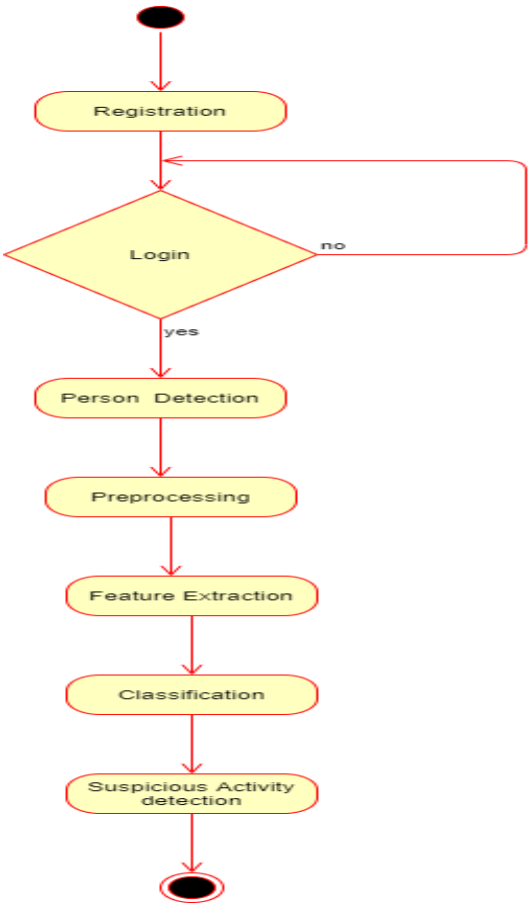
4. Alert Module

- If suspicious activity is found:
  - The system captures the image.
  - Sends an email alert to the examiner.
  - Saves the image as proof.
- If normal, the system continues monitoring.

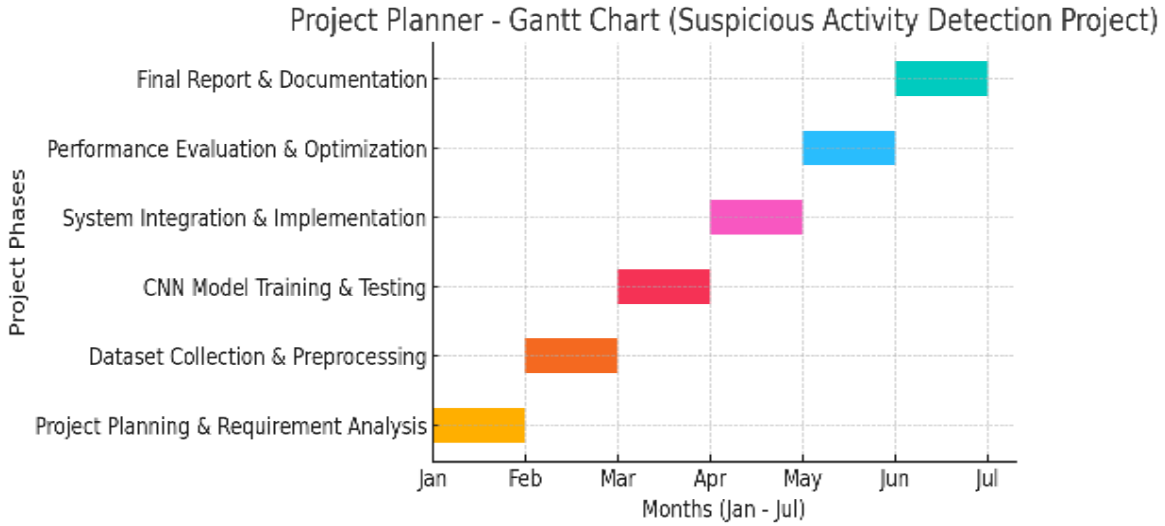
5. Storage Module

- Stores all detected images, time, and details for records

Activity Diagram



Project Timeline and Cost Estimation



Advantages

- Automatically monitors students during exams.
- Detects suspicious activity in real time.
- Reduces human error and saves time.
- Maintains fairness and prevents cheating.
- Stores captured images as proof.
- Low-cost and easy to implement.
- Can be used in multiple exam halls.

Limatations and Challenges

- Accuracy may decrease in low lighting or crowded exam halls.
- Requires a constant internet connection for sending email alerts.
- System performance depends on camera quality and hardware speed.
- False detections may occur if students move suddenly or change posture.
- Needs proper dataset training for better accuracy.
- Cannot work properly if the camera is blocked or malfunctioning.

V. FUTURE SCOPE

- The system can be improved using advanced deep learning models for higher accuracy.
- It can include face recognition to identify individual students during exams.
- Voice detection can be added to detect talking or whispering.
- Can be connected to a mobile app or web dashboard for live monitoring.
- Cloud storage can be used to save and review suspicious activity recordings.
- The system can be upgraded to work in real-time across multiple cameras.
- Can be applied in other areas like surveillance, security, and crowd monitoring.

VI. CONCLUSION

The project “Suspicious Activity Detection in Exam Hall Using CNN” successfully provides an automated way to monitor students and detect unfair activities during examinations. The system uses video input from a camera and analyzes it through a Convolutional Neural Network (CNN) to identify suspicious movements or behavior. When such activity is detected, it captures the image and sends an email alert to the examiner. This system helps reduce manual supervision, saves time, and ensures a fair and transparent examination process. It is cost-effective, reliable, and efficient, making it useful for schools, colleges, and online exam centers. In the future, it can be enhanced with additional features like face and voice recognition for better accuracy and security.

VII. ACKNOWLEDGMENT

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