

# AI Proctoring System For College Campus

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**Abstract** - In recent years, the field of educational technology has experienced remarkable advancements. Schools and universities have been embracing online platforms to better cater to their students needs, and artificial intelligence-driven proctoring solutions have become increasingly prevalent. These AI proctoring systems (OPS) leverage digital tools to ensure the integrity of examinations. The abstract of the online exam proctoring system project presents an innovativeweb-based solution for secure and fair remote examinations. This system allows candidates to register, log in, and complete exams while being continuously monitored by an AI-based proctoring system. The system integrates modules for face recognition, object detection employing advanced algorithms such as CNN and YOLO. In the event of any cheating attempts, the system promptly alerts administrators, captures photos and timestamps as evidence. This project addresses the pressing need for maintaining academic integrity in online assessments, providing a comprehensive and reliable solution for educators and institutions. The face recognition module utilizes deep learning to enhance identity verification, while object detection ensures a cheat-resistant environment. With real-time movement analysis powered by advanced algorithms like CNN and YOLO, the system remains vigilant throughout the examination duration. The commitment to transparency is evident through instant alerts, thorough evidence capture, and personalized reports, fostering a sense of trust.

**Key Words:** Yolo, CNN.

## 1. INTRODUCTION

The AI-based proctoring system developed using html, css, javascript, Python, Django, and SQLite, incorporates state-of-the-art algorithms such as Convolutional Neural Networks (CNN) and YOLO (You Only Look Once) to ensure a robust and effective monitoring solution for online exams. This system leverages the power of artificial intelligence to monitor and analyze student behavior during exams, with a particular focus on detecting irregularities and maintaining exam integrity. By integrating Django for web application development and SQLite for database management, the system provides a user-friendly and secure platform for both students and exam administrators. With the application of

CNN and YOLO algorithms, the system excels in real-time face detection, object recognition, and posture assessment, ensuring that online exams are conducted with the utmost integrity and fairness. This system is designed to ensure the security and integrity of online exams, creating a robust framework for the examination process. The core structure of this system consists of an exam portal, which serves as the platform for candidates to take their exams. Administrators and professors hold the power to generate and manage questions, ensuring the academic quality of the assessments.

## 2. LITERATURE SURVEY

During the exam, the system continuously monitors candidates via their webcam. When suspicious activities are detected, such as a failure in face recognition or the presence of unauthorized objects, warning alerts are generated. The system takes action by capturing photos of the candidate along with a timestamp, creating a record of any violations. After three alerts, the system automatically logs the candidate out, thereby terminating their participation in the exam. The photos and timestamps are sent to the proctoring system administrator for further investigation. The final component of this system is the generation of personalized reports for each candidate. The final component of this system is the capture and documentation of violations during the exam. These violations are recorded through photographs, providing clear evidence of any infractions.

### 2.1. Existing Papers

The COVID-19 pandemic has provided students more opportunities to learn and improve themselves at their own pace. Online proctoring services (part of assessment) are also on the rise, and AI-based proctoring systems (henceforth called as AIPS) have taken the market by storm. Online proctoring systems (henceforth called as OPS), in general, makes use of online tools to maintain the sanctity of the examination. While most of this software uses various modules, the sensitive information they collect raises concerns among the student community. There are various psychological, cultural and technological parameters need to be considered while developing AIPS.

these Online Proctoring technologies outweigh their risks. The most reasonable conclusion we can reach in the present is that the ethical justification of these technologies and their various capabilities requires us to rigorously ensure that a balance is struck between the concerns with the possible benefits to the best of our abilities. To the best of our knowledge, there is no such analysis on AIPS and OPS. Our work further addresses the issues in AIPS in human and technological aspect

Good Proctor or “Big Brother”? Ethics of Online Exam Supervision Technologies. Authors: Simon Coghlan, Tim Miller, Jeannie Paterson Online exam supervision technologies have recently generated significant controversy and concern. Their use is now booming due to growing demand for online courses and for of-campus assessment options amid COVID-19 lockdowns. Online proctoring technologies purport to effectively oversee students sitting online exams by using artificial intelligence (AI) systems supplemented by human invigilators.

An automated online proctoring system using attentive-net to assess student mischievous behavior. Authors: Tejaswi Potluri, Venkatramaphanikumar S, Venkata Krishna Kishore In recent years, the pandemic situation has forced the education system to shift from traditional teaching to online teaching or blended learning. The ability to monitor remote online examinations efficiently is a limiting factor to the scalability of this stage of online evaluation in the education system. Human Proctoring is the most used common approach by either asking learners to take a test in the examination centers or by monitoring visually asking learners to switch on their camera.

### 3. SYSTEM ARCHITECTURE

The system architecture for the AI proctoring platform is structured as a web-based solution for candidate registration and exam management. The web portal, constructed with HTML, CSS, and JavaScript, facilitates user interaction, while the server-side functionality is handled by Django, a Python-based web framework. Data management is maintained through a SQLite database. The core functionality involves real-time monitoring of candidates during exams using AI algorithms to detect various forms of cheating, including plagiarism, unauthorized collaboration, or identity fraud.

#### 3.1. Design

The design which is used to design the software related requirements. In this paper, complete system design is generated and shows how the modules, sub modules and the flow of the data between them are done and integrated. It is very simple phase that shows the implementation process.

### 3.2. Requirement Analysis

For any software project there are different kinds of requirements to be fulfilled in order to ensure smooth running of the processes. Clearly defined requirements are important markers on the road to a successful project. They establish a formal agreement between the customer and the service provider that both are working towards the same goal. The following are the different kinds of requirement for our project:

Table-1: Requirements of our system

Software Requirements	Hardware Requirements
Visual Studio Code	Windows 11 or latest version
Python	8 GB RAM
	Intel core processor i3
	100GB free Hard Disk

### 3.3. Proposed System.

The proposed system of an AI proctoring system platform designed to provide a secure and fair environment for candidates taking exams remotely via a web portal. It enables candidates to register and log in to the exam portal, where the AI-based proctoring system takes over by continuously monitoring candidates throughout the examination. This advanced system incorporates modules for face recognition and object detection harnessing the power of CNN and YOLO algorithms to detect and prevent cheating. In the event of any violation, such as unauthorized collaboration or prohibited resources usage, the system promptly alerts administrators while capturing photos and timestamps as evidence.

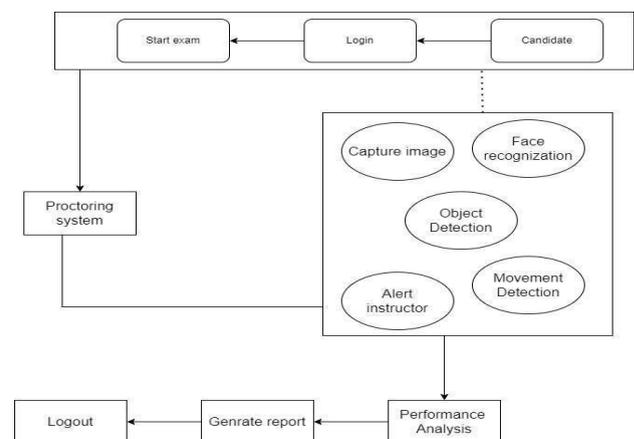


Fig-1: Proposed System of our system

### 3.4. System Process

AI proctoring system illustrates the complete project lifecycle. It commences with the project's initiation, followed by the candidate logging in and initiating the exam. The proctoring system starts monitoring, and at each exam stage, it captures and analyzes the candidate's face, objects in the environment, and movements.

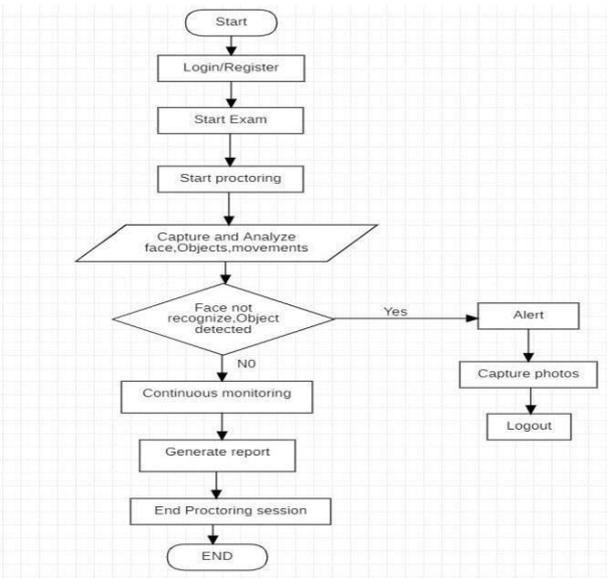


Fig-2: Flow of the AI proctoring system

After this, the system concludes the monitoring process and the exam. This flowchart presents a visual representation of the end-to-end process for maintaining exam integrity and reporting within the online exam proctoring system.

### 4. RESULTS

The implementation of an AI proctoring system incorporating the YOLO (You Only Look Once) algorithm for object and person detection has yielded highly promising results. Through a combination of image capture and real-time monitoring, the system demonstrated exceptional proficiency in detecting objects and individuals. Moreover, the model was further fine-tuned to enhance its object detection capabilities. This advanced AI proctoring system not only ensures the comprehensive supervision of testing environments but also highlights the potential for further refinement and adaptability in future applications. The successful integration of YOLO technology underscores the system's potential to significantly improve the integrity and security of online proctoring, representing a substantial advancement in the field of e-learning and examination monitoring.

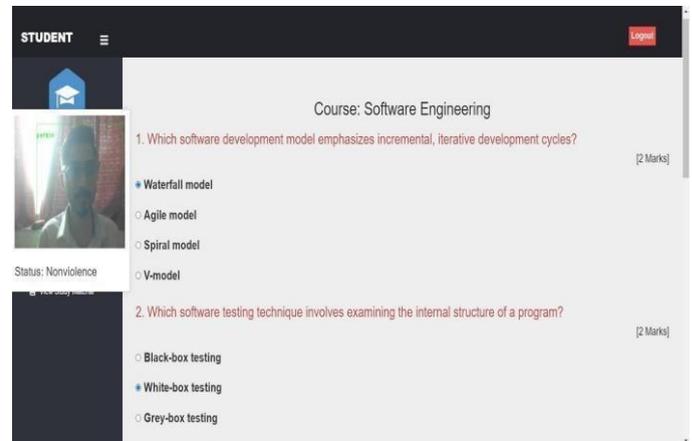


Fig-3: Exam panel

Fig 3. describes the Exam panel of our project. It contains camera on exam portal view.

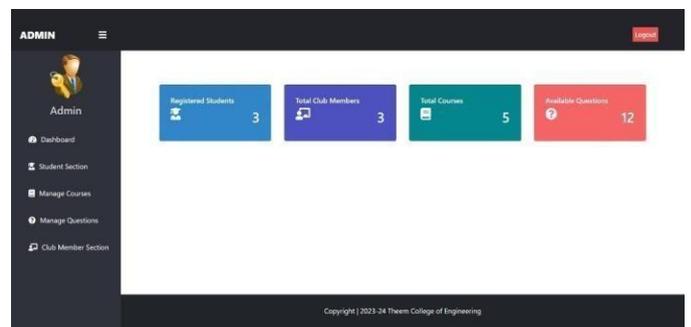


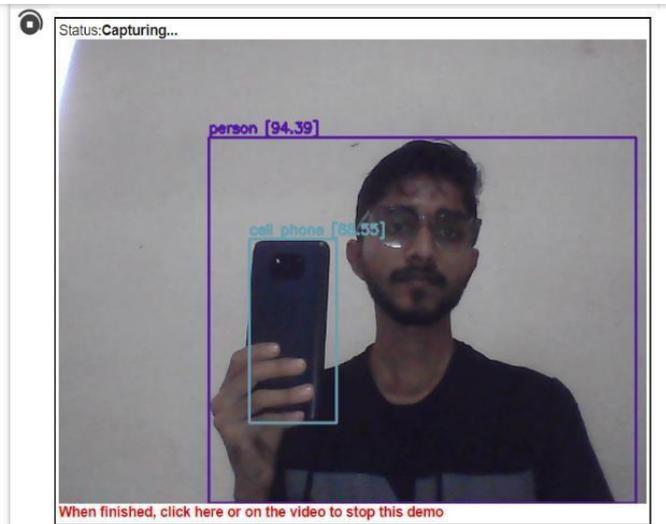
Fig-4: Admin portal

Fig 4 show how an admin can access the exams and upload the question and answer and any other study material.



Fig-5: person appearing for the exam

Fig 5 shows the how person is detected while he is appearing for the exam and captured the photo.



**Fig-6:** Person and cell phone detection

Fig 6. Describes the result of student how is using the mobile phone while appearing for the exam.

## 5. CONCLUSIONS

In conclusion, our AI proctoring system project has reached its completion, successfully integrating the examination system with proctoring capabilities. Through meticulous effort and innovation, we have achieved our goal of creating a comprehensive solution for maintaining honesty during online exams. By leveraging advanced technologies like live object detection and facial recognition powered by the YOLO algorithm, we've ensured real-time monitoring and accurate detection of suspicious behaviors. This milestone marks a significant advancement in online education, promising a secure and reliable testing environment for students and educators alike. Our integrated system offers a technologically advanced solution that combines the convenience of online exams with robust monitoring capabilities. With features such as real-time monitoring, facial recognition, and behavior analysis, we've established a framework for upholding the integrity of online assessments. While embracing the benefits of AI proctoring, it's essential to address concerns surrounding privacy, algorithmic biases, and effective implementation. We remain committed to responsible usage, striving to strike a balance between security and fairness to enhance the overall user experience. Proctoring systems represent a promising tool for safeguarding academic integrity in online education. By efficiently detecting cheating behaviors and ensuring exam credibility, they contribute to the advancement of online learning. However, it's imperative to prioritize privacy rights and continuously evaluate and refine these systems to mitigate limitations and enhance accuracy.

## ACKNOWLEDGEMENT

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