



# International Journal of Innovative Research in Science Engineering and Technology (IJIRSET)

*(A Monthly, Peer Reviewed, Refereed, Scholarly Indexed, Open Access Journal)*



**Impact Factor: 8.699**

**Volume 14, Issue 12, December 2025**

# Malpractice Detection System for Offline Examination

Prof. Vijayalakshmi S Hallikeri<sup>1</sup>, Rinith R<sup>2</sup>, Siddhartha H<sup>2</sup>

Assistant Professor, Department of Artificial Intelligence & Machine Learning, Bapuji Institute of Engineering and  
Technology, Davangere, Karnataka, India<sup>1</sup>

Student, Department of Artificial Intelligence & Machine Learning, Bapuji Institute of Engineering and Technology,  
Davangere, Karnataka, India<sup>2</sup>

**ABSTRACT:** The rising use of digital devices in examination settings has made it difficult to detect subtle forms of malpractice through traditional supervision alone. This work presents an AI-based monitoring approach that uses real-time video analysis and object detection to identify cheating-related items such as mobile phones, watches, books, and laptops. A hybrid model combining COCO-SSD and YOLOv8 enhances detection accuracy and supports automated surveillance. The system demonstrates how intelligent monitoring can strengthen exam integrity and provide a reliable foundation for future AI-driven proctoring solutions.

**KEYWORDS:** Artificial Intelligence, Exam Malpractice Detection, Object Detection, COCO-SSD, YOLOv8, Real-Time Surveillance, Multi-Camera Monitoring, Academic Integrity, Computer Vision, Automated Invigilation Systems

## I. INTRODUCTION

Maintaining fairness in offline examinations has become increasingly difficult as modern technologies allow for concealed and sophisticated cheating attempts. Manual invigilation often struggles to detect such activities in large exam halls, creating a need for automated methods that can operate consistently and with greater precision.

Advances in Artificial Intelligence and Machine Learning provide effective tools for real-time monitoring. Computer vision models can analyze camera feeds, detect suspicious objects, and assist invigilators by reducing oversight errors. Integrating these technologies creates a scalable and reliable framework for strengthening academic integrity in examination environments.

## II. LITERATURE SURVEY

Recent studies have documented a considerable increase in academic dishonesty during technology-assisted examinations, especially during the COVID-19 period, emphasizing the need for stronger and more automated proctoring mechanisms [1]. Machine learning approaches have been widely explored for analyzing cheating behaviors, with researchers demonstrating that behavioral patterns and multi-account interactions can be effectively detected using data-driven models [2]. Other works have examined eye-tracking and gaze-based monitoring, showing that visual attention patterns can provide reliable indicators of engagement and potential misconduct, and that low-cost mobile-based tracking can support real-time proctoring applications [3], [6].

Scholars have also highlighted the role of psychological and ethical factors in influencing a student's likelihood to cheat, noting that academic pressure, personal motivation, and moral reasoning remain key contributors to dishonest practices [4], [5]. In parallel, advancements in deep learning have enabled robust activity-recognition and behavior-analysis systems, which have shown strong applicability in identifying anomalies and human actions across various environments, including those relevant to examination settings [8]–[10]. More recent research proposes hybrid surveillance frameworks that integrate multiple sensing modalities—such as behavioral analytics, ML-based classifiers, and video monitoring—to improve detection accuracy. However, comprehensive real-time solutions tailored specifically to offline examinations remain limited, indicating continued scope for systems that combine object detection, multi-camera integration, and automated alerts to enhance malpractice detection [11], [12].

### **III. PROBLEM STATEMENT**

Ensuring fairness in offline examinations is difficult due to various forms of malpractice such as the use of mobile phones, hidden materials, or unauthorized electronic devices. Manual invigilation is often insufficient, especially in large examination halls with multiple students and limited staff. To address this challenge, the project aims to develop an AI-powered real-time monitoring system that utilizes multi-camera video streaming and object detection techniques to automatically identify cheating-related objects and activities. The system enhances exam surveillance by detecting mobile phones, books, laptops, and other suspicious items, providing live alerts and visual evidence, thereby strengthening academic integrity.

### **IV. OBJECTIVES**

- To develop an automated real-time monitoring system using advanced computer vision techniques that can detect exam malpractice by identifying objects such as mobile phones, watches, books, laptops, and other unauthorized materials through integrated COCO-SSD and YOLOv8 deep learning models.
- To build a centralized Flask-based framework capable of receiving video streams from multiple devices, processing frames efficiently, and generating annotated outputs along with timestamped evidence to ensure transparency and reliable incident documentation.
- To strengthen examination integrity by minimizing dependence on manual invigilation, enabling continuous AI-driven supervision, and reducing the likelihood of undetected cheating in offline examination environments.

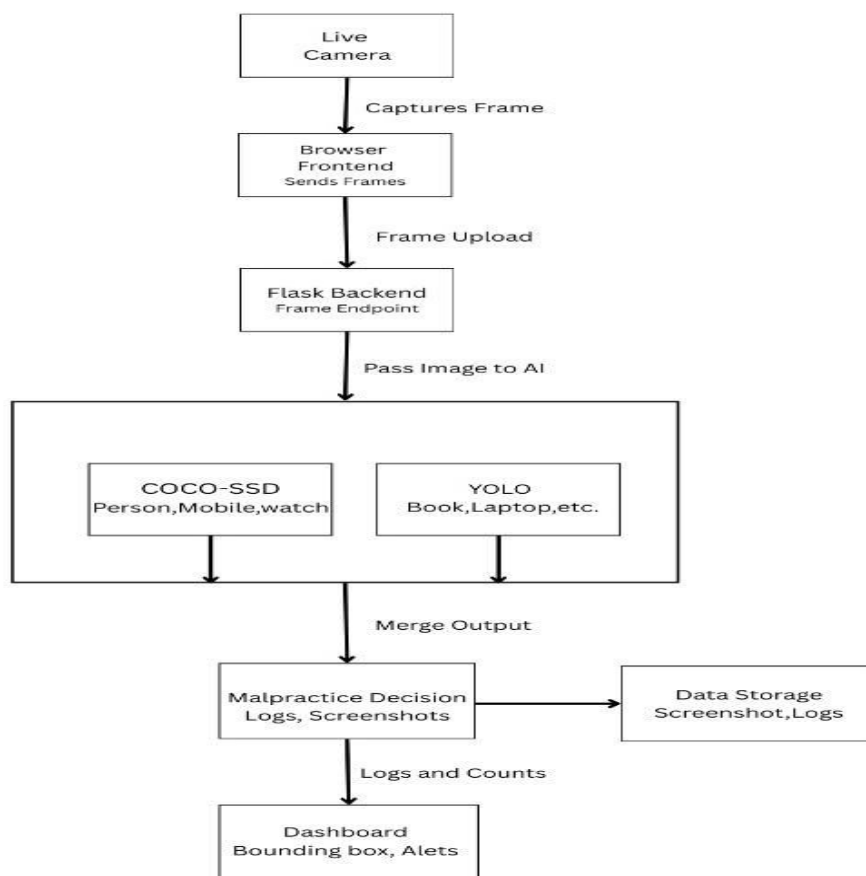
### **V. PROPOSED SOLUTION**

The proposed system uses an AI-powered framework to automate malpractice detection in offline examinations. Video feeds from laptops, mobile cameras, and external webcams are directed to a central Flask server, where individual frames are processed through a dual-model pipeline. COCO-SSD detects persons, mobile phones, and watches, while YOLOv8 identifies additional items such as books and laptops. Detection outputs are merged, annotated, and stored as evidence. A real-time dashboard presents device activity, student counts, and malpractice alerts, enabling invigilators to monitor exam halls efficiently. This approach reduces reliance on manual monitoring and increases the accuracy and consistency of malpractice detection.



## VI. SYSTEM DESIGN

### 1. SYSTEM ARCHITECTURE



**Figure1: System Architecture of Janmitra**

The system architecture is designed as a modular pipeline beginning with live video capture from connected devices. Each device uses a browser interface to extract frames and upload them to the Flask backend, which serves as the central processing unit. Transmitting images instead of continuous video ensures compatibility across hardware types and maintains low latency during frame transmission.

At the server level, incoming frames pass through a hybrid detection module that integrates COCO-SSD and YOLOv8. The first model identifies persons and handheld devices, while the second detects larger or varied objects related to malpractice. After merging detection results, the system determines whether an alert should be raised and stores annotated evidence along with metadata. A live dashboard visualizes the detections, logs, and device activity, enabling invigilators to efficiently track incidents and overall exam conditions.

## VII. RESULTS

### 1. Snapshots Of the Proposed System

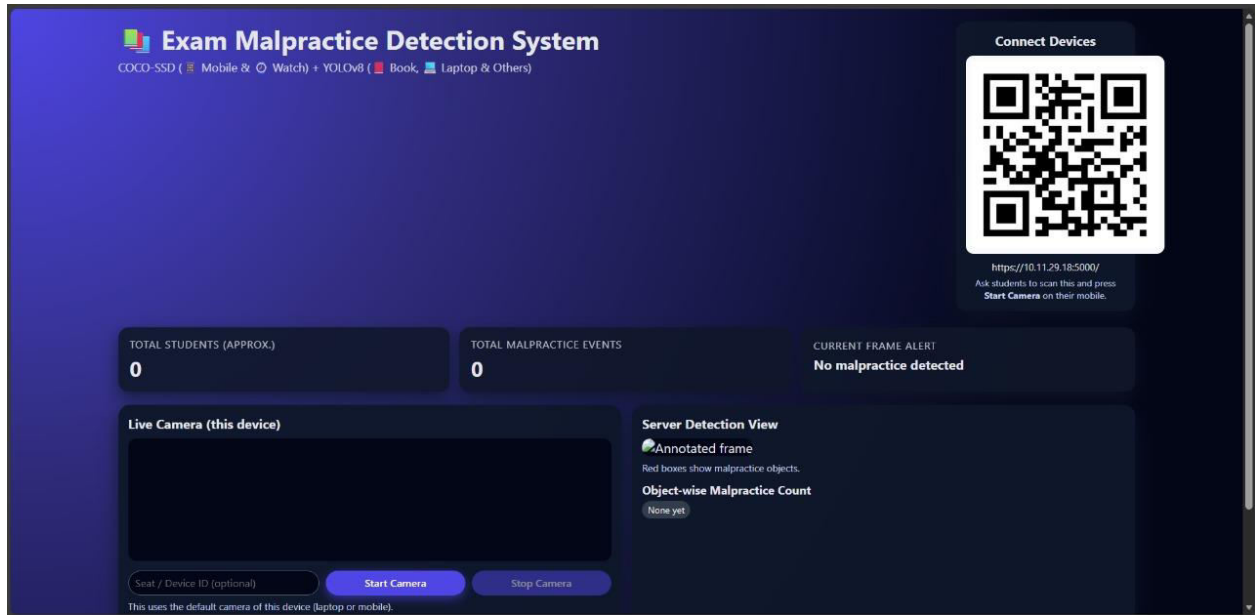


Figure 2: System Dashboard Interface

This figure shows the main dashboard of the Exam Malpractice Detection System, displaying real-time statistics such as total students detected, total malpractice events, and current alerts. A QR code is provided to allow multiple devices to connect instantly and stream their camera feed to the server.

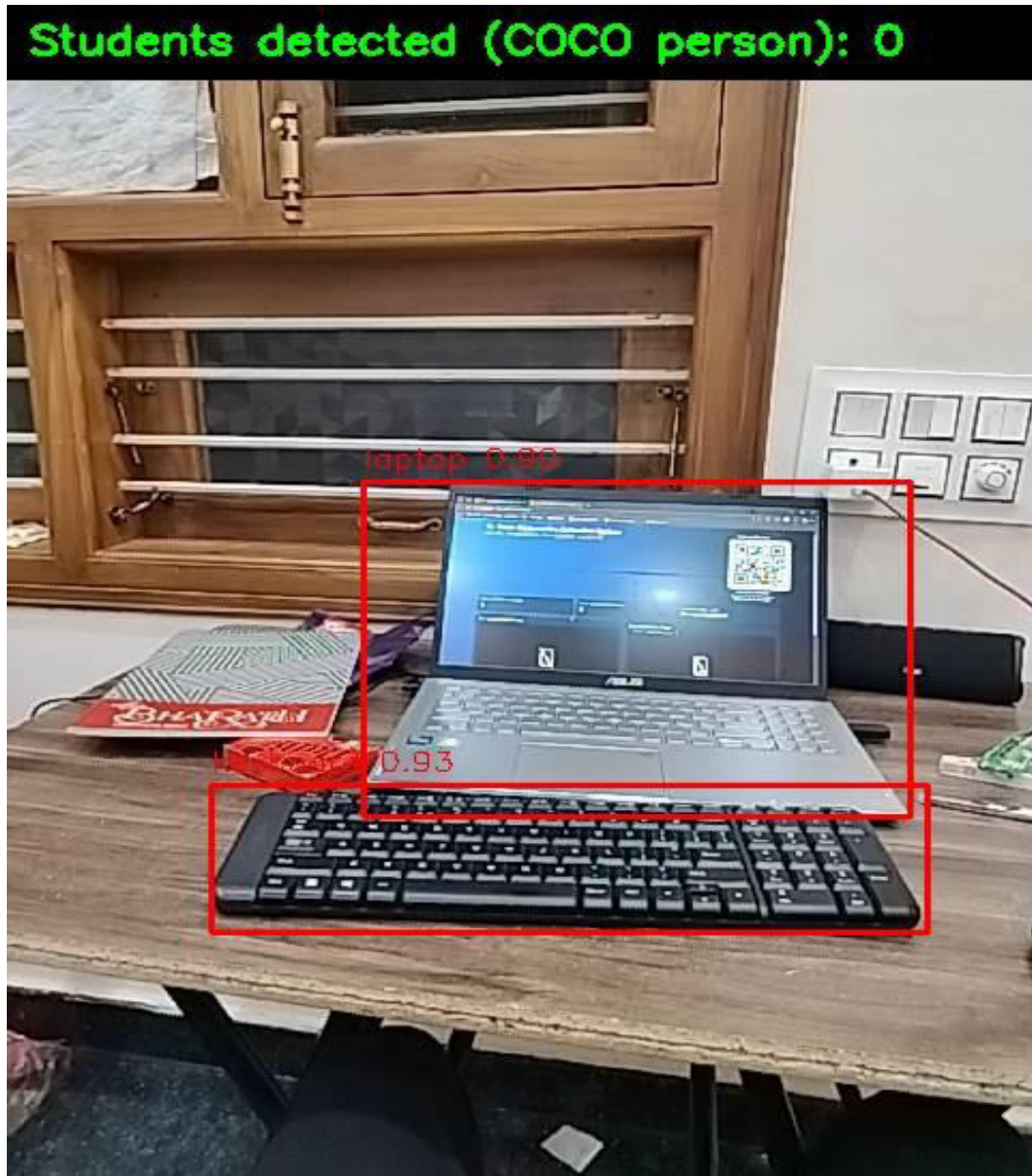
Devices / Seats Overview			
Device / Seat	Student Count	Malpractice Count	Last Seen
dev_saeuciey	1	10	2025-12-08 00:13:17
dev_xvc812jz	1	0	2025-12-08 00:13:16

Recent Incidents		
Time	Device / Seat	Detected Objects
2025-12-08 00:13:17	dev_saeuciey	cell phone (COCO-SSD)
2025-12-08 00:13:14	dev_saeuciey	cell phone (COCO-SSD)
2025-12-08 00:13:13	dev_saeuciey	cell phone (COCO-SSD)
2025-12-08 00:13:12	dev_saeuciey	cell phone (COCO-SSD)
2025-12-08 00:13:11	dev_saeuciey	cell phone (COCO-SSD)
2025-12-08 00:13:10	dev_saeuciey	cell phone (COCO-SSD)
2025-12-08 00:13:06	dev_saeuciey	cell phone (COCO-SSD)
2025-12-08 00:13:05	dev_saeuciey	cell phone (COCO-SSD)
2025-12-08 00:13:03	dev_saeuciey	cell phone (COCO-SSD), cell phone (COCO-SSD)
2025-12-08 00:13:01	dev_saeuciey	cell phone (COCO-SSD), cell phone (COCO-SSD)

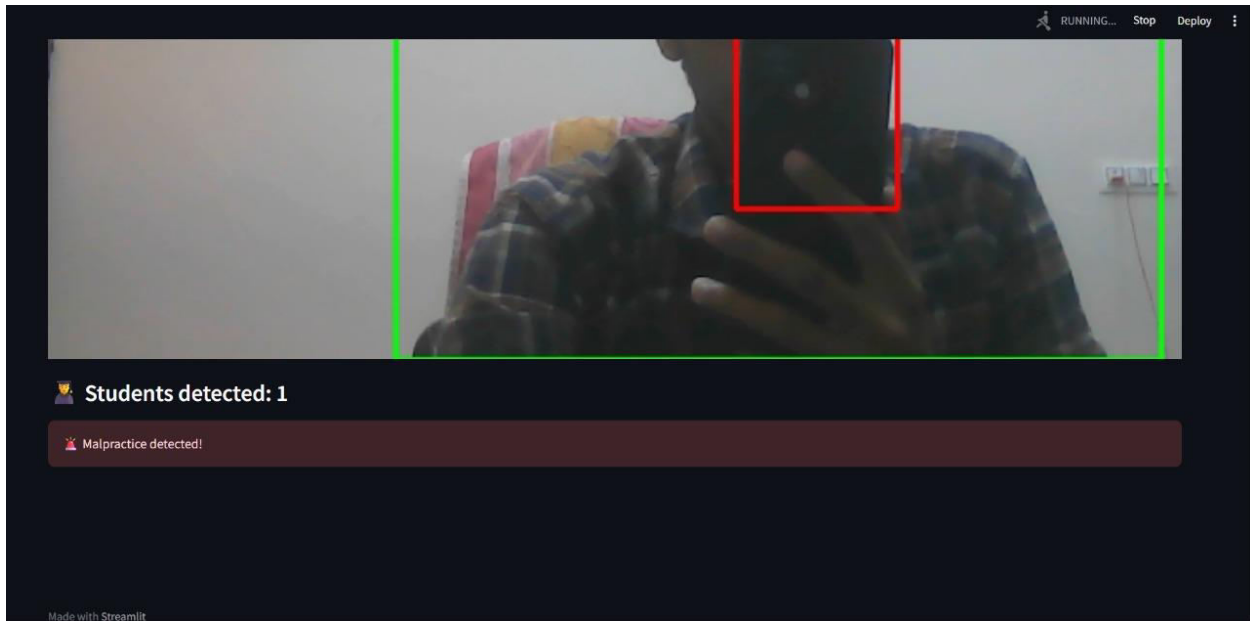
Figure 3: Device and Incident Overview Panel

This figure presents the backend monitoring panel that lists all connected devices along with their student count, malpractice incidents, and timestamps. The recent incidents section logs each detected event with object labels, providing clear audit trails for invigilators.



**Figure 4: Multi-Object Detection Output (YOLO + COCO)**

This annotated frame illustrates the system detecting multiple items such as a laptop and keyboard using YOLOv8. Bounding boxes with confidence scores highlight recognized objects, demonstrating real-time inference accuracy in cluttered environments.



**Figure 5: Live Malpractice Detection Alert**

This figure shows a live camera feed where the system identifies a mobile phone in the student's hand, marking it with a red bounding box. The dashboard immediately raises a malpractice alert, confirming the effectiveness of real-time object detection.

### **VIII. CONCLUSION**

The Exam Malpractice Detection System demonstrates the effective use of artificial intelligence, computer vision, and real-time video processing to support fair offline examinations. By combining COCO-SSD and YOLOv8 models, the system accurately identifies various cheating-related objects while accommodating multiple cameras through laptop, mobile, and external devices. A live dashboard presents student counts, device activity, and detected incidents, supported by automatic screenshot logging for clear evidence. Testing results show stable performance and high detection accuracy across multiple streams. Overall, the system meets all intended objectives and provides a strong foundation for future, more advanced AI-based proctoring solutions.

### **REFERENCES**

- [1] P. M. Newton and K. Essex, "How common is cheating in online exams and did it increase during the COVID-19 pandemic? A systematic review," *Journal of Academic Ethics*, vol. 21, no. 1, pp. 1–20, 2023, doi: 10.1007/s10805-023-09485-5.
- [2] J. A. Ruiperez-Valiente, P. J. Munoz-Merino, G. Alexandron, and D. E. Pritchard, "Using machine learning to detect 'multiple-account' cheating and analyze the influence of student and problem features," *IEEE Transactions on Learning Technologies*, vol. 12, no. 1, pp. 112–122, 2019, doi: 10.1109/TLT.2017.2784420.
- [3] L. Jiao et al., "Assessing student engagement using eye-tracking methods," *Proceedings from educational technology research*, 2019.
- [4] J. Ramberg and B. Modin, "School effectiveness and student cheating: Do students' grades and moral standards matter for this relationship?," *Social Psychology of Education*, vol. 22, no. 3, pp. 517–538, 2019, doi: 10.1007/s11218-019-09486-6.
- [5] G. J. Li, S. N. Li, and Z. Sun, "A theoretical model for understanding motivations behind academic cheating," *Educational Psychology Review*, vol. 32, no. 2, pp. 1–18, 2020.
- [6] N. Valliappan et al., "Accelerating eye movement research via accurate and affordable smartphone eye tracking," *Nature Communications*, vol. 11, no. 1, pp. 1–13, 2020, doi: 10.1038/s41467-020-18360-5.

- [7] K. A. Johnson and A. J. Lang, "Machine-learning-based behavioral pattern analysis for detecting academic dishonesty," *Journal of Educational Computing Research*, vol. 58, no. 6, pp. 1200–1223, 2020.
- [8] S. S. Yadav and S. M. Jadhav, "Deep convolutional neural network based activity recognition techniques," *Journal of Big Data*, vol. 6, no. 1, pp. 1–18, 2019, doi: 10.1186/s40537-019-0276-2.
- [9] S. Grigorescu, B. Trasnea, T. Cocias, and G. Macesanu, "A survey of deep learning techniques for behavior analysis," *Journal of Field Robotics*, vol. 37, no. 3, pp. 362–386, 2020, doi: 10.1002/rob.21918.
- [10] B. Gopal and A. Ganesan, "Real-time deep learning framework to monitor social distancing using improved single-shot detector based on overhead position," *Earth Science Informatics*, vol. 15, no. 1, pp. 585–602, 2022, doi: 10.1007/s12145-021-00758-4.
- [11] A. S. Wright and K. D. Emory, "Enhancing online assessment security using integrated surveillance technologies," *International Journal of E-Learning & Distance Education*, vol. 36, no. 4, pp. 1–15, 2021.
- [12] J. M. K. Enscheda et al., "Hybrid behavioral and machine-learning approaches for effective cheating detection," *International Journal of Advanced Computer Science*, vol. 12, no. 7, pp. 89–98, 2022.





INTERNATIONAL  
STANDARD  
SERIAL  
NUMBER  
INDIA



# INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN SCIENCE | ENGINEERING | TECHNOLOGY

 9940 572 462  6381 907 438  [ijirset@gmail.com](mailto:ijirset@gmail.com)



[www.ijirset.com](http://www.ijirset.com)

Scan to save the contact details