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FACIAL RECOGNITION FOR ONLINE EXAM

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Abstract: Traditional in-person teaching has shifted to online education. To effectively access online tests, human monitoring has been introduced. The common practice of human observation in a physical exam hall is both expensive and labor-intensive. This abstract presents a system that automatically monitors student's activity during online tests using anti-cheat tools. The student's computer camera tracks facial movement and also captures audio to observe student's behavior and any suspicious activity to prevent any misconduct. The system comprises facial recognition, audio detection, facial movement tracking and unexpected behavior detection using Yolo model, Face keypoint detection using custom modules.

Yolo is utilized to analyze and recognize facial features from the student's camera feed facilitating identity verification during online tests. Yolo model is also used for mobile phone detection. The custom module plays a crucial role in detecting unexpected behaviors by identifying patterns indicative of potential misconduct. The Custom modules keypoint detector pinpoints specific facial landmarks thus allowing for a detailed analysis of head movements and students presence. Incorporation of audio module pipeline is implemented which uses an in house algorithm for speech detection during online tests. The objective is to improve the reliability of online exams, ensuring fairness among students.

Index Terms - Online Exam Proctoring, Anti-Cheating Technology, Facial Recognition, Audio and Behavior Analysis, Mobile Detection.

I. INTRODUCTION

Traditional in-person teaching has transitioned to online education, necessitating effective monitoring during online tests. It highlights the challenges associated with human monitoring in physical exam halls, such as cost and labor intensiveness, and introduces the solution: an automated system for monitoring student activity during online tests using anti-cheat tools. This system employs various technologies, including facial recognition, audio detection, and movement tracking, to detect and prevent misconduct. The objective is to enhance the reliability of online exams and ensure fairness among students.

ONLINE PROCTORING

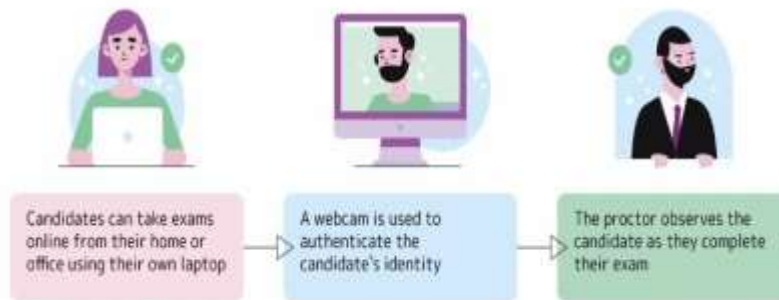


fig I: online proctoring process

II. EXISTING SYSTEM

Overview:

The online exam proctoring system offers a solution to the growing need for effective monitoring of online tests as traditional classroom teaching transitions to online platforms. It introduces a tool designed to automatically oversee student activity during exams, ensuring fairness and integrity in the assessment process. This tool utilizes the student's computer camera to monitor facial expressions and capture audio cues, enabling real-time observation of student behavior. By analyzing facial features and tracking movements, the system can identify and flag any suspicious activity that may indicate cheating or misconduct.

Key components of the system include facial recognition, audio detection, and monitoring of facial movements, all of which work together seamlessly to provide comprehensive surveillance during online exams. The use of advanced technology, such as Yolo, enhances the system's capabilities by enabling accurate facial recognition and mobile phone detection. Additionally, custom modules play a critical role in detecting unexpected behaviors by analyzing patterns that may suggest potential misconduct.

The system's audio module pipeline incorporates a specialized algorithm for speech detection, allowing it to identify any suspicious verbal cues uttered by students during exams. This further strengthens the system's ability to maintain the integrity of online assessments. Overall, the proposed system aims to enhance the reliability of online exams by implementing robust monitoring measures. By leveraging advanced technologies and innovative approaches, it seeks to address the challenges associated with online test monitoring, ultimately ensuring a secure and equitable testing environment for all students.

Existing System Architecture: Smart Online Exam Proctoring Assist for Cheating Detection introduces a new way to detect cheating in online exams. It analyzes exam videos to find four types of cheating behaviors and uses a pre-trained model to classify them. This method achieves high accuracy, up to 97.7%, and is cost-effective and easy to use. It also tracks four types of events, which is unique compared to other methods. Overall, the paper's contributions include proposing an effective cheating detection technique, achieving high accuracy, and providing a practical solution for online exam monitoring.

Smart Online Exam Proctoring Assist for Cheating Detection starts with user authentication and recording the exam. The recorded video is then analyzed for cheating behaviors, such as eye and head movements. It is transformed into a feature vector and fed into a pre-trained model for cheating detection. This systematic approach ensures thorough monitoring and detection of cheating throughout the online exam process.

Smart Online Exam Proctoring Assist for Cheating Detection relies on analyzing exam videos, which may raise privacy concerns. It also lacks discussion on potential challenges in implementing the technique in real-world scenarios and comparison with existing tools. The dataset used may not fully represent real-world scenarios, and the limitations of the classification model are not explored. Addressing these limitations would improve the effectiveness of the proposed technique in real-world online exam environments.

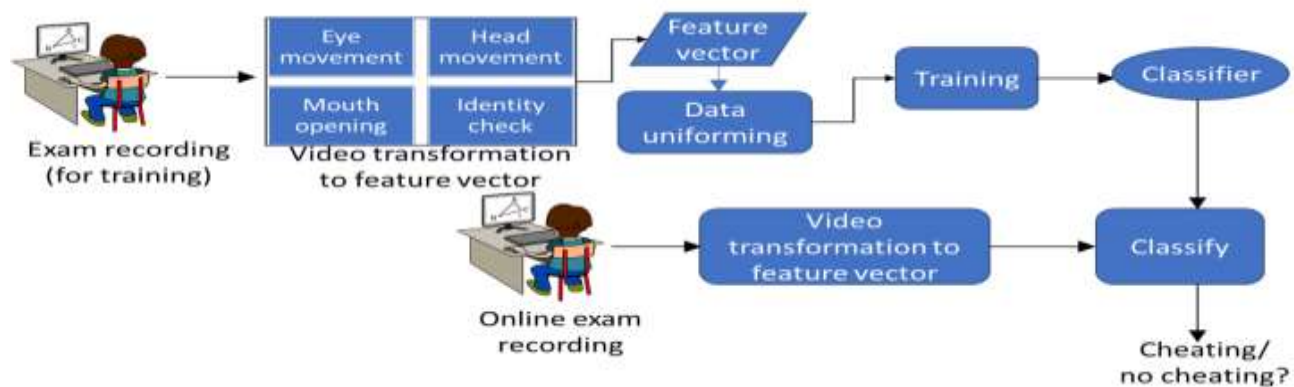
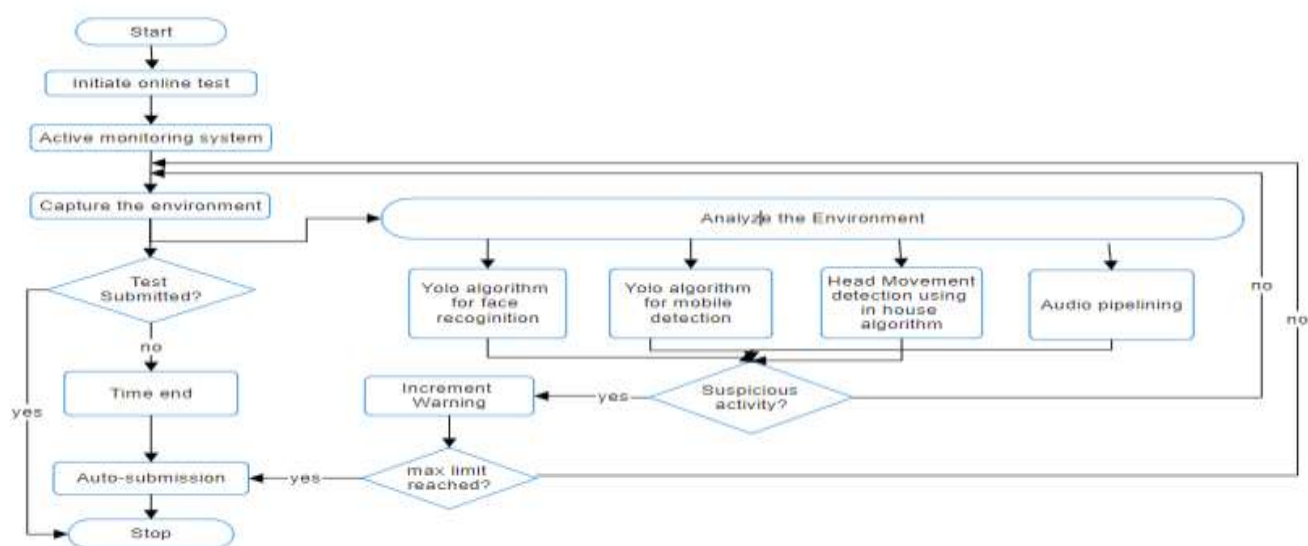


fig II: existing system architecture

III. PROPOSED SYSTEM

Facial recognition for online exam introduces a system designed to monitor students during online tests using an anti-cheat tool. It addresses the limitations of traditional monitoring methods by incorporating facial recognition, audio detection, and movement tracking. By leveraging advanced technologies like Yolo and custom modules, the system aims to effectively detect potential misconduct. This contributes to improving the integrity of online exams and ensuring fairness among students. In the facial recognition for online exam, the student's computer camera tracks facial movements and captures audio during online tests. These data are then processed through various modules for facial recognition, audio detection, and movement tracking. Yolo model is used to analyze facial features and detect mobile phones, while custom modules focus on specific facial landmarks for detailed analysis. The system's goal is to enhance the reliability of online exams by preventing misconduct and maintaining fairness.

fig III: proposed system architecture



IV. RESULTS

Face authentication: We have used a python deepface model that uses CNN to process examiners face images and convert them into high-dimensional vectors; thus, we get a high-accuracy face detection result.

Head movement tracking: Students head movement is tracked successfully with high accuracy of 98% in 5 directions, i.e., up, down, left, right, and forward.

Eye gazing: We have successfully achieved 90% accuracy in detecting the eye movements of the examinee while the examinee looks towards the screen, blinks, or looks right or left.

Mobile detection: Cell phone detection is achieved with an accuracy of 97% when a cell phone is present in examinees camera frame.

Audio detection: Real-time audio data analysis is successfully conducted in the examinee's environment with varying frequencies, achieving an accuracy of 99%.

Functionalities	Accuracy (in percentage)
Face authentication	98
Mobile detection	97
Eye gazing	90
Audio detection	99
Head movement tracking	98

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