

AUTOMATED PROCTORING SYSTEM TO DETECT ANOMALOUS BEHAVIOUR IN E-LEARNING DURING TIMES OF CRISIS

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Introduction:

Academics have shifted to online mode. This poses a major challenge not only from a learning point-of-view but also from the perspective of examinations. Conducting examinations without any wrongdoing is a major task to be solved. In India, the number of internet users has nearly doubled in the past 6 years. This proved to be a boon for academics as many students could continue their education. Manual online proctoring in the remote examination is a difficult task as many students cannot be invigilated at the same time. During manually proctored examinations at the centers, a teacher can physically monitor students using all the senses online examinations restrict supervision as the teacher is not physically present at the location. A good remote online proctoring system should facilitate movement and sound detection. Even with several measures in place like the novel method proposed to invigilate the students electronically during examinations conducted at remote locations, chances for high rate of fraud in the online examinations makes monitoring harder.

In the paper done by Yousef Atoum et al[1]., we present a multimedia analytics system that performs automatic online exam proctoring. The system hardware includes one webcam, one wearcam, and a microphone, for the purpose of monitoring the visual and acoustic environment of the testing location. The system includes six basic components that continuously estimate the key behavior cues: user verification, text detection, voice detection, active window detection, gaze estimation and phone detection. By combining the continuous estimation components, and applying a temporal sliding window, we design higher level features to classify whether the test taker is cheating at any moment during the exam.

Objectives:

- **Registration:** Students register on a portal for the first time submit their basic details.
- **Face Scoping:** A Webcam is installed into the computer of a student or the front camera if the student is giving an exam on a computer, using Face Recognition it checks whether the student is looking at Screen or not.
- **Head pose detection:** In MCQ-based exams where there is no need for pen and paper, the head position of students will be analyzed and if it appears that a student is looking away from the screen then screen shot will also be saved.
- **Multiple Person detection:** If more than one person is seen in the frame then its screen shot will be saved in the database as malpractice.
- **Mobile phone detection:** If a student is found using a mobile phone, then its screen shot will be saved in the database as malpractice.
- **Speaking Check:** if student makes mouth movement, then its screen shot will be saved in the database as malpractice.
- **Eye Tracking:** if student makes movement, then then its screen shot will be saved in the database as malpractice.

Methodology:

1. Registration of students using personal details on the platform.
2. The Proctoring System starts when a student starts the exam.
3. Image of the student will be taken every seconds.
4. Multiple Face detection and no face available on the screen will also be captured and stored.
5. Head position tracking will be used in certain exams which don't require pen and paper.
6. If a student is found doing fraudulent activities the camera automatically captures the image and stored in database.
7. The movement of eyes and mouth will be checked and captured regularly whenever test taker tries to move his/her eyes of mouth.
8. If any candidate is found to be suspicious, a manual check can be done from the database.

Architecture Diagram:

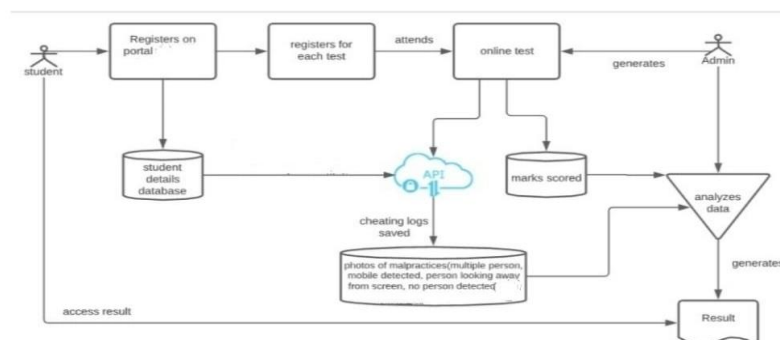


Figure 1: Represents The system Methodology.

Conclusion:

After implementing all objectives with most cost effective and reliable algorithms such as Haar Cascade, CNN, LBPH etc. System has overcome all the disadvantages of previous system and can be used in real time. Combining multiple features as one system Leads to library/ Module related errors. But it is more reliable then traditionally used “Live proctoring” and “Record and watch proctoring”. As we all know every project gets outdated with time, so following are the feature that can help to keep up with time.

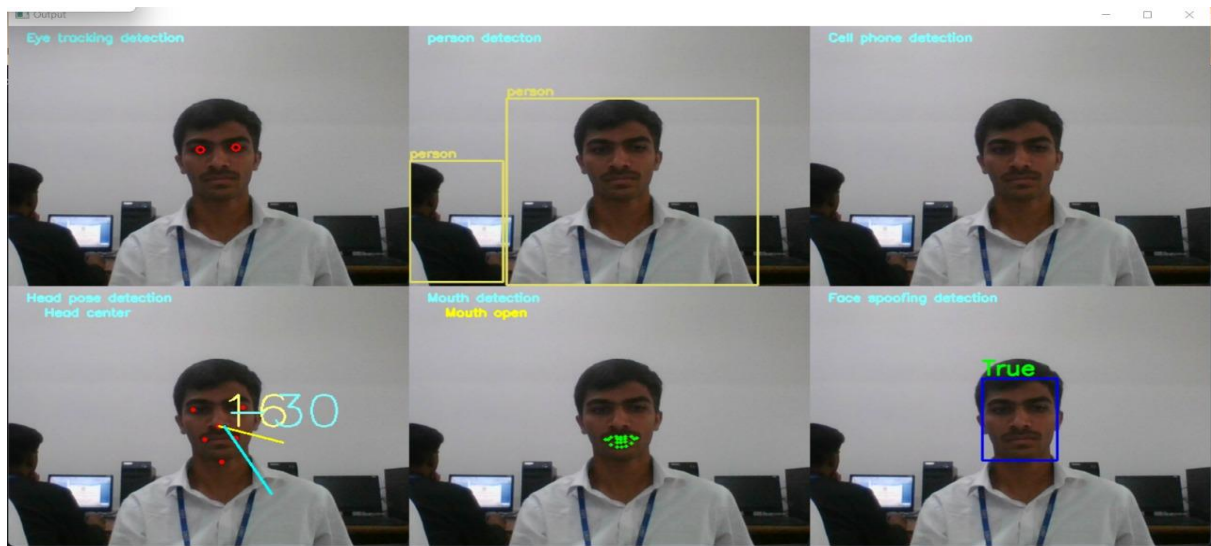


Figure 2: Results of various features.

Scope for future work:

Although we have covered most of major objectives of our project which help in smooth and efficient functioning of online exam mode. But there are many other aspects need to be covered as future work which will help in more accurate tool to conduct exams, some of the works for future are.

- i. Voice detection: This feature helps detect any type of noise, which helps reduce the risk of misconduct by using any type of speech / voice.
- ii. Brower Lock system: This system does not allow you to open any type of tab in any browser, as testers can take the help of other sources using online browsers.
- iii. Biometric Authentication: It is a special feature to authenticate a candidate using any form of government or recognized identity for verification, Fingerprint scanner can also be used as part of authentication in critical situations.
- iv. 3600 Camera proctoring/surveillance: In normal webcams, the camera captures less than 1800 and it is not enough to detect any malicious chits or notes behind webcams. We need to adopt a 3600 camera for surveillance to prevent this kind of fraud.