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AI Proctoring for Online Assessments

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ABSTRACT: Recently remote learning has boomed. But there has been no proper solution to academic examinations. Some universities collected assignments, where students can copy and paste from the web, while some have implemented remote proctoring, where a manual proctor keeps watching on student activities. If the way we live is to be the new normal there's a requirement to seek out some solution. during this paper, we have proposed an answer to develop an AI-based integrated system which will help in preventing cheating in examinations. The system catches fraudulent activities and stores the proof. This system is going to be secure andcost-effective.

KEYWORDS*:* remote learning, proctoring, online tests.

I. INTRODUCTION

Academics have shifted to online mode. This poses a major challenge not only from a learningpoint-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 usershasnearlydoubledinthepast6years.Thisproved to be a boon for academics as many students could continue their education. This also facilitated examinationstogoonlinewhichbroughttheconceptof online proctoring at the academic level. Web based administering alludes to a computerized type of invigilation utilizing cutting edge observing software. A proctored exam allows the invigilators to invigilate remotely. They use video, audio, and various anti- cheating features to maintain the exam's credibility. 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. They can notice the sounds, movements of students and can easily ensure smooth conduct of the event. Online examinations restrict supervision as the teacher is not physicallypresentatthelocation.Agoodremoteonline proctoring system should facilitate movement and sound detection.

II. PROBLEM STATEMENT

The expanded ubiquity of online assessment presents advantages and difficulties to understudies, workforce, and scholarly foundations. Geographic areas and time regions not, at this point present hindrances for understudies to give tests since assessments can be conveyed almost anywhere on the planet with a web association and secure software. So, the idea is to create an AI system that will monitor the student with the webcam and microphone and with that teacher can monitor many students at a time. The system should also keep a record of probable malpractices. The logs of malpractices can be used to manually verify the student in case of suspicion. The system should also keep track of tests such that any kind of power failure must not interrupt the test and students can re-login and start from the point where the test was closed.

III. LITERATUREREVIEW

In paper [2] the authors have highlighted that Scholarly untruthfulness in the web-based swindling climate of distance training has acquired foothold in the previous decade. With a couple of basic keystrokes, understudiescan track down a wide cluster of online administrations for recruit to compose research papers, complete schoolwork tasks,orenlistforthebenefitoftheunderstudyonrecordto take the whole online course. While foundations in advanced education have considered online to be as a vehicle to expand understudy enlistments adding to their primary concern, the quantity of Internet swindling organizations to help scholarly unscrupulousness has additionally expandedquickly. Difficulties managing scholarly untruthfulness in theonline region have gotten more widespread, leaving personnel and school overseers in conflict, how to forestall such conduct in both conventional and onlineclasses.

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In paper [1] This paper was planned to give a reasonable correlation of highlights of internet delegating frameworks right now in activity as of this date. A program should also make a significant effort to establish rules and policies for test security and make sure that examinees and others are aware of them. It should provide clear and public information about how and where infractions and attempts to compromise the integrity of a test can be reported, including anonymous channels. Data collected need to be secured against hacking and theft.

In paper [4] The motivation behind this examination was tothinkaboutonlinetestresultsfromadministeredversus non-delegated online tests. Test execution of 147 understudies tried out various segments of an online course was contrasted utilizing direct blended impacts models and almost a large portion of the understudies having no delegating and the rest of to utilize internet administering programming. Understudies scored on normal 17 focuses lower and utilized altogether less time in online tests that utilized administering programming versus non-delegated tests. Huge evaluation difference and diverse time use happened on various tests, both across and inside segments of similar course where a few. Understudies utilized test delegating test proctoring software and others didn't.

IV. DRAWBACKS IN EXISTING SYSTEM

Existing online systems have one manual proctor watching 10 students simultaneously which is not cost-effective, and we have to rely on a manual proctor sitting at home and monitoring students. If we scale the traditional online proctoring systems, then we need many proctors to conduct an examination. We have to rely on the proctor's ability to catch malpractices and when the proctor is focusing on one student, other students can cheat at that time. So simultaneous proctoring is not achieved.
The traditional classroom proctoring is also less effective as the teacher to student ratio is around 1: 50. And if a student misses an exam rescheduling exam for that particular student is resourceintensive.

V. PROPOSED SYSTEM

In this paper, we have proposed a web-based system to identify, and analyze the malpractices carried out by students during online examinations using Artificial intelligence and voice recognition.

Face Recognition: A Webcam is installed into the computer of a student or the front camera if the student is giving an exam on a smartphone, Using FaceRecognition the student is recognized and if the face matches with the stored face image, then the student is verified and allowed to give the exam. During the exam the image of the student is continuously taken and if the face is not matched with the stored image its log is saved in the database.

Multiple face detection: If more than one person is seen in the frame then it will also be logged in the database as malpractice.

Head pose estimation: 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 its log will also besaved.

Mobile Phone detection: If a student is found using a mobile phone it will also be logged in the database as a malpractice.

Voice detection: A student can use voice assistants to cheat in the exam for this we take voice samples of the student's environment through the microphone and if the frequency of sound is greater than the threshold it is alsologged.

User-friendly Interface: Easy to use interface for students, admin can add new tests easily and can generate results. Admin can also check malpractice logs for manual verification of logs if a student applies for re-evaluation on being disqualified on basis of malpractice detection.

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VI. METHODOLOGY USED

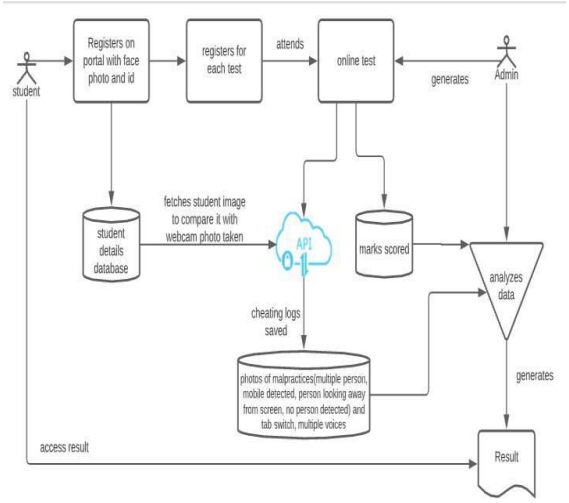

Fig 1. System Methodology

1. Registration of students using personal details and face image on the platform.
2. Registration of each exam with the latest face image which will be verified with an image stored in DB.
3. The Proctoring System starts when a student starts the exam.
4. Tab switching will be logged.
5. Image of the student will be taken every 10 secs and matched with an image taken before the exam if theimage does not match it will also be logged.
6. Multiple Face detection and no face available on the screen will also be logged.
7. If multiple voices are detected it will also be logged.
8. Head position tracking will be used in certain exams which don't require pen and paper e.g. verbal ability.
9. If a student is found doing fraudulent activities in logs it will lead to disqualification.
10. Students will be given a chance to appeal for manual verification in which logs will be checked manually to ascertain the claim.

VII. ALGORITHMS

A. Local Binary Pattern Histogram Algorithm

The Local Binary Pattern Histogram (LBPH) algorithm is a simple solution to the problem of face recognition, which can identify both front and side. However, the LBPH algorithm recognition rate under conditions of diversification of illumination, the variability of expression, and deflection of attitude is decreased. Local Binary Pattern (LBP) is a straightforward yet effective surface administrator which names the pixels of a picture by thresholding the neighbourhood of every pixel and thinks about the outcome as a binary number.

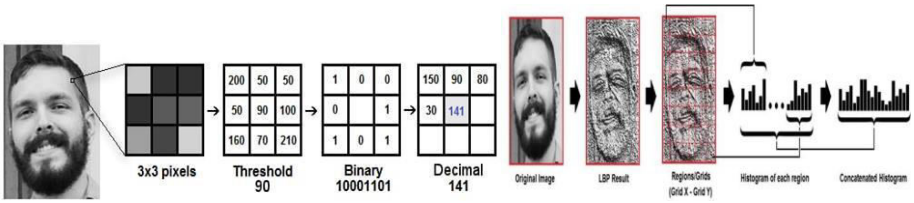

Fig 2.

Fig 3.

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B. Multi-Person, No person and PhoneDetection

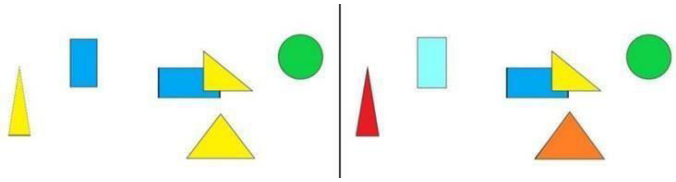

Fig 4.

YOLOv3 pre-trained model can be used to classify 80 objects and is super-fast. It has 53 convolutional layers witheachofthemfollowedbyabatchnormalizationlayer and a leaky RELU activation. YOLOv3 achieves a top-1 accuracy of 76.5% and a top-5 accuracy of93.3%.

VIII. RESULT ANDDISCUSSIONS

A Robust System that detects online exam cheating practices like sitting with a partner, using a mobile phone, switching tabs to look for answers online.

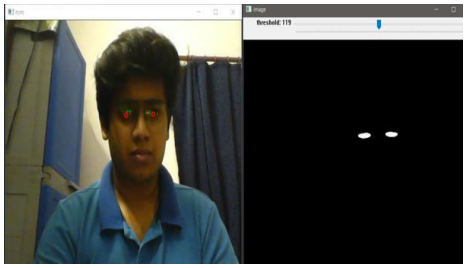

Fig 5. Eye Tracking

Fig5 shows the eye tracking module which detects the eyeballs of the test-taker and the threshold window alongside it is used to detect eyeballs under different lighting conditions.

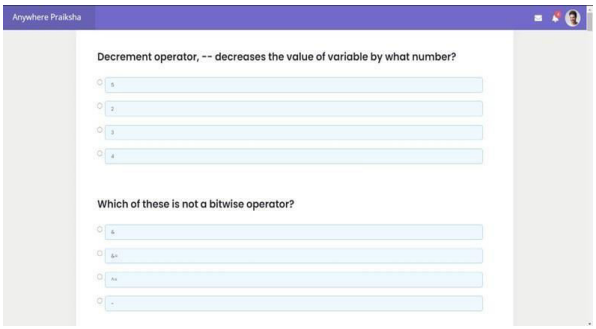

Fig 6. Test screen

Fig 6 shows the test screen with photos of the student taken in the background.

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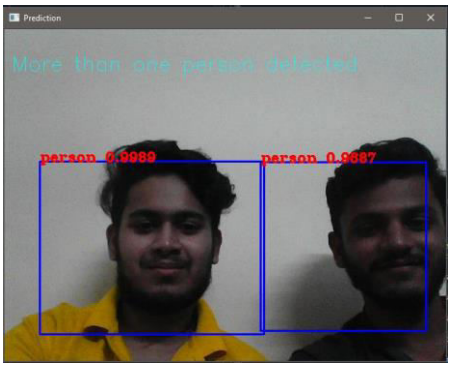

Fig 7. Multiple faces detected

Fig 7 shows that more than one person is giving the exam and logs it as malpractice. If more than one person is detected in the frame then it is logged as malpractice and all the persons detected are marked in blue rectangular boxes and the persons are detected using the yolo v3 model implemented on coco dataset.

Fig 8. Mobile phone detected

Fig 8 shows that a student is using a mobile phone during the examination and logs it as malpractice.

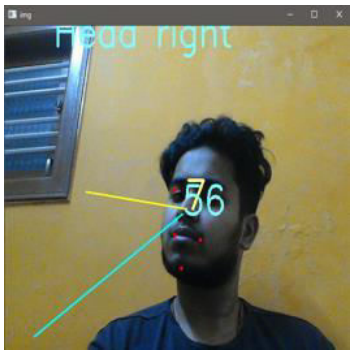

Fig 9. Head pose estimation

Fig 9 shows that a student is looking outside the computer screen and logs it as malpractice.

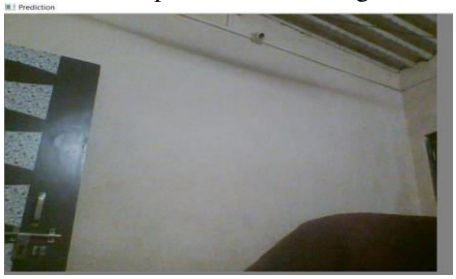

Fig 10. No person detected

Fig 10 shows that there is nobody in the frame and logs it as malpractice.

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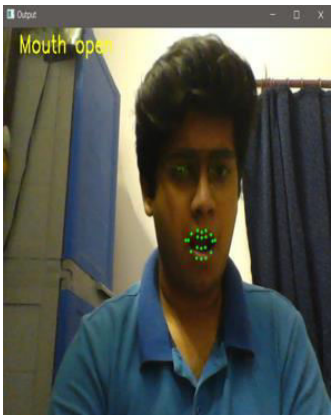

Fig 11 Mouth detection

Fig 11 shows the mouth detection module and it detects whether the student taking the examination is opening his/her mouth while taking the assessment and logs it as malpractice if the mouth is open.

IX. CONCLUSION

There is a high demand for AI proctored systems as online proctoring has increased in recent times. It is possible to create an AI proctoring system with high accuracy. Logging fraudulent activity is important to handle disputes. Making a proctoring system that is mobile compatible is the need of the hour as most students don't have computers. Through this project, we will try to show that online proctoring is the future and using online proctoring cheating in exams can be reduced drastically.

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