

AI BASED PROCTORING SYSTEM FOR ONLINE TESTS

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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. This also facilitated examinations to go online which brought the concept of 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 physically present at the location. A good remote online proctoring system should facilitate movement and sound detection.

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.

For the past few years, e-learning has become popular across countries because of its flexibility, availability and user friendliness. As far as online examinations are concerned; the major challenge faced by the research community is the proctoring techniques used. By continuously analyzing the user attention level, as a system for determining the quality of courses, an automated system is essential to handle the proctoring difficulty.

Objectives:

In this project we are going to perform the following in online examination:

1. Candidate verification and attendance management.
2. Detection of mobile phones nearby to the student and take necessary actions.
3. Perform voice recognition during the online exam to detect malpractice.
4. In online exam, the system will provide a single portal for logging in, accessing question paper, chat window to communicate with examiner and to upload answer sheet using the scanner which is embedded in the portal.
5. Avoiding candidate from opening/accessing any other application during the online exam in the desktop or mobile.

Methodology:

The system design mainly consists of:

1. Image Collection
2. Image Preprocessing
3. Image Segmentation
4. Feature Extraction
5. Training
6. Classification

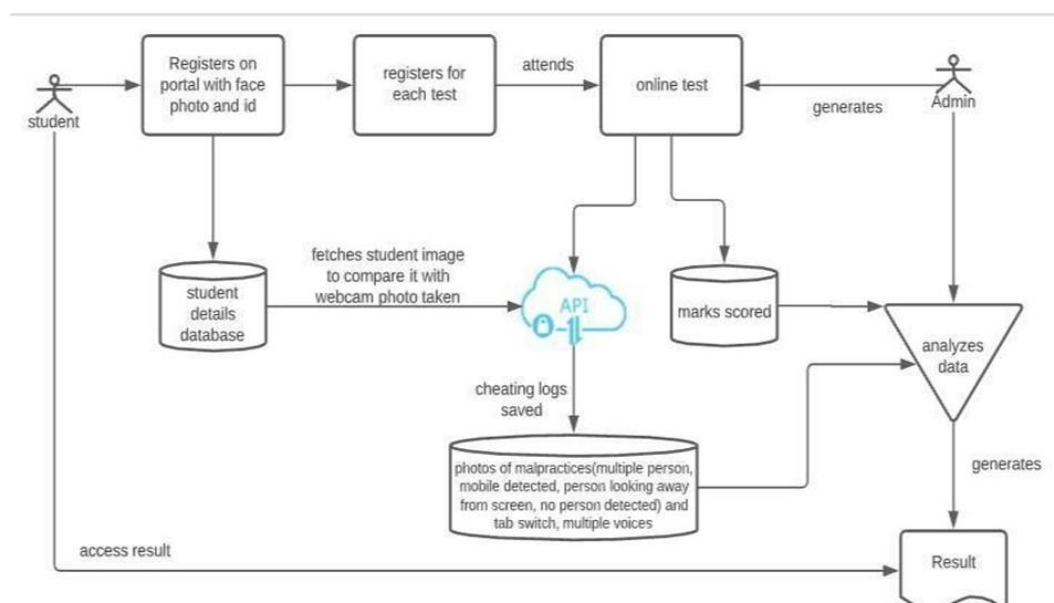


Figure 1: System Architecture

1. Image Collection

Input to proposed system is the real time video. The real time video is captured from the web cam of the user's pc or laptop.

2. Image Preprocessing

Goal of pre-processing is an improvement of image data that reduces unwanted distortions and enhances some image features important for further image processing. Image pre-processing involves three main things a) Gray scale conversion b) Noise removal c) Image enhancement.

a. Grayscale conversion

Grayscale image contains only brightness information. Each pixel value in grayscale image corresponds to an amount or quantity of light. The brightness graduation can be differentiated in grayscale image. Grayscale image measures only light intensity 8-bit image will have brightness variation from 0 to 255 where '0' represents black and '255' represents white. In grayscale conversion color image is converted into grayscale image. Grayscale images are easier and faster to process than coloured images. All image processing technique are applied on grayscale image. In our proposed system coloured or RGB image is converted into grayscale image.

b. Noise Removal

The objective of noise removal is to detect and remove unwanted noise from digital image. The difficulty is in deciding which features of an image are real and which are caused by noise. Noise is random variations in pixel values. In our proposed system we are using median filter to remove unwanted noise. Median filter is nonlinear filter, it leaves edges invariant. Median filter is implemented by sliding window of odd length. Each sample value is sorted by magnitude, the center most value is median of sample within the window, is a filter output.

c. Image Enhancement

The next step after image pre-processing was to segment the object from the surrounding image. Since a clear colour distinction existed between the object and the face, thresholding was very suitable for the task. A black and white image was produced with its contrast adjusted to provide better segmentation.

3. Image Segmentation

The next step after image pre-processing was to segment the object from the surrounding image. Since a clear colour distinction existed between the object and the face, thresholding was very suitable for the task. A black and white image was produced with its contrast adjusted to provide better segmentation.

4. Feature Extraction:

Feature extraction plays an important role in extracting information present in given image. Here we are using GLCM for texture image analysis. GLCM is used to capture spatial dependency between image pixels. GLCM works on gray level image matrix to capture most common feature such as contrast, entropy, energy, homogeneity, correlation, ASM, cluster-shade. The purpose of feature extraction (glcm) is to suppressed the original image data set by measuring certain values or features that helps to classify different images from one another.

5. Training

Create training dataset from images taken in the time of registration. Train classifiers on the created training dataset. Create testing dataset in temporary folder. Predict results from the test cases. Plot classifiers graphs. Add feature-sets to test case file, to make machine learning models more accurate.

6. Classification

A Convolutional Neural Network (ConvNet/CNN) is a Deep Learning algorithm which can take in an input image, assign importance (learnable weights and biases) to various aspects/objects in the image and be able to differentiate one from the other. The pre-processing required in a ConvNet is much lower as compared to other classification algorithms. While in primitive methods filters are hand-engineered, with enough training, ConvNets have the ability to learn these.

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. 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, leaving the seat during the examination, and logs them with a user-friendly mobile and web compatible examination portal.

Scope for future work:

In this project, 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, our project goal is to design and implement malpractice detection system for online and offline exam. This system can detect whether the students are referring answers online or from the stored resources in desktop or mobile. 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.