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Online Exam Portal Using Machine Learning and Face Detection

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Abstract: ***With the expansion of Internet and technology over the past decade, E-learning has grown exponentially day by day. Cheating in exams has been a widespread phenomenon all over the world regardless of the levels of development. Therefore, detection of traditional cheating methods may no longer be wholly successful to fully prevent cheating during examinations. Online examination is an integral and vital component of E-learning. Student's exams in E- learning are remotely submitted without any monitoring from physical proctors. As a result of being able to easily cheat during e-exams, E-learning universities depend on an examination process in which students take a face-to-face examination in a physical place allocated at the institution premises under supervised conditions, however these conflicts with the concept of distant E-learning environment.***
Keywords: Machine Learning, Face Recognition, Tkinter, Haar Cascade, Online Exam

I. INTRODUCTION

Today's pandemic situation has transformed the way of educating a student. Education is undertaken remotely through online platforms. In addition to the way the online course contents and online teaching, it has also changed the way of assessments. In online education, monitoring the attendance of the students is very important as the presence of students is part of a good assessment for teaching and learning. Educational institutions have adopting online examination portals for the assessments of the students. These portals make use of face recognition techniques to monitor the activities of the students and identify the malpractice done by them. This is done by capturing the students' activities through a web camera and analysing their gestures and postures. Image processing algorithms are widely used in the literature to perform face recognition. Despite the progress made to improve the performance of face detection systems, there are issues such as variations in human facial appearance like varying lighting condition, noise in face images, scale, pose etc. that blocks the progress to reach human level accuracy. The aim of this study is to increase the accuracy.

II. LITERATURE SURVEY

1) Paper Name: Application of College English Listening Online Examination Platform Based on Streaming Media Technology. Author: Qiuyan Li Institute of Information Technology of GUET Guilin, China. Abstract : As one of the key contents of the college English test, listening online examination has become one of the required questions on the online examination platform. Due to the large size of the listening file, how to ensure the smooth playback of the listening file has become a problem that must be solved in the online examination. This paper focuses on solving college English listening online examination by using streaming media technology. It gives an overview of streaming media technology, and proposes the use of streaming media technology to build the college English listening online examination platform. It can ensure the smooth reception and playback display of the terminal data stream of the listening online examination.
2) Paper Name: Research on Abnormal Behavior Detection of Online Examination Based on Image Information. Author: Senbo Hu1 , Xiao Jia2 , Yingliang Fu3 Dalian Maritime University College of Information Science and Technology Dalian, Liaoning. Abstract : Over the past few years, online exams have become popular because of their flexibility, usability, and user friendliness. In term of online examinations, the abnormal behavior monitoring of the examiner during the examination is one of the major challenges. The traditional monitoring programs mainly focus on the identity of testers and lack the effective identification of abnormal behaviors of testers. Faced with the monitoring of abnormal behaviors in online examinations, this paper proposes to obtain the information of the examinee's head posture and mouth state through the webcam and to discriminate the abnormal behavior of the examiners during the online examination. This system has been tested in an online test scenario, making it easy to monitor the test. Experiments show that the proposed method performs better than the existing systems.

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3) Paper Name: Impersonation Detection in Online Examinations Author::Pooja Mahesh Student, ECE – Design Manufacturing IIITDM - Kancheepuram Chennai, India Abstract: —In today's world that witnesses an everchanging scenario in the technical fields, the concept of an "examination" too has changed. From the traditional methods of pen-and-paper and Optical Mark Recognition (OMR), it has evolved into 'Online Examinations', which are a lot more flexible, timesaving as well as require much fewer resources. However, they have certain drawbacks too. While the uncertainties involved in the working of the electronic equipment and 'server break-down' do affect the examination, the developments in technology have helped overcome these. However, the most important problem faced by online examinations is the authenticity of the student who is taking it. Impersonation, as it is called, is in fact, due to the negligence (or in certain cases due to the cooperation) of the human factors that are present at the examination Centre. In this paper, the aim is to eliminate these human factors, to ensure that impersonation, if any, can be easily detected, and the impersonator is not allowed to take the examination. For this purpose, two- step biometric verification of the candidate is done, one of which extends throughout the duration of the examination. In this manner, impersonation can be avoided.

4) Paper Name: College English Online Examination System Design Based on Cloud Computing Platform Author: : Qiuyan Li Abstract :—With the deep integration of information technology and online teaching, online examination will gradually become the dominant form of college examination. College English, as a public basic course in colleges and universities, has the characteristics of large number of examinees, large scale and large load. Focusing on this issue, this paper starts with an overview of the feasibility and inevitability of college English online exam. It proposes a plan to build a systematic, integrated, intelligent and extensible college English online exam on the cloud computing platform by using the open-source Hadoop framework.

5) Paper Name: The Research and Design of Online Examination System Author: Zhang Yong-sheng1, 2, Feng Xiu-mei1, 2, Bao Ai-qin3 Abstract: With the development of society, different kinds of examination appear constantly. The way of traditional examination has been unable to meet the needs of the developing education informationization. The role was divided into function modules by analyzing users' requirement. An online examination system based on Web was designed, which adopted B/S mode, used the IDEA as the coding tool, combined with the MySQL database and related technology. It realized the user login, security authentication, question bank management, test paper management, online examination, announcement, sourcing, check results etc.

III. PROPOSED SYSTEM

We proposed a system that includes, among other things, the candidate's surrounding environment, a liveliness check, and a face comparison of the candidate with his or her image. The evaluator can use this application to double-check the candidate's activity at any time during the examination. The following characteristics are included in the online test that was built for taking an online test, when compared to the current system, the suggested system will be faster and more efficient Because the simulator performs the calculations and evaluations, the result will be very precise and correct, and it will be declared in a very short period of time. The proposed solution is extremely safe because there is no risk of question paper leaking because it is entirely dependent on the administrator, the records of applicants who appeared and their marks are maintained and can be backed up for future use.

IV. MOTIVATION

The basic idea of this project is to develop an application which can provide security as well as to develop a software for automatic MCQs exam evaluation We get motivated of existing system. We have to match user object with database image using Scale invariant feature transform. In that system first we have to capture the face then pre-processing on that video /image then select feature extraction and compare face object with database face and get the result for register face and then after that MCQ test will be start. The basic idea of this project is to develop an application which can provide security as well as to develop a software for automatic MCQs exam evaluation.

V. RESEARCH METHODOLOGY

Haar Cascade: It is an Object Detection Algorithm used to identify faces in an image or a real time video. This include models for face detection, eye detection, upper body and lower body detection, license plate detection etc. The algorithm uses edge or line detection features proposed by Viola and Jones. The algorithm is given a lot of positive images consisting of faces, and a lot of negative images not consisting of any face to train on them.

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The Haar Cascade algorithm is to find out the sum of all the image pixels lying in the darker area of the haar feature and the sum of all the image pixels lying in the lighter area of the haar feature. And then find out their difference. Now if the image has an edge separating dark pixels on the right and light pixels on the left, then the haar value will be closer to 1. That means, we say that there is an edge detected if the haar value is closer to 1.

Among of all other object detection method Haar feature-based cascade classifier is the most effective method. For training the classifier of this algorithm need a lot of image of faces and without faces. Image of faces are called 'Positive Image' and image of without faces are called 'Negative Image'. The value of each feature is calculated by doing the subtraction between the sum of Pixels of white rectangle and black rectangle. Haar feature is shown in figure 1.

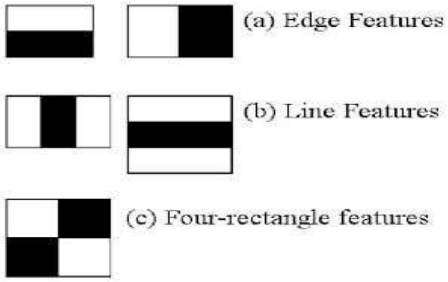


Fig.1 Haar like Features

Figure 2 shows the feature calculation from the sum of the pixels between white and black rectangle. First two pictures of the first row show the two good features. First picture seems to focus on the properties of eyes and second picture focus on the properties of nose.



Fig. 2 Haar like Features (Extended)

VI. ARCHITECTURE

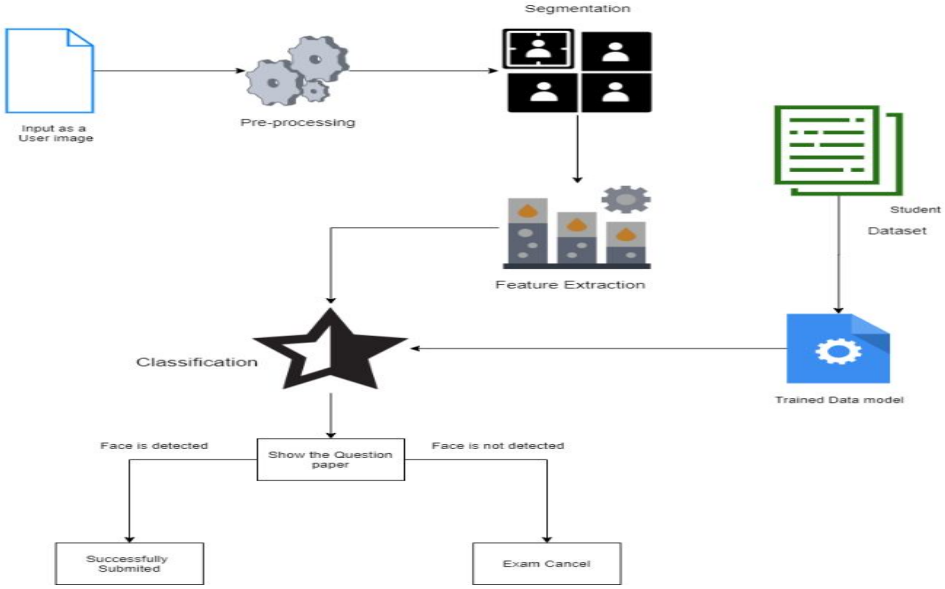


Fig.3 Architecture

VII. IMPLEMENTATION

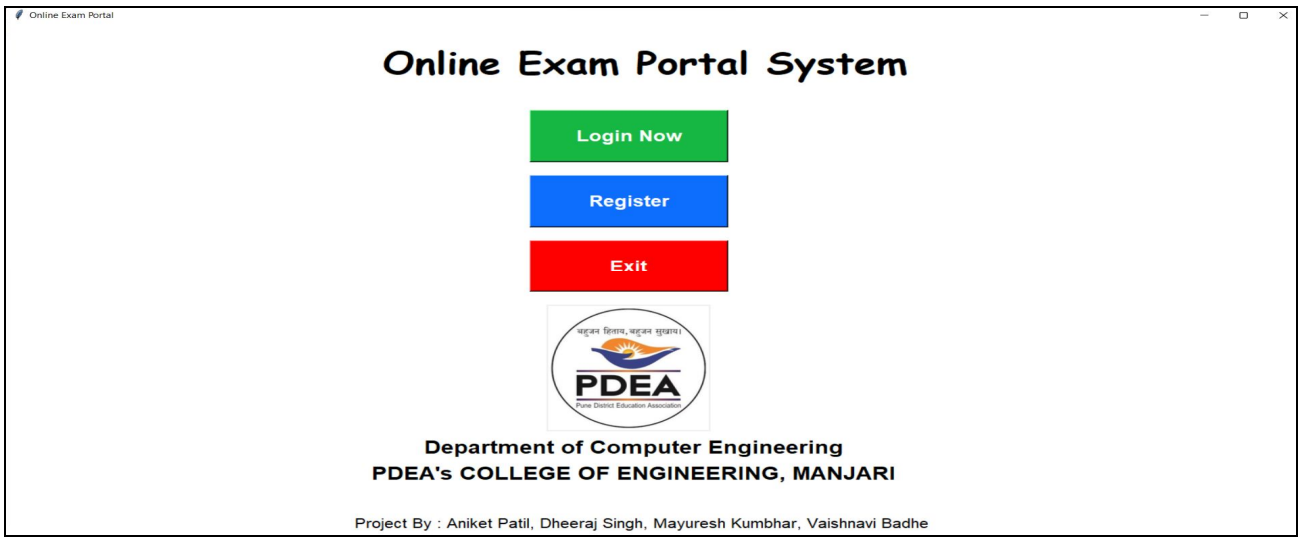


Fig.4 First Page

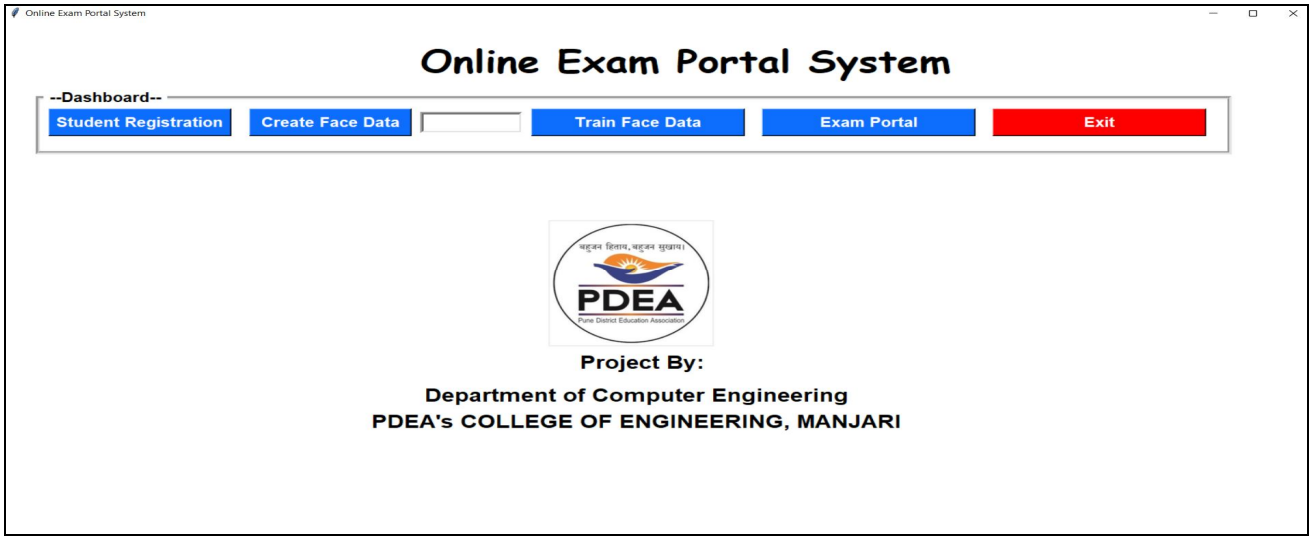


Fig.5 Home Page

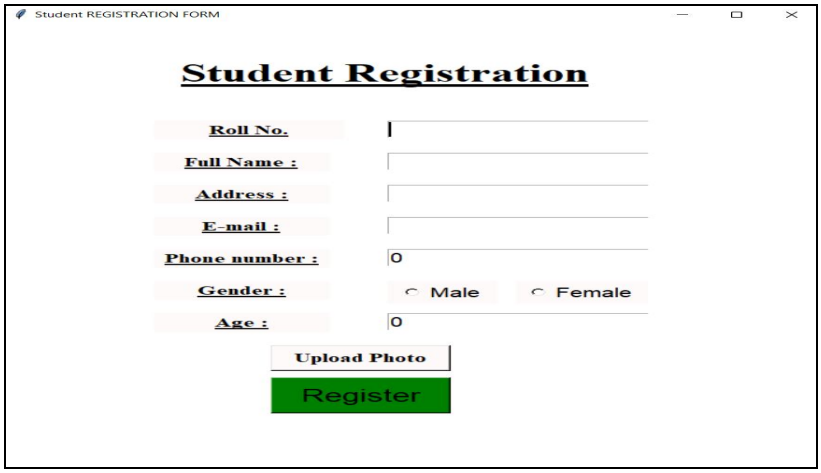


Fig.6 Registration Page

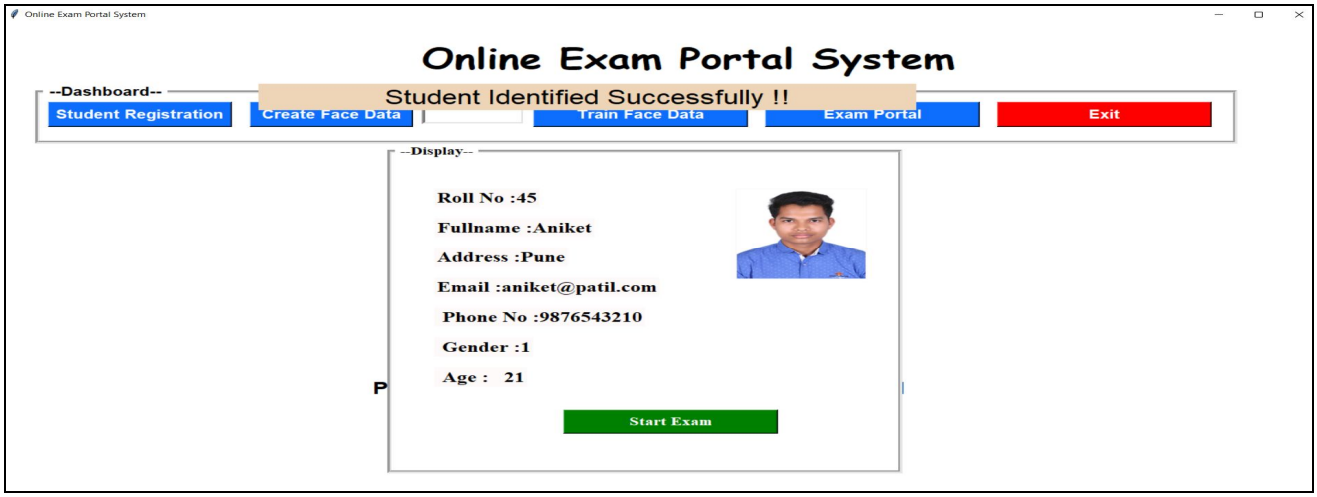


Fig. 7 Successfully Identified

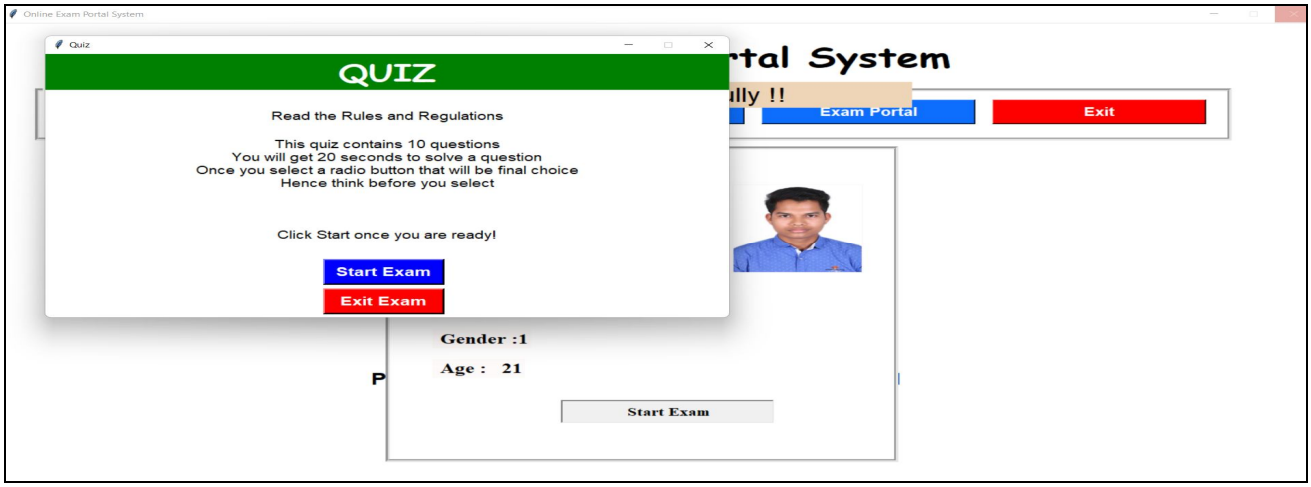


Fig. 8 Exam Start

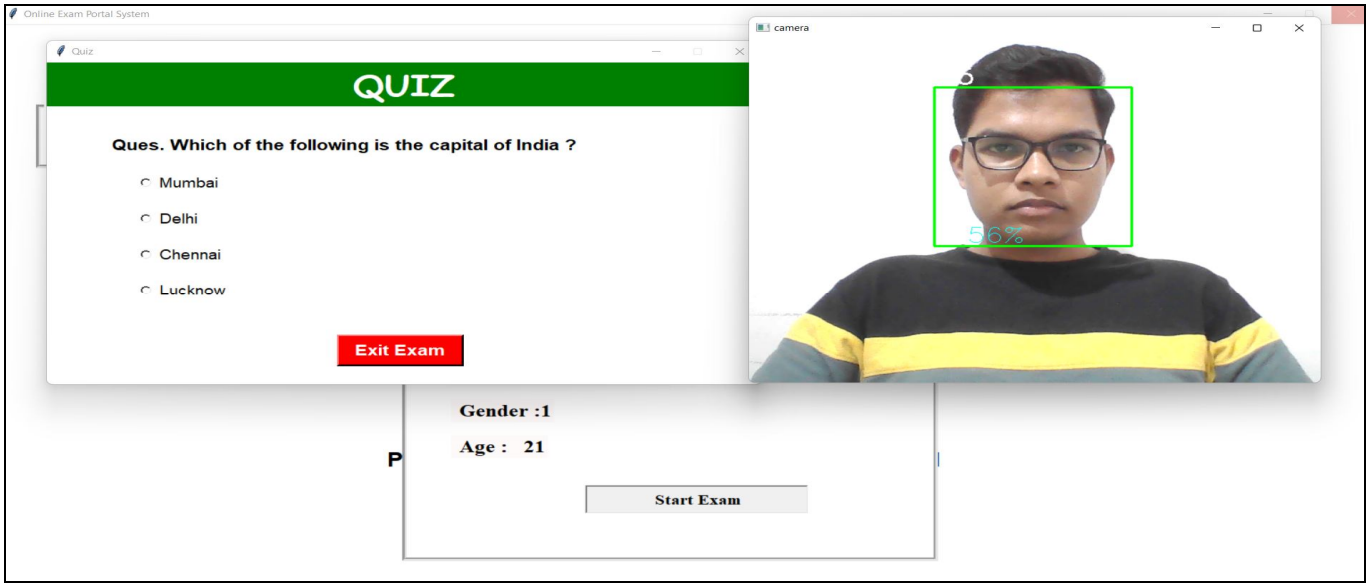


Fig.9 Face Detection

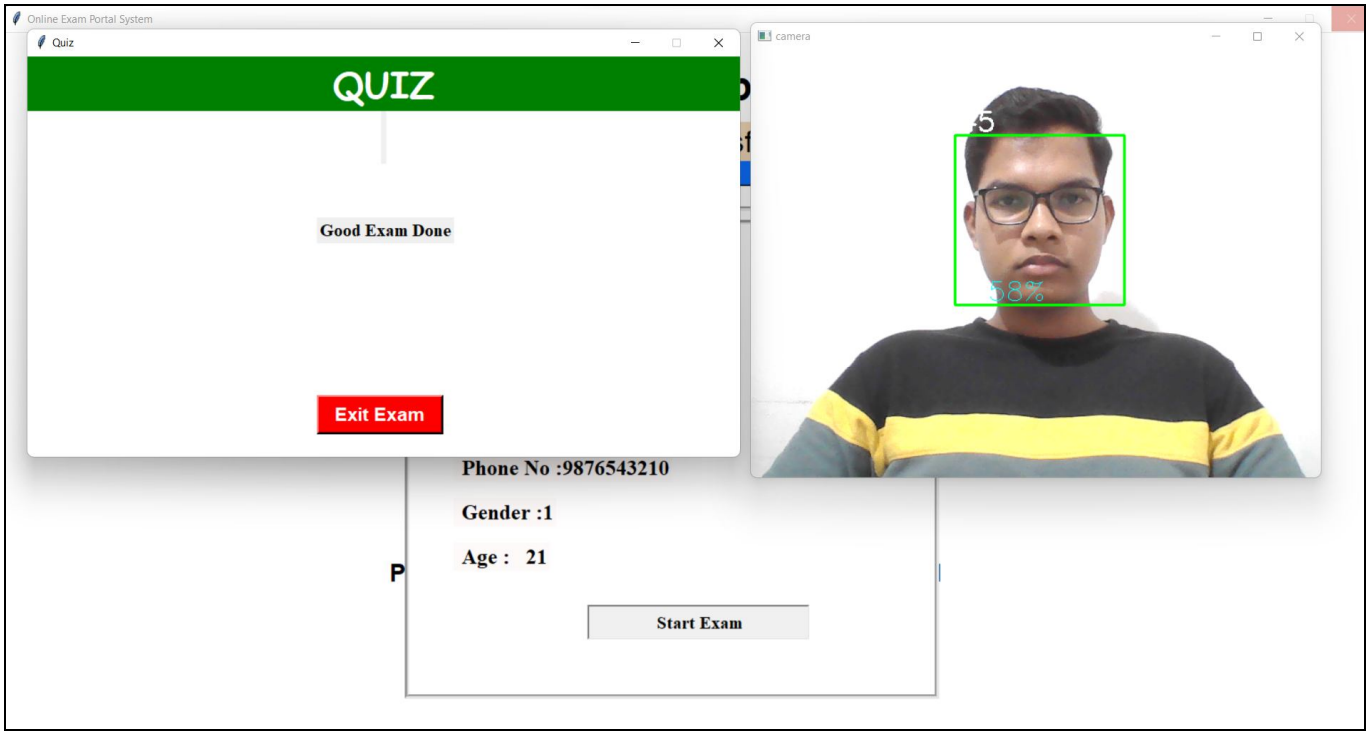


Fig.10 Exam Completed

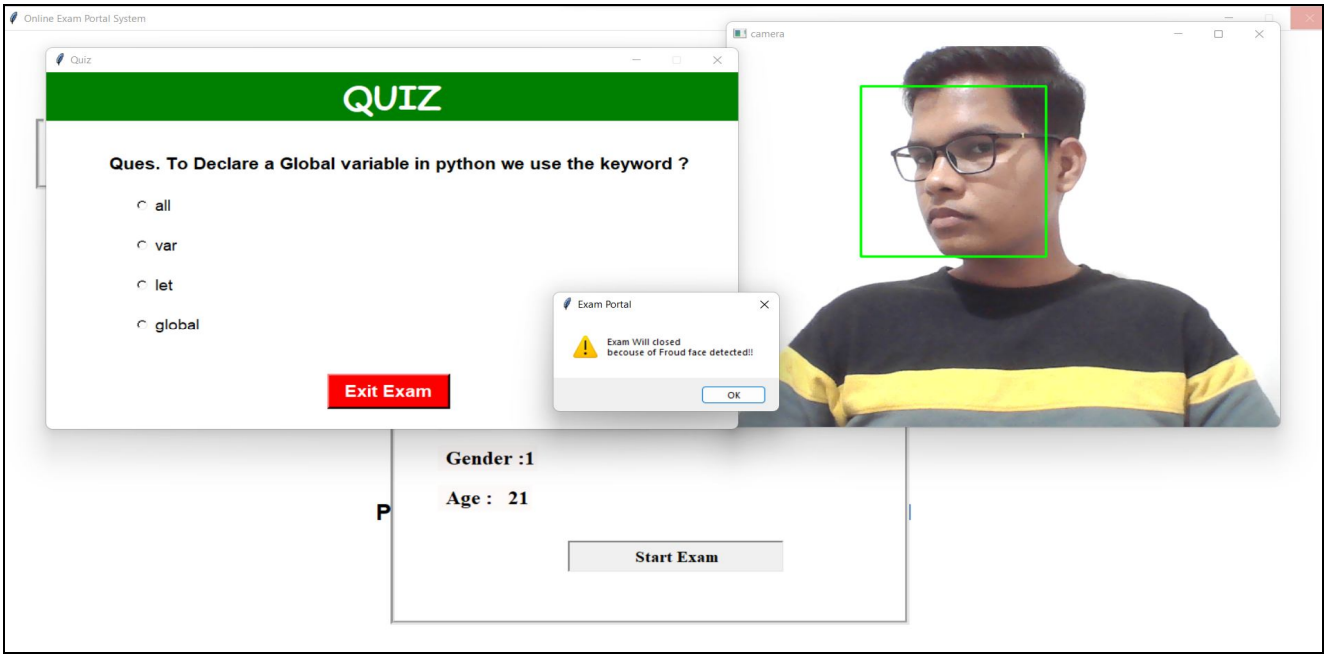


Fig.11 Fraud Detection

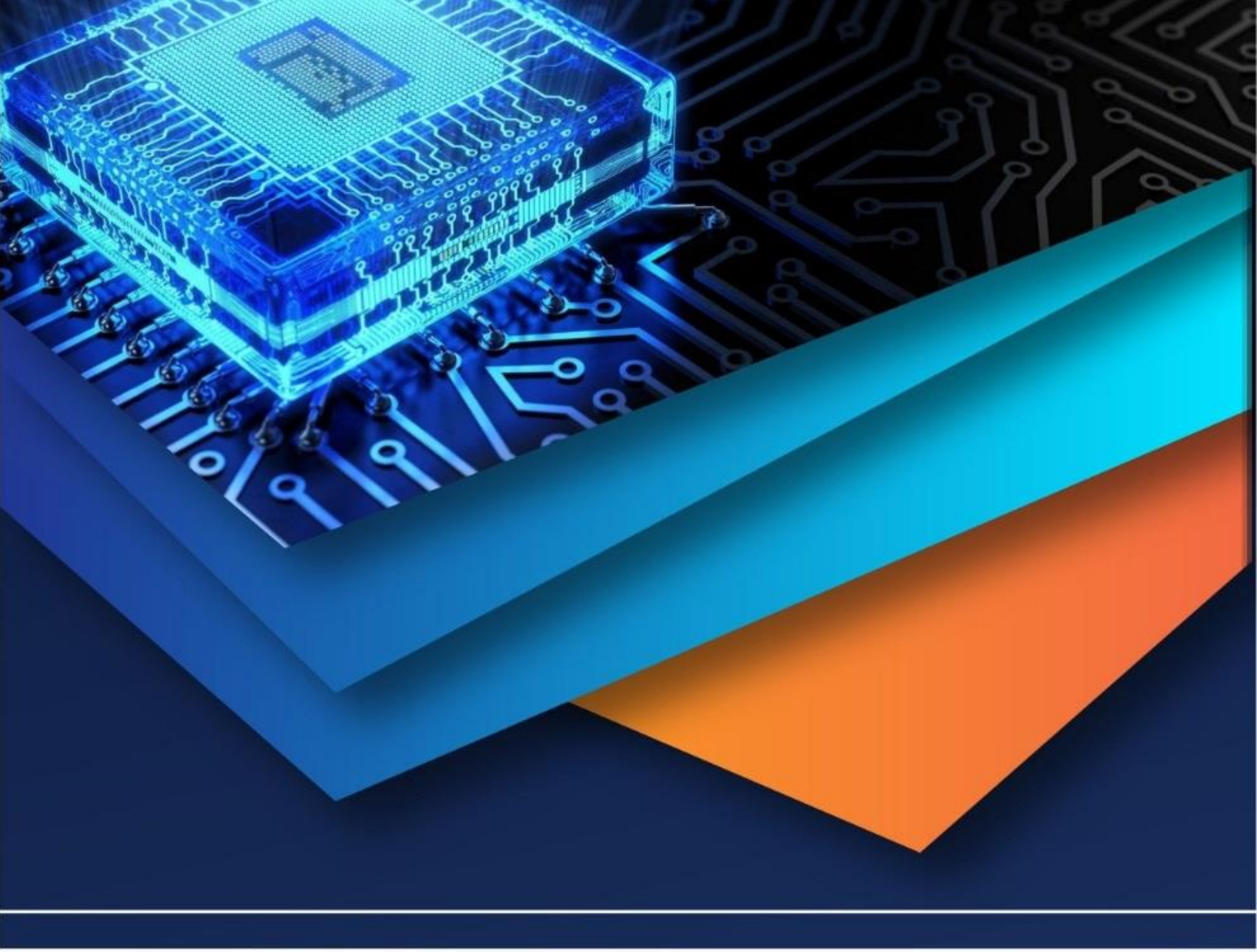
VIII. CONCLUSIONS

A machine learning based face detection and recognition system using Haar cascade model is proposed to detect the faces of students for monitoring their activities during online examinations. The proposed system aids in detecting the faces in a faster manner by obtaining feature vectors from the input images. Higher accuracy can be obtained. This application can be utilized in a variety of situations, including schools, colleges, and distant online interviews. The candidate may take the exam from any location, and the evaluator may inspect the candidate at any moment while or after the exam has been finished.

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