

MES COLLEGE OF ENGINEERING, KUTTIPPURAM
DEPARTMENT OF COMPUTER APPLICATIONS
20MCA245 – MINI PROJECT

PRO FORMA FOR THE APPROVAL OF THE THIRD SEMESTER MINI PROJECT

(Note: All entries of the pro forma for approval should be filled up with appropriate and complete information. Incomplete Pro forma of approval in any respect will be rejected.)

Mini Project Proposal No : ____1____
(Filled by the Department)

Academic Year : 2020-2022
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1. Title of the Project : Detection of Impersonation In Online Examinations Using Blockchain
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Date: 1/12/2021

Approval Status : Approved / Not Approved

Signature of
Committee Members }

Comments of The Mini Project Guide

Dated Signature

Initial Submission :

First Review :

Second Review :

Comments of The Project Coordinator

Dated Signature

Initial Submission:

First Review

Second Review

Final Comments :

Dated Signature of HOD

Introduction:

We are living in the era where office work is becoming work from home and examinations are becoming online examinations. In online examinations there is a lot of chance of impersonation. This paper proposes a method to overcome the downside of online examinations which is impersonation. This approach aims in increasing the credibility of online exams and eliminate the need for an invigilator so that the exams can be taken from any convenient location. In recent days, the candidate appearing for an online examination is authenticated by carrying out manual verification of the candidate's credentials by the invigilator. Conducting an automated face authentication dynamically during the exam at definite intervals will check the identity of the user. For this type of authentication, we use facial recognition system which uses the Viola-Jones algorithm, and SVM (SUPPORT VECTOR MACHINE) for detection and recognition respectively. Another problem faced in the examination system is the forgery of certificates. To solve this problem, we save the certificates generated from the online examination in the blocks of the blockchain. Blockchain is decentralized, transparent and tamper proof method of storing data which will help in the elimination of forging.

Objectives:

The system first requires registration of the candidate before the examination. On the beginning of the examination, the system takes your face and validates it and on verification, the candidate will be taken to the examination portal. The user's face will be captured dynamically at regular intervals to check the identity of the candidate. On completion of the examination, the score report or e-certificate is generated with a unique serial number as a pdf format which can also be downloaded. After generation of E-Certificate it will be stored in the blocks of a blockchain. Impersonation is a significant problem in online examinations. An efficient invigilation mechanism is the need of the hour to ensure the standard of examination and to maintain the authentic conduct of the examination. Hence, we propose dynamic face authentication using the Viola-Jones algorithm and SVM to check the integrity of the candidate in the beginning of the examination. After the examination, the student is evaluated automatically by the system and a valid score report is generated i.e. an E-certificate. The fabrication of data on the certificate has become a very easy task, which reduces the credibility of the examination. Thus, we also propose an anti-forge mechanism to cut the counterfeiting of certificates. Blockchain provides greater security, improved traceability, better security, and encrypted data features. By using blockchain, a forged or duplicated certificate can be detected. The candidate's credentials are stored in the blockchain by making use of hash values and are validated for duplication.

Problem Definition:

Existing system

At present the examination system is majorly manual. The candidate appearing for the online examination is authenticated by manual verification of their credentials by the invigilator. A staff manually evaluates the candidates answers and manually grades him/her. The data are manually added to the database in which errors may occur. The system does not perform any check on or before taking an examination. This lack of presence of an auto proctored examination has led to a rise of collusion(impersonation) and also

the score reports are stored only in the database. Data bases are prone to hacking by attacks like SQL injection. Lack of integrity and security of score reports contribute to want to check the previous health condition of a patient, it takes a lot of time and efforts.

Proposed system

We are aiming to conduct a fully automated examination system where the user can take the exam from anywhere and the authenticity of the candidate and his scores are verified. The assessment is auto proctored and so there is no need for an invigilator. The user's face is verified dynamically to check is identity throughout the examination. After the examination his answers are evaluated automatically by the system and a score card is generated. This score card is stored in the blockchain and it is also available for the candidate to download in pdf format. The hash value of the score card is added in the blockchain which makes it more tamper proof.

Basic functionalities:

Modules

1.Admin

- Student registration
- Adding subjects
- Exam scheduling
- Adding questions and answers
- Adding study materials

2.Student

- Login
- View study materials
- View exam notifications
- Attend exams
- View results

Identity Verification

The identity of the candidate is verified by the face authentication system. The identity verification is done every 5 minutes to check if no impersonation has happened. This face authentication system uses face recognition algorithm to locate or identify a face and SVM algorithm to classify the faces in the database.

A. Face recognition algorithm

A face recognition algorithm is an underlying component of any facial detection and recognition system or software. Specialists divide these algorithms into two central approaches. The geometric approach focuses on distinguishing features. The photo-metric statistical methods are used to extract values from an image. These values are then compared to templates to eliminate variances. The algorithms can also be divided into two more general categories — feature-based and holistic models. The former focuses on facial landmarks and analyzes their spatial parameters and correlation to other features, while holistic methods view the human face as a whole unit.

IMPLEMENTATION

The project is been executed to accomplish the results by three modules namely:

- Face authentication
- Online examination portal
- Certificate generation, and Certificate verification

A. Face Authentication

We use image processing toolbox to perform the face authentication. Just like any other form of biometric identification, face recognition requires samples to be collected, identified, extracted with necessary (features) information, and stored for recognition. The algorithm that is used for face recognition is Viola-Jones algorithm and SVM (Support Vector Machine).

B. Online Examination Portal

After face authentication, the candidate is provided with the examination on portal which is built using Python where they can write their exam and the score report will be generated as an e-certificate for each candidate.. WAMP/XAMPP allows you to build a local webserver.

C. Certificate Generation and Verification

E-Certificate will be generated for each candidate as a pdf format. It is also downloadable. The hash value of the pdf is calculated and stored in the blockchain. The verification portal again calculates the hash value of the file and check if it matches with the hash value of the pdf in the blockchain. As we use blockchain, only authorized people can access the documents stored using their private keys.

Tools / Platform, Hardware and Software Requirements:

Software Requirements

. The application requirement:

- OPERATING SYSTEM: WINDOWS 10

- FRONT END: HTML, CSS, JAVASCRIPT
- BACK END: Mysql
- SOFTWARES USED: JetBrains Pycharm, Android Studio
- TECHNOLOGY USED: PYTHON, JAVA
- FRAME WORK USED: Flask

Hardware Requirements

The selection of hardware is very important in the existence and proper working of any software. Then selection hardware, the size and capacity requirements are also important.

- Processor : 64 bit
- RAM: Min 3 GB
- Hard Disk: 10 GB