

MES COLLEGE OF ENGINEERING, KUTTIPPURAM  
DEPARTMENT OF COMPUTER APPLICATIONS  
20MCA246 – MAIN PROJECT

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**PRO FORMA FOR THE APPROVAL OF THE FOURTH SEMESTER MAIN PROJECT**

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*(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.)*

Main Project Proposal No : \_\_01\_\_  
\_\_\_\_\_

Academic Year : 2021- 22

Year of Admission : 2020

1. Title of the Project : Online Examination using Blockchain

2. Name of the Guide : Nowshad C V

3. Student Details (in BLOCK LETTERS)

Name

Register Number

Signature

ANJANA M S

MES20MCA-2009



Date: 16/03/2022

**Approval Status :** Approved / Not Approved

Signature of  
Committee Members }

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**Comments of the Guide**

Dated Signature

Initial Submission :

First Review :

Second Review :

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**Comments of the Project Coordinator**

Dated Signature

Initial Submission:

First Review

Second Review

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Final Comments :

Dated Signature of HOD

# ONLINE EXAMINATION USING BLOCKCHAIN

Anjana M S

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## **Introduction:**

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, I 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, I also propose an anti-forgery 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. This approach aims in increasing the credibility of online exams and eliminate the need for an examiner 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 examiner.

## **Objectives:**

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 examiner. 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. Lack of integrity and security of score reports contribute to collusion and duplication respectively. Also evaluating student performance manually is time consuming and difficult process. 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.

## **Problem Definition:**

I 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 examiner. The user's face is verified dynamically to check his 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. Here also have online exam monitoring.

## **Basic functionalities:**

### **Functional Modules**

- **Block chain**

All the student information is stored in blockchain. Blockchain is **a record-keeping technology designed to make it impossible to hack the system or forge the data stored on it, thereby making it secure and immutable**. It is a type of distributed ledger technology (DLT), a digital system for recording transactions and related data in multiple places at the same time.

- **SVM(Support Vector Machine)**

Svm is used for student face verification. Support vector machines (SVMs) are a set of supervised learning methods used for **classification, regression and outliers detection**. The advantages of support vector machines are: Effective in high dimensional spaces. Still effective in cases where number of dimensions is greater than the number of samples.

- **Decision Tree Algorithm**

Decision tree is used for student performance analysis. One of the most popular predictive modelling techniques is the decision tree, which is used for predicting and categorizing a given data object based on a previously generated model. A decision tree produces sequences of rules that help for decision-making. C4.5 is one of the most efficient decision tree used for classification purposes in predicting student's performance. The rules can be generated from the visualized decision trees for a better understanding of the most impactful attribute and also of the final outcome.

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

- Face authentication
- Online examination portal
- Certificate generation, and Certificate verification
- Student performance Analysis

#### **A. Face Authentication**

The system first requires registration of the candidate before the examination. On the beginning of the examination, the system takes candidate's face and validates it and on verification, the candidate will be taken to the examination portal. This face authentication system uses face recognition algorithm to locate or identify a face and SVM algorithm to classify the faces in the database.

#### **B. Online Examination Portal**

After face authentication, the candidate is provided with the examination portal which is built using Python where they can write their exam in objective type questions. The candidate's face is verified dynamically to check identity, throughout the examination. The candidate's face will be captured dynamically at regular intervals to check the identity of the candidate. On completion of the examination and the score report will be generated as an e-certificate for each candidate. 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. By us blockchain, only authorized people can access the documents stored using their private keys.

#### **D. Student's Performance Analysis**

Using Decision tree/SVM algorithm, the student's performance will be evaluated. The dataset will have features of students Such as score, attendance, First series mark, Second series Mark, Family background etc. Using these features student's range will be predicted like below average, average or outstanding. So that their teachers can understand who is falling back and can take actions to improve his/her grades. Also students and staff can interact with each other in the chat section.

### **Module Description**

#### **Admin**

- Add ad manage course
- Add and manage staff
- Add and manage subject
- Subject allocation
- View student
- Add and manage time table

#### **Staff**

- Add and manage student
- Add and manage exam notification
- Upload videos
- Upload study materials
- Manage exam
- View question paper
- Chat
- View attendance
- View time schedule
- View allocated subjects
- View answer

#### **Student**

- View video
- View study material
- View subject
- Face verification and attend exam
- View result & E-certificate
- Chat
- Online exam monitoring

## Tools / Platform, Hardware and Software Requirements:

### **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 : Intel Pentium Core i3 and above, 64 bits
- RAM : Min 3GB RAM
- HARD DISK: 10 GB

### **Software Requirements:**

One of the most difficult task is selecting software for the system, once the system requirements is found out then we have to determine whether a particular software package fits for those system requirements. The application requirement:

- OPERATING SYSTEM: WINDOWS 10 AND ABOVE
- FRONT END: HTML, CSS, JAVASCRIPT
- BACK END: Mysql
- IDE USED: JetBrains Pycharm, Android studio
- TECHNOLOGY USED: PYTHON JAVA
- FRAME WORK USED: Flask