Online Examination Using Blockchain

Abstract

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 respective. 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 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. After face authentication, the candidate is provided with the examination portal which is built using XAMPP 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. XAMPP allows you to build a local webserver. On completion of the examination, the score report will be generated for each candidate in 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 using blockchain, only authorized people can access the documents stored using their private keys. Then 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.

- **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 which is 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.