Self Evaluation System for Higher Education using HAAR Algorithm

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 ABSTRACT- The Learning Management Systems (LMS) have become very popular, especially because of the COVID-19 pandemic. They help make teaching and learning more effective and efficient. One important feature of LMS is online exams, which help teachers assess how well students understand the course material. These exams are crucial for students' progress. It's really important that the results of online exams are reliable and transparent. If there are any weaknesses, like hacking, it can affect students' grades badly. Usually, online exam systems store data in central databases like MySQL, which can be vulnerable to unauthorized access and changes. In this paper, we introduce a new way to make online exams more secure using blockchain technology. In our system, we store each question and answer of the exam directly on the blockchain. We've developed a module that works with Moodle, which is a popular learning management system. This module changes how exam results are stored, making sure they are secure and cannot be tampered with. We compared our blockchain based system with Moodle's standard way of storing exam results. Using blockchain makes sure that student data cannot be changed without authorization.

Index Terms-Blockchain, online test, online examination systems, smart contracts, Ethereum, meta mask wallet, learning management system, Moodle, centralized ledger database.

I.INTRODUCTION

COVID-19 has significantly altered the landscape of education worldwide, prompting many schools and universities to transition to online learning instead of traditional pen and paper methods. E-learning, which involves the transmission of knowledge via electronic applications, has emerged as a prominent alternative. This approach replaces traditional paper-based work with a range of the technological tools that offer numerous benefits for the students. E-learning enables students to access lectures in the form of videos or tutorials, which they can watch on their personal computers or   laptops at their convenience. This flexibility allows the students to engage with the course materials whenever they choose, facilitating better understanding   and retention of the
information. Moreover, it fosters classroom interaction by encouraging active participation in online tutorials and collaborative work assignments. There are several advantages associated with e-learning for students. Courses and lectures are available on-demand, allowing students to revisit course materials and complete assignments at their own pace. This flexibility accommodates different learning styles and schedules, enhancing the overall learning experience. Online exams offer significant advantages for both educators and students, making them a valuable tool in e-learning. Compared to traditional paper-based tests, e-exams save faculty members time and effort in grading and result announcement. Additionally, students benefit from the convenience and safety of e-exams, as they eliminate the need for manual correction and score extraction. Overall, online exams are considered one of the most important e-learning tools for assessing student success. Online exams are becoming more popular due to their user-friendly nature, but they often face security issues and breaches when stored on centralized servers. This can lead to cheating, data hacking, or even deletion of exam content. To address these challenges, blockchain technology can be used to ensure security and reliability, as data stored on the blockchain is resistant to manipulation.We will use Moodle, a widely used Learning Management System (LMS), which offers features like online lectures, assignments, and exam creation, so it can be done by along with an auto-grading system aim is to compare traditional centralized systems with modern decentralized ones and demonstrate a new model that transforms exams into a web based on web application. Our model allows students to log in, take exams, and submit answers directly onto the blockchain network. The exam administrator can access a dashboard and also displaying all submitted answers. The main advantage of our model is its utilization of blockchain technology, which ensures tamper-proof storage of exam data, addressing concerns such as cheating and hacking. Additionally, by integrating with Moodle, it provides a familiar environment for exam administration. The auto-grading system streamlines the grading process, offering timely feedback to students. In summary, this paper introduces a novel model that combines blockchain technology, the Moodle Learning Management System (LMS), and an auto-grading system to enhance the security, reliability, and efficiency of online exams. The main objective is to overcome the limitations of centralized exam systems by leveraging the immutability and transparency of blockchain technology. By doing so, the proposed model offers a secure and dependable solution for administerin online exams. This flexibility

allows students to engage with course materials whenever they choose, facilitating better understanding and retention of information. Moreover, it encouraging active participation in online tutorials and also tutorial work assignments.

LITERATURE SURVEY

Several researchers have proposed different approaches to enhance the security of online exam results. Jain et al. [13] introduced a model where students pay for exams using cryptocurrency, and their exam data are stored as smart contracts on the blockchain. However, this model had a vulnerability where student addresses were saved in a centralized database, making it prone to tampering. Yuan et al [14] developed a web-based online examination system where students take exams, and the system generates grades based on transmitted questions and results. Shinde [15] implemented a system with face detection to prevent cheating during exams. After completion, the system calculates marks and displays results. Rashad et al [16] proposed a web-based examination system that includes various question types and auto-marking features. Although it was Our contribution lies in the development of a module that can be integrated into Moodle, a comprehensive Learning Management System (LMS) widely used in online education. This module aims to ensure high reliability, accuracy, and tamper-proof results for online exams and quizzes conducted within the LMS. Yang et al [20] proposed a verification framework for centralized ledger databases (CLD), focusing on robust external tested and proved valid, it stores data centrally, posing reliability concerns. Fagbola et al [17] proposed a web application for online exams, addressing issues like auto-submission and result generation. However, it still stores data centrally, raising reliability issues. Rooksby and Dimitrov [18] suggested a system based on Ethereum and Smart Contracts to store student grades transparently. While it shows promise, a complete case study to assess system validity and accuracy is lacking. Pee et al [19] designed an online testing system based on blockchain and CP-ABE encryption, where specific teachers set questions using their private keys. This restricts access goes to authority, auditability and rapid verification. They introduced the concept of Dasein verification, combining elements of what, when, and who validation. Their framework demonstrates improved verification throughput and reduced latency compared to existing solutions. However, their approach relies on CLD, which may have limitations regarding timestamp authenticity. To address this, they propose a two-way timestamp pegging protocol to secure data against tampering auditability and rapid verification. They introduced the concept of Dasein verification, combining elements of what, when, and who validation. Their framework demonstrates improved verification throughput and reduced latency compared to existing solutions. However, their approach relies on CLD, which may have limitations regarding timestamp authenticity. To address this, they propose a two-way timestamp pegging protocol to secure data against tampering. In contrast, our approach leverages blockchain technology within a private blockchain network to verify students' identities using private keys and secure their exam data via smart contracts. This ensures the integrity and security of exam results. Online exams and quizzes are crucial components of any LMS, but it's essential to ensure the reliability and tamper-proof nature of the results. Centralized databases, commonly used in LMS, pose security risks as they are susceptible to unauthorized access and alteration. We present a generic module .

.PROBLEM STATEMENT

Mostly the college students face the issue of the re-valuation where sometimes the correction might be a problematic due to manual correction. Some student make a writing with any content which will be a time wasting process for the staff. Staff also feels a tedious work for the paper correction method.
Manual based correction is done. The correction will be a tedious work for the staffs and the university. The maintenance of the work for the paper will be a pressurized work. The admin management and maintenance is too difficult.

ALGORITHM

The Haar cascade algorithm is a machine learning-based object detection technique used to identify objects or patterns within images. It was introduced by Viola and Jones in their seminal paper "Rapid Object Detection using a Boosted Cascade of Simple Features" in 2001. The algorithm is widely used for face detection but can be adapted for detecting other objects as well. Integral Image Calculation: The algorithm begins by calculating integral images from the input image. Integral images allow for rapid computation of sums of pixel values within rectangular regions of the image. This integral image calculation significantly speeds up subsequent feature evaluations. In college and university systems, there is a growing need for an efficient and reliable method of assessing students' skills and knowledge in artificial intelligence (AI) courses. Traditional methods of assessment, such as exams and assignments, may not adequately capture the depth and breadth of students' understanding of AI concepts. Additionally, assessing AI skills often requires evaluating practical problem-solving abilities, which may be challenging to measure accurately through conventional means.

Haar-like Features: The algorithm defines a set of Haar-like features. These features are rectangular patterns of pixel intensities that are used to capture certain characteristics of the object being detected. Haar-like features include edge features, line features, and center-surround features.

Feature Selection: The algorithm selects a subset of the Haar-like features that are most discriminative for the object being detected. These features are chosen using a machine learning technique called Adaboost, which assigns weights to each feature based on its ability to correctly classify positive and negative examples.

Cascade Classifier: The selected features are organized into a cascade classifier, which is a series of stages, each consisting of several weak classifiers. Each weak classifier evaluates a single Haar-like feature and determines whether the feature is present in the image region being examined.

Adaptive Boosting (Adaboost): The Adaboost algorithm is used to train the cascade classifier. Adaboost combines multiple weak classifiers into a strong classifier by assigning weights to each weak classifier based on its classification accuracy. Weak classifiers that perform well are given higher weights, while those that perform poorly are given lower weights.
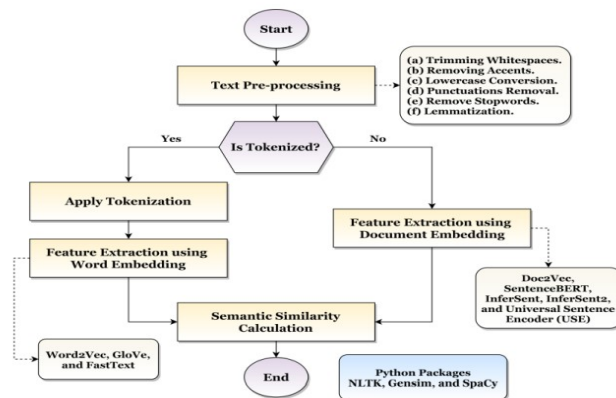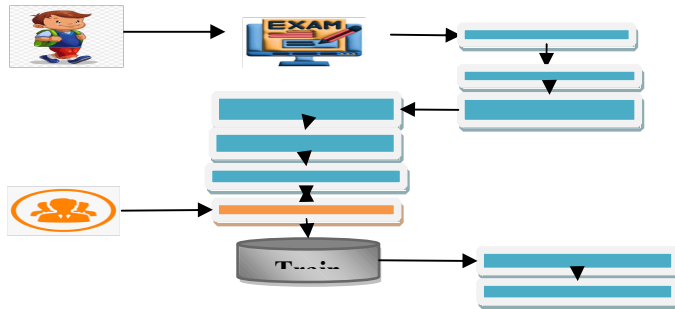
B. Working

A pre trained face process for the student can be done using haar cascades. The haar cascade contains the details of the concern face features which will be stored as training information and when the student make a login it will verify the concerns student in testing phase. Ann classification can be used with where the concern student login has been generated. The staff will have a separate login with the question upload and keywords training for the question will be done. The maintenance of the question will be given with theoretical analytics with patterned keyword. The NLP matching is the process where the Natural Language Processing makes out a correct correction over the web based on the online examination system. In examination a timely alert system will be done with the question alert where afterba timely limit the question will be changed automatically. After the examination,an automatic correction will be done with the NLP and Recurrent Neural Matching Algorithm. The system will make a NLP based word removal with RNN keyword matching technique for the theory exam correction. RNN's are mainly used for Sequence Classification. In the mark allotment module, the extraction of the Natural Language Process based processing system is done. With these extractions the correction of the keyword matching extraction and correction with mark allotment is done and then the result is shown.

VI. CONCLUSION

The project report titled Automatic Answer Checker is now in its final stages. The application was created with every possible error in mind, so the system is quite efficient and reliable. Because the application has the unique property of being robust in nature, there are numerous ways to implement improvements in the application in the near future. The application would be approved and authenticated shortly before being implemented. The purpose of this paper was to present a novel technique for evaluating the question paper using computer platform.

VII. FUTURE ENHANCEMENT

Future work would consist of developing an assessment algorithm whose purpose would be to detect all syntax errors in our keywords, and then investigating it for high performance and equality in addressing them. Diagrams cannot be corrected on further correction system and mark assesments. Seamless integration of AI-powered self-assessment tools with existing LMS platforms can enhance accessibility and usability for both students and educators. This integration can streamline data management and ensure that self-assessment results are readily available with in the educational ecosystem.

REFERENCES

[1]   Al Rawashdeh. A. Z, Mohammed. E. Y, Al Arab. A. R, Alara. M, Al Rawashdeh. B and Al-Rawashdeh. B (2021), "Advantages and disadvantages of using e-learning in university education: Analyzing student's prespectives," Electron. J. e-learning, vol. 19, no.3,pp.107-117, May, doi: 10.34190/ejel.19.3.2168.

[2]   Antonopouls. A and Wood. G, (2018). Mastering Ethereum: Building Smart Contracts and DApps. Sebastopol,CA,USA:O'Reily Media.

[3]   Eltahir. M. E, Alsalhi. N. R and Al-Qatawnesh. S. S(2022), "Implementation of E-exams during the COVID_19 pandamic: A wuantitative study in higher education," PLos ONE, vol. 17,no.5, May, Art no. e0266940.

[4]   fagbola. T. M, Adigun. A. A and Oke. A. O (2013), "Computer-based test (CBT) system for university academic enterprise examination," Int. J. Sci. Technol. Res., vol.2, no. 8, pp. 1-7.

[5]   Gautam. S. S and Tiwari. M. K (2016), "Components and benefites of e-learning system," Int. Res. J. Comput. Sci., vol. 3, no. 1, pp. 14-17, Jan.

[6]   Jabbar. A and Dani. S (2020), "Investigating the link between transaction and computational costs in a blockchain environment," Int. J. Prod. Res., vol.58, no.11, pp. 3423-3436, June.   C.Nagarajan and M.Madheswaran - 'Experimental verification and stability state space analysis of CLL-T Series Parallel Resonant Converter' - Journal of ELECTRICAL ENGINEERING, Vol.63 (6), pp.365-372, Dec.2012.

[7]   C.Nagarajan and M.Madheswaran - 'Performance Analysis of LCL-T Resonant Converter with Fuzzy/PID Using State Space Analysis'- Springer, Electrical Engineering, Vol.93 (3), pp.167-178, September 2011.

[8]   C.Nagarajan and M.Madheswaran - 'Stability Analysis of Series Parallel Resonant Converter with Fuzzy Logic Controller Using State Space Techniques'- Taylor & Francis, Electric Power Components and Systems, Vol.39 (8), pp.780-793, May 2011.

[9]   C.Nagarajan and M.Madheswaran - 'Experimental Study and steady state stability analysis of CLL-T Series Parallel Resonant Converter with Fuzzy controller using State Space Analysis'- Iranian Journal of Electrical & Electronic Engineering, Vol.8 (3), pp.259-267, September 2012.

[10]   Nagarajan C., Neelakrishnan G., Akila P., Fathima U., Sneha S. "Performance Analysis and Implementation of 89C51 Controller Based Solar Tracking System with Boost Converter" Journal of VLSI Design Tools & Technology. 2022; 12(2): 34–41p.

[11]   C. Nagarajan, G.Neelakrishnan, R. Janani, S.Maithili, G. Ramya "Investigation on Fault Analysis for Power Transformers Using Adaptive Differential Relay" Asian Journal of Electrical Science, Vol.11 No.1, pp: 1-8, 2022.

[12]   G.Neelakrishnan, K.Anandhakumar, A.Prathap, S.Prakash "Performance Estimation of cascaded h-bridge MLI for HEV using SVPWM" Suraj Punj Journal for Multidisciplinary Research, 2021, Volume 11, Issue 4, pp:750-756

[13]   G.Neelakrishnan, S.N.Pruthika, P.T.Shalini, S.Soniya, "Perfromance Investigation of T-Source Inverter fed with Solar Cell" Suraj Punj Journal for Multidisciplinary Research, 2021, Volume 11, Issue 4, pp:744-749

[14]   C.Nagarajan and M.Madheswaran, "Analysis and Simulation of LCL Series Resonant Full Bridge Converter Using PWM Technique with Load Independent Operation" has been presented in ICTES'08, a IEEE / IET International Conference organized by M.G.R.University, Chennai.Vol.no.1, pp.190-195, Dec.2007

[15]   M Suganthi, N Ramesh, "Treatment of water using natural zeolite as membrane filter", Journal of Environmental Protection and Ecology, Volume 23, Issue 2, pp: 520-530,2022

[16]   M Suganthi, N Ramesh, CT Sivakumar, K Vidhya, "Physiochemical Analysis of Ground Water used for Domestic needs in the Area of Perundurai in Erode District", International Research Journal of Multidisciplinary Technovation, pp: 630-635, 2019   Jain. A, Kumar Tripathi. A, Chandra. N and Chinnasamy. P (2021), "Smart contract enabled online examination system based in blockchain network," in Proc. Int. Conf. Comput. Commun. Informat. (ICCCI), Jan., pp. 1-7.

[17]   Pee. S. J, Kang. E. S, Song. J. G and Jang. J. W (2019), "Online test and management system using blockchain network," in Proc. 21ˢᵗ Int. Conf. Adv. Commun. Technol. (ICACT), Feb., pp. 269-272.

[18]   Rooksby. J and Dimitrov. K (2019), "Trustless education? A blockchain system for university gradesl," Ubiquity, J. Pervasive Media, vol. 6, no. 1, pp. 83-88, Nov.,doi: 10.1386/ubiq_00010_1.

[19]   Rosic. A (2017). Smart Contracts: The Blockchain Technology That will Replace Lawyers. Blockgeeks, Italy.

[20]   Shinde. P. H. B (2022), "Exam conduction and proctoring system using face detection," Int. J. Sci. Res. Eng. Manag., vol. 6, no. 1, Jan., Art no. 11444.