

## **A Survey on Smart Education and Exam Hall Assistance using Voila Jones Algorithm and IoT**

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### **ABSTRACT**

*An increasingly common and trustworthy method of identification that can help the development of tremendously powerful computing is biometric technology. Universities and other institutions are still now employing antiquated methods to verify pupils before exams. Students who neglect to bring their exam slip to the exam room as proof of attendance will not be permitted to take the exam. In addition, many students fail to record their matriculation number and exam information. On the other hand, manually recording student attendance is a challenging undertaking that can take a lot of time. So, in this paper we are presenting the brief literature review on Smart Education and Exam Hall Assistance using Voila Jones Algorithm and IoT. The architecture described in this study uses a fingerprint sensor, an Atmega328 microprocessor, RFID (Radio Frequency Identification) and an LM35 temperature sensor to register and authenticate students while also tracking their body temperatures. The authorities can take the necessary action if the temperature is higher than the average body temperature. In conclusion, this system can replace traditional identification and authentication of a student for examination attendance and can reduce human errors.*

**Keywords:** *Biometric technique, authentication, machine learning, attendance, fingerprint sensor, microprocessor, RFID and temperature sensor*

### **INTRODUCTION**

In examination systems, authentication is significant. Identity-based authentication is the most common authentication method used in such systems. However, in many advanced examination systems, identity-based authentication is insufficient to confirm the student's identity. The use of biometric processing based on fingerprint or iris data is one of the authentication solutions. Technology known as biometrics may be used to identify people specifically based on their physiological or behavioral traits. Only two elements of a human are truly unique: the fingerprint and

the iris. It is simpler and easier to execute fingerprint recognition than iris recognition. Furthermore, it distinguishes clearly between a legitimate person and a forger. The main goal of our project is to identify each student who is qualified to take the test in a unique way. This article introduces RFID technology, often known as radio frequency identification. RFID is a type of contactless automated identification technology that uses radio frequency to identify the object and provides instant access to the necessary data. Large data storage capacity, read/write capability, strong penetrating

power, extended read/write distances, quick reading speed, long service life, and high environmental adaptability are some of its advantages. RFID technology can quickly and accurately identify moving objects as well as many tags. When paired with Internet and communication technologies, RFID technology's quick and easy operation makes it possible to track objects and share information globally.

The components of a smart classroom come together to create a collaborative and interesting learning environment. A smart classroom could include a number of technological elements that function effectively together. Making a classroom smart also involves pedagogical innovations in content delivery, student engagement, and assessment. The goals of a smart classroom's design are to close the communication gap between students and teachers, it assists teachers in giving lessons more successfully and enhance the atmosphere for teaching and learning as a whole. It features a smart board and projectors for showing multimedia information, tools for students to communicate with lecturers and other students, cameras for recording and saving lectures, and a sensor-enabled smart environment.

If we are to achieve the objective of smart education, we must also create new or enhanced teaching and learning methodologies. Frameworks for smart education must be used for implementation. In this endeavor, we developed a sophisticated, tiered instructional system. According to one definition of "smart education," it is a system of instruction that enables pupils to learn using a range of materials according to their talents and intellectual levels and that allows them to learn utilizing modern technologies Smart learning environments are sometimes referred to as "representing

a new wave of educational systems." The learner should be self-reliant, cooperative, and technologically knowledgeable in a smart learning environment. In traditional education, direct instruction is the most popular type of instruction. But with modern methods, the role of the educator as a facilitator is becoming increasingly crucial. Remember that teachers need to be adept digital users just like students.

Designing and Implementing an Adaptive Online Examination System details the conception and implementation of such a system. An adaptive exam system considers a student's aptitude and understanding in a given subject area. The students will receive questions that are generated automatically based on specific competencies. A method for adaptive assessments prevents the student's motivation and confidence from dwindling. Online tests are increasingly necessary since Learning Management Systems (LMS) like Moodle are being used more frequently. The number of concurrent tests increases with the use of student computers, however there is a chance for cheating. This document provides a description of the "Secure Exam Environment" (SEE) that the AAUK employs for tests administered via Moodle and completed by students' PCs.

### **RELATED WORK**

The work that has already been done on the Smart Classroom, Smart Education, and Examination System is discussed in this section.

### **Smart Classroom**

A classroom is a contained space where learning and teaching occur. It is the most important part of a school since it makes it possible for a teacher to impart knowledge to a group of students. Knowledge sharing is facilitated by the employment of modern hardware, software, web, and signal

processing technologies in a smart classroom. The components of a smart classroom come together to provide an interactive and interesting learning environment that enhances teaching techniques, fosters student ability development, elevates academic standards, and enables more active student participation. A smart classroom may benefit from various technological elements, working together in harmony, such as interactive whiteboards, audio/video components, management systems, and mobile computers. Alongside these, pedagogical advances pertaining to the delivery of material, student involvement, and assessment also aid in making a classroom smart [1].

The guiding principles of a smart classroom are intended to improve the environment for teaching and learning overall, bridge the communication gap between students and teachers, and assist teachers in delivering their teachings more effectively. A smart classroom has all of its necessary components, including the multidimensional learning environment, integrated levels, technology, innovation, and change management. It has a smart board and projectors for displaying multimedia content, communication tools for students with teachers and other students, digital assessment tools, cameras for recording and storing lectures, and a sensor-enabled smart environment that monitors the environment's temperature, humidity, air quality, and noise levels [1].

Multidisciplinary research is being done on smart classrooms. There has been a lot of research done on electronic technologies, including display devices, communication media, sensor networks, image recognition, the influence of technology, and acceptability. As a result, studies in these particular sectors have received a lot of attention in a number of

review papers, producing a range of results. However, because the aforementioned study topics are so diverse, it can be challenging to develop a thorough knowledge of smart classroom research as a whole and how to effectively connect different research efforts [1].

### **Smart Education**

To fulfil this requirement and fix the flaws in the present education systems and techniques, the idea of smart education should be utilized. In addition to a set of educational information and communication technologies, we need to develop new or improved teaching and learning approaches that have been thoughtfully created if we are to realize the goal for smart education. Implementing smart education requires smart education frameworks. We created such a clever educational structure in this job. This framework has multiple layers. The fundamental layer consists of new or better instructional strategies.

We define smart education as the "effective and coordinated use of information and communication technology to accomplish a learning outcome using an appropriate pedagogical approach.". Smart education focuses on offering individualized instruction at any time and place. Additionally, they claim that smart education involves studying outside of the confines of traditional classrooms and is a flexible activity. Smart education is defined as "an educational system that allows kids to learn by utilizing cutting-edge technology and it enables students to study with varied resources based on their intellectual and aptitude levels." The objective of intelligent learning environments, often known as intelligent education, is to enhance learning processes. Involving an effective and efficient interplay of pedagogy, technology, and their

integration, they "represent a new wave of educational systems."

The learner in a smart learning environment should be independent, cooperative, and proficient with technology. Both conventional and modern education place a premium on instructional design. Direct instruction is the most common teaching strategy used today. However, the educator's position as a facilitator is becoming more important in contemporary techniques. Technology support is one significant function that educators play in smart education. If necessary, the educators/teachers should also be able to help students with technical issues. Keep in mind that educators should be proficient technology users just like students. Connectivity is a key differentiating feature of the educational technology enabling instruction in a smart educational environment [17].

### **Smart Examination System**

A design and implementation of an adaptive online exam system is done in this paper [15]. With an adaptive test system, a student's aptitude and expertise in a particular field of knowledge are key factors. Additionally, questions will be prepared for the students automatically based on those competencies. An adaptive exam technique prevents the student's motivation and confidence from eroding because the questions are more difficult than their ability to handle. Additionally, a student's self-confidence and morale may suffer as a result of answering questions that need more knowledge than they now possess.

Since questions are specific, they can be used to evaluate students in a useful way. One advantage of the system is that measurement takes less time overall and hence, it allows greater exam management flexibility. The system has some anti-

impersonation safeguards. Face detection and other effective techniques for authentication are available [5-7].

Researchers are paying close attention to new algorithms for safe authentication in mobile devices [8], [9], and [10]. The primary concern is generally the computational load produced by face detection methods. A lot of research has been done on how well face recognizers operate in real-time on mobile devices [11], [12], and [13]. Spoofing attacks in face detection breach security, but the academic community is working on it [14],[15]. Secure Online Examinations With the growing popularity of Learning Management Systems (LMS) like Moodle [16], it is essential to administer tests online. Although it is possible, providing 100 computers and related hardware in the exam room would be quite expensive. The number of concurrent exams is increased by using student computers, however there is a chance that someone will cheat. The "Secure Exam Environment" (SEE) used at the AAUK for tests based on Moodle to be taken on student laptops with security for accessing local files or the Internet is described in this paper. Applications from third parties, such as Excel or Java, can be installed and utilized during the tests.

### **RESEARCH GAP**

Verification of personal identity: There are many cases of false candidate appearing for exam. This is possible because of poor authentication process. Candidates easily duplicate the ID or hall ticket. So, in order to conduct online exam proper authentication process is very much required to avoid false candidates from attending the exam.

In IJCEA the security issue followed is QR Code verification, when a student registers for the exam a QR code is generated. This QR code contains all the information of

the student. After registration this QR code is mailed to the student. Student will come with this QR code to exam center. QR code will be scanned by examiner using scanner and the information in QR code is decrypted using secret key. Using this information examiner verifies if the student is authenticated or not. And after verification he/she is allowed to sit for exam. This will prevent false candidates from attending the exam.

### CONCLUSION

This era is the era of youth where everyone wants exam systems to be fast, accurate and service oriented. In this paper we have discussed about exam system and secure exam environment. But the existing exam systems are not very secure. In previous papers QR code was used for authentication purpose which is not very secure. The authentication process is slow and does not provide appropriate security. So, our motto is to provide system that can work as a single complete secure exam system. Our proposed system uses biometric technology for authentication. Our system prevents students from exchanging their IDs during exams. Also, the use of RFID for authentication makes the proposed system more precise and accurate.

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