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Hand Gesture Based Virtual Quiz Game

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Abstract: *We proposed a virtual quiz system based on artificial intelligence that detects hand gestures and extracts functions using a web camera. For students we have given Register/Login here. Everyone on must register to take the test. In this case, we used the manual tracking module to answer the quiz questions. This method uses a web camera connected to the system to record a live image. Manual segmentation and real-time video processing are performed first. After segmentation, hand signs are tracked to detect hand movements. The minimum distance between two defined landmarks is determined by comparing the system-defined \gesture and the real-time video gesture. This results in the response being saved and compared with the template response. Scores are presented at the end of the quiz as a percentage of correct, incorrect and missed questions. For people with disabilities, this system is efficient and useful. Using this state-of-the-art gesture recognition technology, the system reduces the time of manual examination systems.*

Keywords: Artificial Intelligence, Hand Gesture, Gesture Recognition, Human Computer Interface, CNN Algorithm, MediaPipe, OpenCV, CSV File

I. INTRODUCTION

Advances in technology have revolutionized the way we interact with computers. In the past, the main input devices for human-computer interaction (HCI) were the keyboard and mouse.However as hardware and software evolve, new HCI methods have emerged. Among these methods, speech recognition and gesture recognition are gaining more and more attention. Gesture recognition technology allows users to interact with computers using \hand gestures, making communication more intuitive and natural. Gesture recognition is becoming an integral part of HCI and has several applications such as gaming, virtual reality and healthcare.

Hand Gesture Recognition

Hand motion acknowledgment is the handle of translating hand developments to perform a particular assignment. It includes utilizing a camera to capture pictures of hand motions, and at that point utilizing machine learning calculations to translate these pictures. The algorithms are prepared to recognize particular hand signals and relate them with particular activities. Gesture-based HCI is getting to be progressively prevalent, particularly in the gaming industry. Hand signal acknowledgment technology permits gamers to control the diversion utilizing their hand developments, giving a more immersive encounter. For occurrence, in a test amusement, hand motions can be utilized to select answers, making the interaction more locks in and fun.

Applications of Hand Gesture Recognition

1. Gaming: Hand motion acknowledgment can be utilized to control video diversions. Gamers can utilize hand motions to perform different activities, such as selecting choices and controlling characters.
2. Virtual Reality: In virtual reality, hand motion acknowledgment can be utilized to connected with the virtual environment. Users can utilize hand signals to perform errands such as getting objects and opening entryways.
3. Healthcare: Hand signal acknowledgment can be utilized in healthcare to give an elective input strategy for patients who have versatility issues. For occasion, patients with cerebral paralysis can utilize hand signals to control their wheelchair or communicate with doctors.

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4. Sign Dialect Acknowledgment: Hand motion acknowledgment can be utilized to recognize sign dialect. This technology can be utilized to create applications that can decipher sign dialect and decipher it into talked language.

Challenges in Hand Gesture Recognition

In spite of the various applications of hand motion acknowledgment, there are different challenges that analysts confront in developing dependable hand signal acknowledgment frameworks. These challenges incorporate:

1. Lighting: Lighting conditions can influence the execution of hand motion acknowledgment frameworks. Destitute lighting can result in low-quality pictures, making it troublesome for the framework to recognize hand signals precisely.
2. Impediment: Impediment happens when an question discourages the see of the hand motion. This can make it challenging for the framework to recognize the hand motion precisely.
3. Signal Inconstancy: Hand signals can change depending on the person performing them, making it troublesome for the framework to recognize them precisely.
4. Real-Time Handling: Real-time preparing is basic in hand motion acknowledgment frameworks, particularly in applications that require quick input, such as gaming. Accomplishing real-time handling can be challenging, as it requires handling expansive sums of information rapidly.

II. PROBLEM STATEMENT

The goal of this project is to create a virtual quiz system powered by artificial intelligence that can improve traditional quiz performance by reducing time consuming keyboard and mouse. Students can answer quiz questions using hand gestures thanks to the system's hand gesture recognition technology. The virtual quiz system is created using artificial intelligence methods such as machine learning algorithms that allow hand gestures to be recognized and understood quickly and efficiently. Overall, the method provides a fun and engaging experience for students, improving both quiz productivity and efficiency.

III. RELATED WORK

The online quiz system is an electronic testing framework to start your studies. It is anything but a framework for students to pass the exam that does not require pen and paper. The main goal of this system is to make online surveys user-friendly and minimize manual work for students and teachers. This method allows teachers to closely monitor their students' growth while taking online tests. Thanks to this, teachers benefit from time savings and better monitoring of students' performance.

Both teachers and students find the system easy to use and logical. The test is available to students anytime and anywhere they have an internet connection. They can answer questions using hand gestures, which the system can recognize and decode using artificial intelligence-based hand gesture recognition technology.

The system allows teachers to create quizzes and distribute them to students. In addition, they can track student progress in real time and pinpoint areas that need development. In addition, the system provides automatic evaluation and feedback, which saves teachers' time and provides timely feedback to students about their performance.

Overall, this approach provides teachers and students with a quick and efficient way to administer exams and track student progress. This reduces the manual work required by traditional quiz systems and saves time, making it a preferred choice for educational institutions.

IV. METHODOLOGY

In this section, we have covered the subtleties of the programming advancement methodology. The task method is crucial because it facilitates the logical organization of examinations to solve issues and create, arrange, and oversee the development of a data system.

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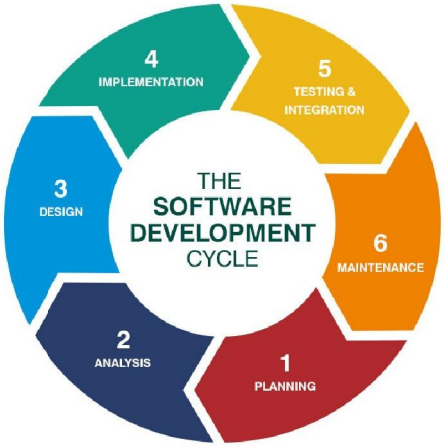

Fig: SDLC Lifecycle

Once the framework is complete, testing is necessary to ensure that it meets the project's goals. We will also go into further detail on the usage case graph of the Quiz framework. There are several models used in the Software Development Life Cycle (SDLC). which consist of the V-Shaped, Iterative, Spiral, Agile, and Evolutionary Prototyping models. Among the categories is an Iterative Model. The administrator can add, edit, and remove quiz questions based on the most recent editions of the pertinent textbooks, and students can log in to the system to take part. User may read questions to attempt, and when they are done, marks will be computed in accordance with automatic result marking, and result sheets will be created result.

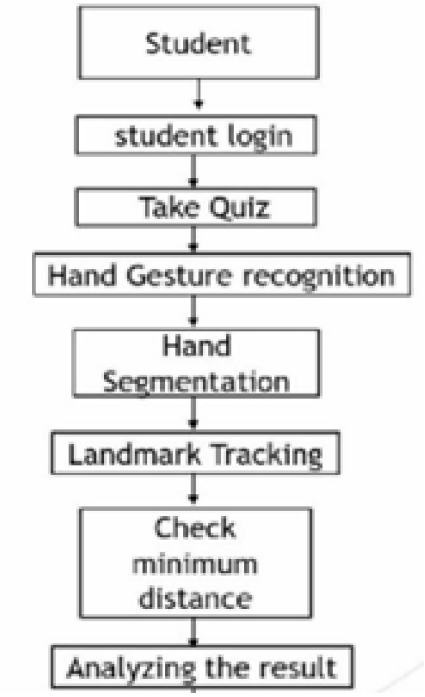

Fig: System Architecture

V. METOOLS AND TECHNOLOGY

User Authorities

When a client logs into the system for the first time, they are directed to the home page. From there they can practice quizzes that assess their own performance. He can take the quiz multiple times and the questions appear in a different

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order each time, helping him practice more effectively. After completing the quiz, the user's quiz score is displayed at the bottom of the topic page where they can review it and answer the correct questions, the incorrect questions, and the answers to all correct questions.

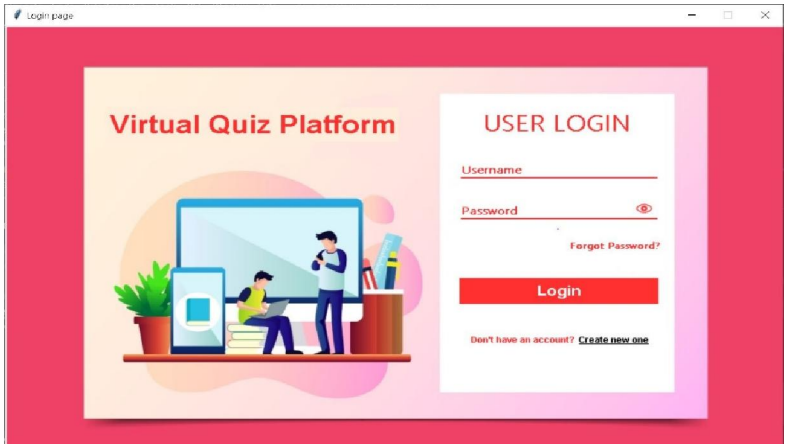

Fig: User Login

CRUD operations (Create, Update, Delete and Status)

The person who manages of this created quiz system has permissions tocarry out CRUD operations. Create, update, and delete, or CRUD, means that the administrator has full control over all tasks. He has the ability to change any registered user's name or address as well as delete any user.

Like the above figure admin can update, create and delete the question and can perform tasks mentioned in Administrative authorities section.

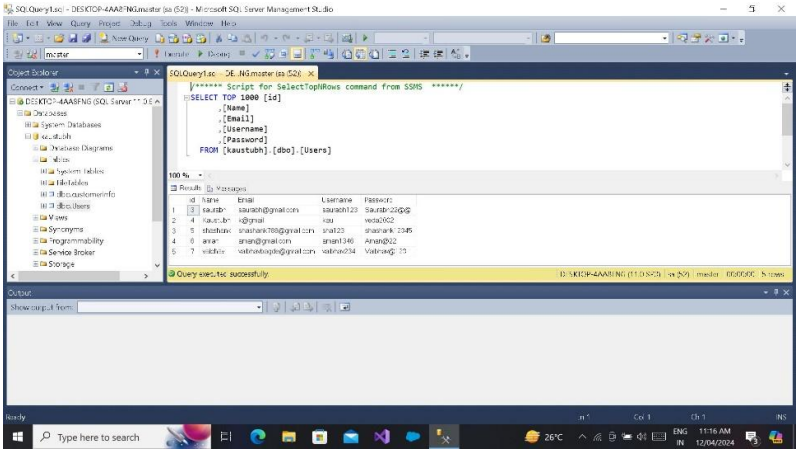

Fig: Database

VI. RESULTS

Most students agreed that the online quiz allowed them to practice wherever and whenever they wanted, which contributed to their exam preparedness. This convenience factor has been identified as one of the main advantages of the online quiz system. The findings indicate that the designed online quiz system helped students prepare for online exams and tested their exam readiness. The online quiz system is a useful tool for students to assess their level of preparedness for online tests, which are becoming more and more popular. Being able to practice anywhere and anytime gives students more freedom in their learning and gives them the flexibility they need to manage their busy schedules. Instant feedback allows students to identify areas that require more focus and adjust their efforts accordingly.

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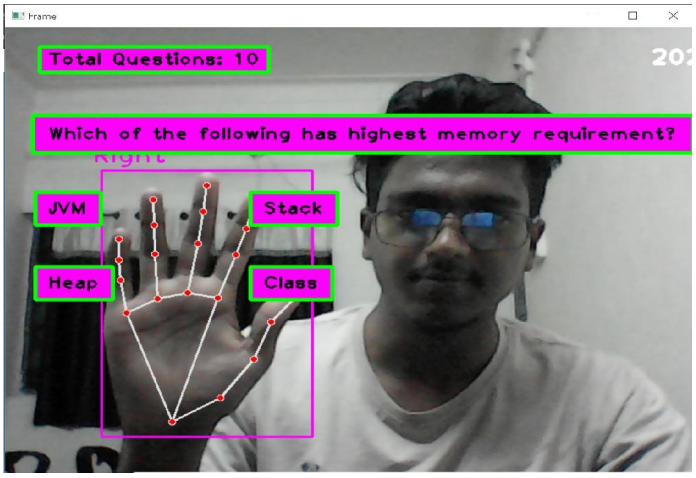

Fig: Final Output

VII. CONCLUSION

To evaluate your preparation some time recently taking a veritable online exam, we have made an online test framework. Clients can learn about online instruction, comprehend how to reply questions, and oversee their time amid real-time online exams by using the framework we have outlined. The client can look at the comes about of the hone exam after wrapping up the exam. The user can attempt the exam once more. there is no cap on hone. One individual may take online exams numerous times. This will help instructors in affirming the results of the innovation that naturally calculates marks. The manual duplicate check helps to spare time.

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FUTURE WORK

Although our quiz system is designed for multiple choice questions only, it can be enhanced with other features such as clarification questions, the ability for students to invite their own friends, and the inclusion of a dialog box. You can talk to your friends and talk about your problems. Through discussion, partners can clarify their own problems in a better way.

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