

Proctored Exam System for Hackathon Candidate Shortlisting

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Abstract. The 'Proctored Exam System for Hackathon Candidate Shortlisting' is an advanced solution designed to streamline and secure the candidate evaluation process for national and international hackathons. This system includes a secure login page, comprehensive instructions for candidates, a quiz interface with real-time webcam monitoring, and a dynamic results page. By facilitating remote exams, it ensures integrity and fairness, enhancing trust among participants and organizers. The system's proctoring features monitor candidate activity to prevent any unfair practices, making the selection process transparent and unbiased. Furthermore, by enabling remote participation, the system broadens access, attracting a diverse and talented pool of candidates. This inclusivity enriches the hackathon experience, fostering a more competitive and innovative environment.

Keywords. Proctored Exam, Hackathon, Remote Monitoring, Candidate Evaluation, Online Proctoring

Abstract. In hackathons, where the stakes are high, a fair and efficient candidate shortlisting process is essential. This project, 'Proctored Exam System for Hackathon Candidate Shortlisting', addresses the need for secure and transparent evaluations. Current systems lack the ability to ensure remote integrity and unbiased selections, leading to potential unfair practices. Our system solves this problem by integrating webcam monitoring and real-time proctoring during online quizzes, ensuring a level playing field for all candidates. The system consists of four major components: a secure login, instruction interface, quiz platform, and a dynamic results page. Webcam access is integrated through the Media Devices API to monitor participants throughout the exam, with real-time activity tracking to prevent cheating. The quiz platform dynamically adjusts for various question formats, ensuring compatibility with different hackathon requirements. The system processes scores in real-time, ensuring timely and transparent results.

INTRODUCTION

The "Proctored Exam System for Hackathon Candidate Shortlisting" is designed to address the need for secure and efficient remote assessments in hackathons. As these events grow in scale, traditional in-person exams are becoming less practical, especially for global participants. This system enables candidates to take exams remotely while being monitored in real-time via webcam, ensuring fairness and preventing cheating. The authors have developed a solution that includes secure login, live proctoring, and dynamic results, making the shortlisting process more transparent and accessible. By building on recent research, this system offers a reliable and adaptable approach to remote exam proctoring.

RESEARCH METHODOLOGY

Initial testing showed that the system effectively prevented cheating with its proctoring features. Candidates appreciated the platform's user-friendly design and accessibility. The real-time monitoring feature helped detect any suspicious behavior, increasing the overall trust and reliability of the exam process.

THEORY AND CALCULATION

In this project, the theory focuses on the application of real-time proctoring algorithms, specifically webcam monitoring and facial recognition, to detect suspicious activities during exams. The theoretical basis lies in computer vision and image processing techniques that allow the system to monitor candidate behavior and ensure exam

integrity. These techniques are tailored for proctoring purposes, ensuring that they are effective in live exam environments. The calculation section involves practical performance metrics derived from these theoretical principles. For instance, movement detection is calculated using pixel changes in webcam footage, where the system analyzes variations based on preset thresholds. This allows for accurate detection of suspicious movements during exams, ensuring a secure and reliable exam process

Mathematical Expressions and Symbols

Mathematical expressions and symbols in my project could include elements like: Expressions for calculating quiz scores or determining pass/fail thresholds based on the number of correct answers. Usage of time-related mathematical functions to manage the countdown timer and calculate the remaining exam time. Implementation of formulas or expressions to detect and measure webcam activity, such as tracking the percentage of time a candidate looks away from the screen.

- The 'Proctored Exam System for Hackathon Candidate Shortlisting' provides a secure and reliable solution for remote evaluations. Its real-time monitoring ensures the integrity of the selection process, making it an ideal tool for hackathons. This system promotes fairness and inclusivity, allowing talented candidates from diverse backgrounds to compete on a level playing field. Further improvements may include more advanced AI-based proctoring techniques to further enhance security.

- **Study Limitations:** None.

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Competing Interests: None

Human and Animal Related Study: Not applicable.

1.1.1 Formatting Figures

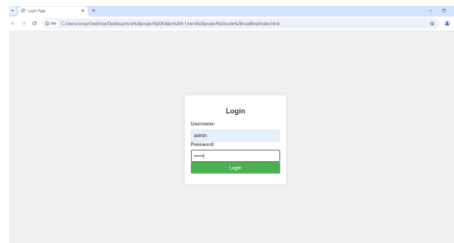


Figure 1: Login Page

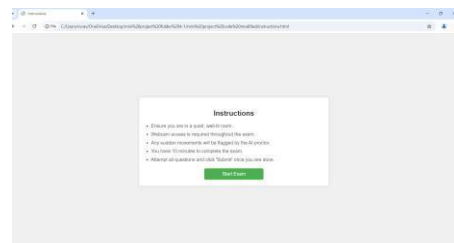


Figure 2: Instructions Page

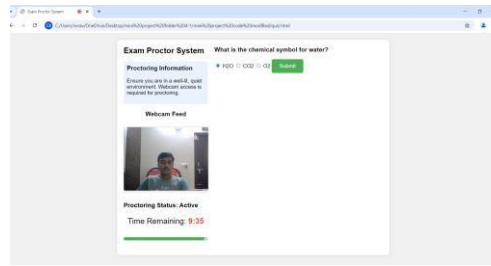


Figure 3: Proctoring phase

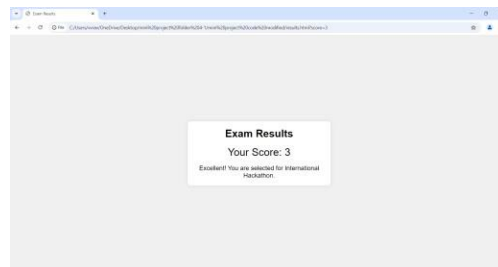


Figure 4: Results Page

2 CONCLUSIONS

The "Proctored Exam System for Hackathon Candidate Shortlisting" is an innovative solution that significantly improves the process of evaluating candidates for hackathons by enabling secure, remote exams with real-time monitoring. The system's primary outcome is its ability to ensure fairness and integrity in the candidate selection process by integrating advanced proctoring features that monitor candidates' activities through webcam access, detecting any suspicious behavior. This approach eliminates the potential for cheating, ensuring transparency and trust between organizers and participants. By allowing remote exams, the system enhances accessibility, providing a platform for candidates worldwide to participate, which in turn fosters a diverse and competitive environment for hackathon events.

The system streamlines the selection process by replacing traditional in-person exams with an efficient and secure online alternative, significantly reducing logistical challenges for organizers. However, one of the limitations of the system is that it may require candidates to have stable internet connectivity and a certain level of technical infrastructure, which could be a barrier for some participants in areas with poor internet access. Additionally, while the proctoring system is highly effective, further enhancements could include refining the monitoring algorithms to adapt to different proctoring scenarios and improving the user interface for better accessibility.

Despite these limitations, the proctored exam system has immense relevance in today's digital world, where remote work and virtual participation have become increasingly common. The system has a wide range of applications beyond hackathons, such as in academic exams, certification processes, and corporate training programs. Future recommendations include further developing the system's adaptability to different proctoring needs, improving its flexibility in various settings, and ensuring it remains user-friendly and accessible to all candidates.

3 DECLARATIONS

3.1 Study Limitations

The primary limitation of this study is the reliance on stable internet connectivity and suitable technical infrastructure, which may hinder candidates in areas with poor or inconsistent internet access. Additionally, while the proctoring system effectively monitors candidate behavior, it may require further refinement to adapt to diverse testing environments and scenarios. The system's reliance on webcam-based monitoring could also raise privacy concerns among participants. These factors could impact the overall performance and acceptance of the proctored exam system in wider applications.

3.2 Acknowledgements

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3.3 Funding source: None

3.4 Competing Interests: None

4 Human and Animal Related Study: None

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