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AI Proctor: AI-Based Platform for Remote Learning

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Abstract

Progressions in technology give headway to remote exams as a good alternative to on-site proctoring. Due to the COVID-19 pandemic, educators and institutions have been forced to rely on remote synchronous and asynchronous operations. The rapid change left weaknesses in the old systems to surface. Furthermore, it is questionable that they are equal in function to on-site proctoring. Grounded on thorough research, I determined the operation requirements for AI Proctor, a solution that solves many of the concerns with remote proctoring.

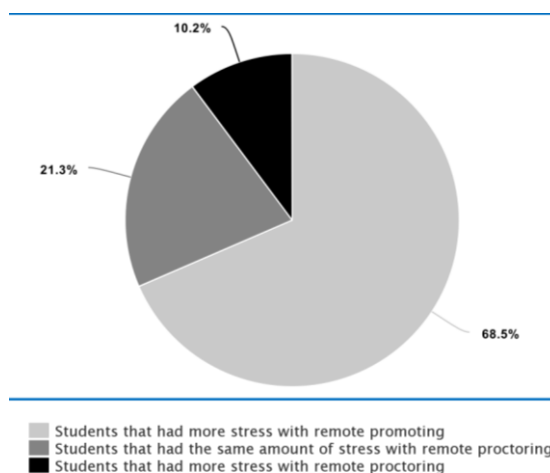**Keywords**: AI, Synchronous, Asynchronous, On-site Proctoring

1. Introduction

The rapid switch to remote education because of the COVID-19 pandemic left already available online proctoring solutions exposed with many weaknesses and flaws, this made managing remote exams very difficult. Without a physical proctor students were left more opportunities to cheat, requiring the use of remote testing sites. These testing sites had several limits on what it could and couldn't detect, in effect this made the testing experience for the students very stressful and demanding. The sites required many criteria for the student to be monitored causing an increase in pressure for the students. The results of said tests have also been affected by lacking remote proctors. Table 1.[1] Illustrates the comparison between in-person and remote exam proctoring stress levels. Privacy of students is also a concern due to complete access to students' data. Some solutions attempt to combat cheating with other applications and tools. These solutions come with their own problems,

such as more invasiveness and privacy infringement, these solutions also do not come cheap in Table 1.

Table 1. Stress correlated to proctor style

Students that had more stress with remote promoting
Students that had the same amount of stress with remote proctoring
Students that had more stress with remote proctoring

None of the available tools come even close to matching in-person levels. AI proctor is a new platform aiming to reduce the invasiveness of existing software, while adding a much less demanding experience.

2. Identifying Requirements

This primary research I reviewed is based on 200 interviews and 150 survey responses from both students and staff at a High-school. The research is also backed behind multiple narratives from both social media perspectives and literature [1,2,3,4]. I have indicated that while students are concerned with privacy and stress, staff and faculty are concerned with cheating. I concentrated this data to understand the challenges in remote education and better solutions to address them. I created a list of all possible cheating scenarios and facile solutions. I finally combine all of this data into a framework of systems that create a collection of simplistic features and functions for the AI-based proctoring tool[5].
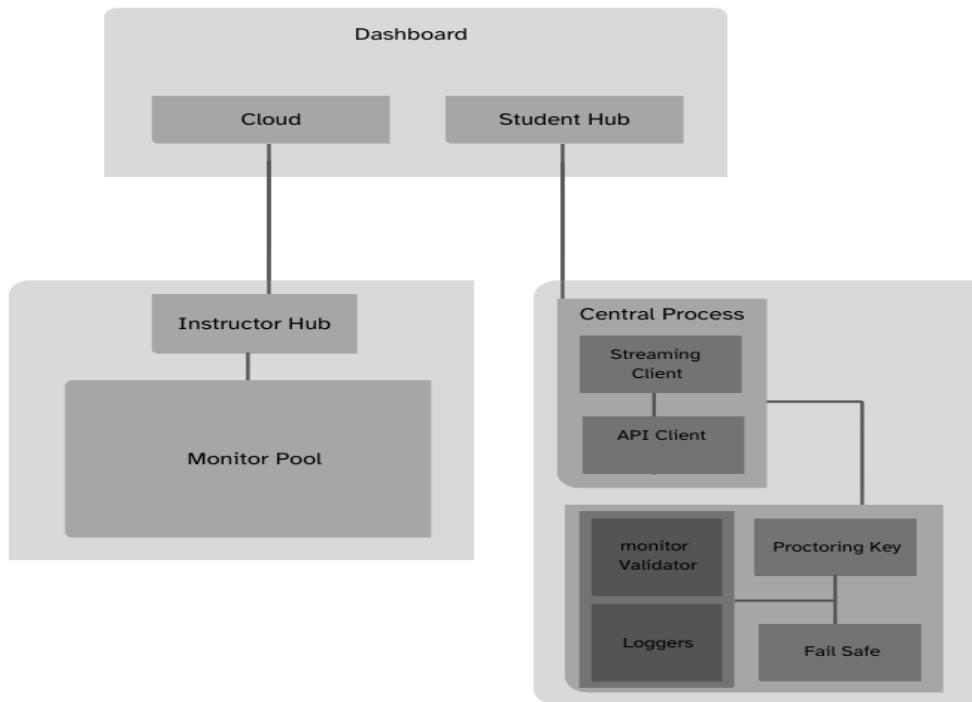
3. System Components

Fig 1. AI proctor system components

Student Hub. The student hub was designed to leave a stress free or reducing experience for remote test takers. Before the test begins all students must recite an honor code [6,7] for even further security. The student hub is equipped with a monitor validator which houses all of AI Proctors' testing measures, such as screen and video monitoring, Audio detection and recognition, and cursor watchers [8,9] to eliminate all if not most cheating attempts.

Cloud Service. The instructor hub allows teachers and instructors to have an even easier experience when scheduling exams and tests [10,11], approve sign-ups, design and customize exam features. The instructor is given very flexible options when creating exams and many options to tailor the proctor. The instructor also receives reports from the monitor pool about any suspected cheating attempts [12]. This provides the necessary security to prevent any sort of cheating. This is effective but is also more time-consuming to make sure any and all cheating attempts are thwarted.

4. AI-Powered Components

AI proctor utilizes AI components that allow various proctoring and testing features. Fig 2. demonstrates these components.
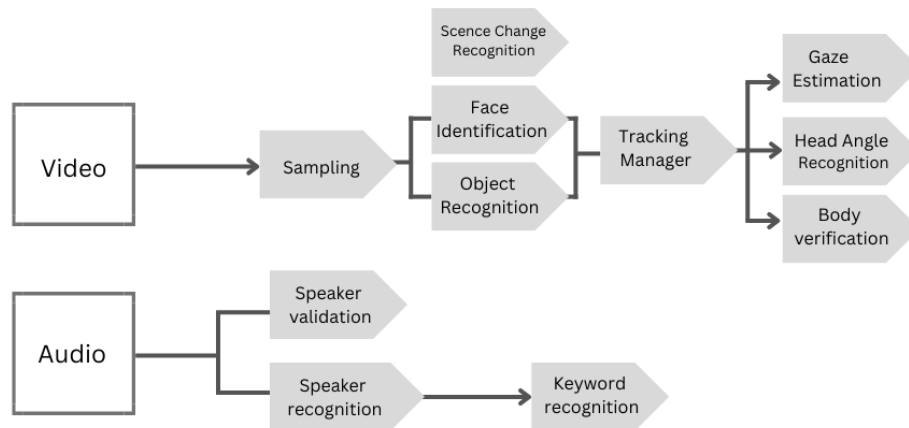
Video Solutions. Face identification authenticates a test taker's gaze, head angle, and body.

I use a sub variation of Face ID [13] and test on the SC test manager [14], providing an accuracy percent of 92%. For the verification of the test taker's gaze, head angle, and body, I utilize GoGaurdian [15]. Gaze estimation accurately determines the direction of the test taker's attention. Head angle recognition finds and recognizes where the test taker is putting any other attention on. Body verification verifies that the tester is keeping their arms and body on their computer or something else for the test. Object recognition is used to monitor parts in the user's webcam. Anything that triggers a flag such as another screen, papers, or other tools that people might use to cheat.

Audio Solutions. Unlike other remote proctors, AI Proctor uses both speaker validation and recognition. Speaker verification is used to confirm there is only one voice heard. It can differentiate both language and tone of voice. I use Veriff [16] which reports an accuracy of 67.02% across 1000 data points. Speaker recognition recognizes and transcribes all captured audio. I use CMU Sphinx [17], this software reports one of the lowest error rates of almost all audio recognition softwares at only 6.74%. Key-word extraction uses Veriff as well [16] to recognize any of the words that may trigger key-word analysis. Rapid Automatic Key-word Extraction [18,19] is also used to recognize any other triggers.

5. Conclusion

AI Proctor is a user-centric solution developed to help shape the and improve the remote proctoring challenges on both the user and instructor sides. AI Proctor addresses privacy and network issues, feasibility, affordability, and overall stress for everyone. It offers an extensive monitoring platform to prevent all forms of cheating. It utilizes distinctive AI-powered audio and visual analysis programs. As AI continues to grow and branch, so will AI Proctor. Behavioral analysis data and psychological analysis data, will be incorporated to further progress the viability and usefulness of anti-cheating mechanisms.

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