



## A Survey on Advanced Online Proctoring

Mrs. Peddaboina Yamuna<sup>[1]</sup> Associate Professor, Purra Vivek Reddy<sup>[2]</sup>, Katare Sai Praneeth<sup>[3]</sup>, Uppunuthula Akhil<sup>[4]</sup>, Siga Chandu<sup>[5]</sup>, IV B.Tech Students<sup>[2][3][4][5]</sup>, Department of Computer Science and Engineering ACE Engineering College, Hyderabad, Telangana, India

### ABSTRACT

In the past one to two years the education industry is growing with a great force. To make the students more productive most of the schools and colleges are coming with various hardware resources as well as software resources. During COVID-19 pandemic most of the organizations have conducted various meetings especially the assessments for the freshers online. It is difficult to identify whether the person taking the assessment in online mode is legit or not. This is where Online Proctoring comes into picture. Online Proctoring Services which are part of assessment are also growing with a rapid pace. Artificial Intelligence based Proctoring Systems also called as AIPS have taken the market by storm. Online Proctoring Systems also called as OPS, in general, makes use of various online tools to maintain the goodness of the assessment.

There are various parameters that need to be considered while developing Artificial Intelligence based Proctoring Systems. This paper systematically reviews existing AI and non-AI-based proctoring systems. Through the systematic search on IEEE, 49 paper were listed out from the year 2013 to 2022. We mainly focused on the existing architecture of Artificial Intelligence based Online Proctoring, parameters that need to be considered while developing AIPS, trends on how it is evolving, major issues in AIPS and What will be the future of AIPS. Based on our analysis we pointed-out that the security issues that are associated with the AI-based Online Proctoring Systems are multiplying. Major issues that can be considered while developing AIPS and OPS include Security concerns, Privacy concerns, Ethical concerns, Cost, Usage of technology and many more.

The most reasonable conclusion we can reach in the present is that the usage of the AIPS and OPS is mainly based on the trust on the tool or software. To the best of our knowledge, we can say that there is no proof of analysis on how to make online proctoring more secure. Our research moreover, addresses the issues in AIPS in human and technological aspect. It also lists out various key points and new technologies that have been recently introduced while making significant impact on online education and Online Proctoring Systems in the mere future.

### **Keywords:**

Artificial Intelligence, Online Proctoring, Online assessment.

## **INTRODUCTION**

Academics have shifted to online mode. This poses a major challenge not only from a learning point-of-view but also from the perspective of examinations. Conducting examinations without any wrongdoing is a major task to be solved. In India, the number of internet users has nearly doubled in the past 6 years. This proved to be a boon for academics as many students could continue their education. This also facilitated examinations to go online which brought the concept of online monitoring at the academic level. Web based administering implies to a computerized type of invigilation utilizing cutting edge observing software. A proctored exam allows the invigilators to invigilate remotely. They use video, audio, and various anti cheating features to maintain the exam's credibility. Manual online proctoring in the distant examination is a difficult task as many students cannot be invigilated at the same time. During manually proctored exams at the centers, a teacher can physically monitor students using all the senses. They can notice the sounds, movements of students and can easily ensure smooth conduct of the event. Online examinations restrict supervision as the teacher is not physically present at the location. A good remote online proctoring system should facilitate movement and sound detection.

## **LITERATURE SURVEY**

The web-based swindling climate of distance training has acquired foothold in the previous decade. With a couple of basic keystrokes, understudies can understand a wide cluster of online administrations for recruit to compose research papers, complete schoolwork tasks, or induct for the benefit of the understudy on record to take the whole online course. While foundations in advanced education have considered online to be as a vehicle to expand understudy enrolments adding to their primary concern, the quantity of Internet swindling organizations to help scholarly immorality has additionally expanded quickly. Difficulties managing scholarly deceit in the online region have gotten more widespread, leaving personnel and school overseers in conflict, how to forestall such conduct in both conventional and online classes.

[1] The author proposed a method to continuous user verification based on face verifications by implementing an incremental training process using images captured from m-learning online lecture sessions as training data set in order to increase the robustness against variations of pose and lighting. The algorithm is trained each time a user finished his lecture

[2] The authors have introduced a new approach for exam proctoring using 360-degree security camera. the usage of the 360-degree security camera over the traditional webcam was investigated in order to enhance the exam security and to minimize the stressful restrictions. The machine learning algorithms is exploited to enrich the proposed system. A secure frame work using the biometric is applied in order to ensure authentication and running the online exam smoothly. Similar to a tradition proctoring scenario where a proctor moves his/her eyes around and even walk around students from time to time, the 360-degree camera would provide him/her with such ability.

[3] The proposed method in this work is by applying incremental training on the deep learning face recognition training process. The images used for training are acquired from the lecture sessions where the user attends. The method is expected to keep the invariant on pose and light variations while reducing the training time and disk space dataset size which can reduce the computation load on the server. To acquired high accuracy authors have

analysed four different face detectors, which are Haar-cascade, LBP, MTCNN, and Yolo-face, as in face recognition a Facenet model was tested.

[4] The system that authors present in this work aims to provide a practical cyber-security solution for both continuous online user identification using biometric technology and monitoring using automatic signal processing and a computer monitoring system. The authentication process is based on automatic authentication of facial images, audio clips, and keystroke dynamics, checking that it is the person that it really should be during the entire online interaction. The monitoring process is supported by webcams and microphones too, checking continuously that the student is not making any inappropriate behaviour. It also locks down the computers.

[5] This paper systematically reviews existing AI and non-AI-based proctoring systems. We addressed 4 primary research questions which were focusing on existing architecture of AIPS, Parameters to be considered for AIPS, trends and Issues in AIPS and Future of AIPS. The analysis on OPS and AIPS reveals that security issues associated with AIPS are multiplying and are a cause of legitimate concern.

[6] Remote Proctored Theory and Objective Online Examination is a general idea and proposed system for establishes a network for providing a service to the examinees as well as professors. Remote Proctored Theory and Objective Online Examination's purpose is to accomplish the requirement of the institute/organizations to conduct the exam online.

[7] To mitigate the limitations of UIT, a relatively new approach, referred to as online proctoring, has been developed to mirror in-person proctoring remotely by capitalizing on technology to create verifiable and secure testing conditions. This study evaluated the comparability of online proctored and un proctored test administration in a low-stakes testing context on user-friendliness, examinee behaviour, and mean scores.

[8] According to this paper the authors present a method to avoid the physical presence of a proctor throughout the exam by creating a comprehensive multi modal system. Authors have used hardware such as web-cam to capture audio and video along with active window capture. This combination forms the inputs to an intelligent rule-based inference system which has the capability to decide whether any malpractices have happened.

## Results and Discussion:

S.No	Technology	Pros	Cons
1.	Machine Learning	Accurate, low computation cost	Takes more memory in smart phones.
2.	Face recognition, Eyes movement detection, and Sound detection	360 <sup>0</sup> camera will do the proctoring work	More expensive
3.	Deep Learning	Reducing the training time, disk space and computational	Does not provide any methods for implementing the

		loan on server	proctoring in smart phones.
4.	Multi-model biometric Technology	Provides a practical cyber-security solution for both continuous online user identification and “monitoring	Mostly specialized in the institutions that offer online courses
5.	Artificial Intelligence	The concept map shows the key points that need to be considered while designing the AIPS	User Privacy
6.	JSP, Google Firebase	Reduces the man power	Humans could not sit in the same position for two-three hours
7.	Deep Learning	The System evaluates test security	Raise anxiety around test taking
8.	Artificial Intelligence	Fully automated	The scope is restricted to single student scenario

## **CONCLUSION**

There is a high demand for AI proctored systems as online proctoring has a lot of demand these days. It is possible to create an AI proctoring system with high accuracy. Logging fraudulent activity is important to handle disputes. Making a proctoring system that is mobile compatible is the need of the hour as most students don't have computers. Through this project, we will try to show that online proctoring is the future, and using online proctoring cheating in exams can be reduced drastically.

## **ACKNOWLEDGEMENT**

We would like to thank our guide Mrs. P. Yamuna and Mrs. Soppari Kavitha for dedicating their valuable time and guidance. Also, we are extremely grateful to Dr. M. V. VIJAYA SARADHI, Head of Computer Science and Engineering Department for his invaluable time, support, Ace Engineering College.

## REFERENCES

- [1] “A Design of Continuous User Verification for Online Exam Proctoring on M-learning”  
Hadian S. G. Asep;Yoanes Bandung 2019 International Conference on Electrical Engineering and Informatics (ICEEI) Year: 2019  
DOI : 10.1109/ICEEI47359.2019.8988786
- [2] “Students Online Exam Proctoring: A Case Study Using 360 Degree Security Cameras”  
Aiman A Turani;Jawad H Alkhateeb;AbdulRahman A. Alsewari  
2020 Emerging Technology in Computing, Communication and Electronics (ETCCE)  
Year: 2020  
DOI : 10.1109/ETCCE51779.2020.9350872
- [3] “An Incremental Training on Deep Learning Face Recognition for M-Learning Online Exam Proctoring”  
Asep Hadian Sudrajat Ganidisastra;Yoanes Bandung  
2021 IEEE Asia Pacific Conference on Wireless and Mobile (APWiMob)  
Year: 2021  
DOI : 10.1109/APWiMob51111.2021.9435232
- [4] “Online Student Authentication and Proctoring System Based on Multimodal Biometrics Technology”  
Mikel Labayen;Ricardo Vea;Julián Flórez;Naiara Aginako;Basilio Sierra  
IEEE Access  
Year: 2021  
DOI : 10.1109/ACCESS.2021.3079375
- [5] “A Systematic Review on AI based Online Proctoring Systems”  
*Educ Inf Technol* 26, 6421–6445 (2021). <https://doi.org/10.1007/s10639-021-10597-x>  
Year: 2021  
DOI : 10.1007/s10639-021-10597-x
- [6] “Remote Proctored Theory on Online Exam Proctoring”  
*Sinha, P., Dileshwari, & Yadav, A. -Remote Proctored Theory And Objective Online Examination. International Journal of Advanced Networking and Applications, 11(06).*  
Year : 2020  
DOI : <https://doi.org/10.35444/ijana.2020.11068>
- [7] “Online Proctored Versus Unproctored Low-Stakes Internet Test Administration: Is There Differential Test-Taking Behaviour and Performance?”

Joseph A. Rios & Ou Lydia Liu (2017): Online Proctored Versus Unproctored Low-Stakes Internet Test Administration: Is There Differential Test-Taking Behaviour and Performance?  
American Journal of Distance Education

Year: 2017

DOI : <http://dx.doi.org/10.1080/08923647.2017.1258628>

[8] “An intelligent system for online exam monitoring”

Swathi Prathish, Athi Narayanan S and Kamal Bijlani (2016): An intelligent system for online exam monitoring. International Conference on Information Science (ICIS)

Year: 2016

DOI : <http://dx.doi.org/10.1109/INFOSCI.2016.7845315>

