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Wireless Camera based Online Examination Security

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Abstract— Online Examination has become very much popular in today's IT enabled world. It has replaced all the inconveniences of Offline Examination. But still now there is a big question regarding the security of online examination. True candidate's authentication during the online exam is a great problem. In this paper, a new methodology has been proposed i.e. IP Camera based online exam security. In this paper, we have proposed a reliable online examination system which is based on strict online security and true candidate authentication. Here the centrally operated control room will take over all the activities going on in the authorized centres through the IP cameras those are configured in every centre.

Index Terms— Online Examination, IP Camera, motion detection.

INTRODUCTION

As the Internet & web technology is growing faster in this highly IT-enabled world, today's student generation is getting more attached with the online resources more than the books [1]. The World Wide Web is the largest storehouse of Education resources to students. As per the observed statistics, approximately 5.6 million students opt for at least one online course within a year [5]. The statistic says that the students who take online guidance perform much better than those who are taking face-to-face traditional classroom education. Now-a-days online education system is very much reliable to every student. But there has a big question regarding the online exam security. In the present scheme of online exam, candidates are allocated a particular canter where he/she is allowed to take the online exam under the surveillance of a concerned institution/board assigned invigilator. If the invigilator is not strict to his duty then the students may avail the restricted resources (i.e. books, notes, guidance from 3rd party) which will decline the standard of the exam. In this paper, we have proposed a reliable online examination system which is based on strict online security and true candidate authentication. Here the centrally operated control room will take over all the activities going on in the authorized centres through the IP cameras those are configured in every centre.

CHALLENGES IN EXISTING ONLINE EXAM SYSTEM

The major drawback of online examinations is that a candidate can easily use of any unauthorized methods and can enjoy outer guidance to score good in the examination [8]. The following are the popular methods that fall in this category:

1) Using books or notes for direct guidance.
2) Taking direct guidance from a person nearby.
3) Using electronic media, stored in computer's Hard Drive, or that available on the internet.
4) Using mobile phones or pagers to communicate with second person during examination.

PROPOSED MODEL

Our proposed method, "wireless IP Cam based online exam security" is basically a video surveillance solution. The convergence of video and computer networking technology is revolutionizing the video security industry. In recent years, due to increasing security concerns, surveillance and motion detection of any objects have become essential [9-14].

Second generation solutions are entirely computer-based and can readily capitalize on existing IP infrastructure instead of requiring dedicated video cabling. IP cameras with self contained video server appliances internally generate MPEG, MJPEG, or H.264 images [3-7]. These images are made available to other devices on the network through a standard IP network interface.

Monitoring and recording can be performed by entirely software-based network video recorders (NVRs) running on standard PC hardware. Advanced video analytics software can be used to automatically

detect suspicious events or behavior without having to continuously monitor dozens or hundreds of screens. In this paper, an IP camera based security system is given where there will be one IP camera for each and every student appearing for the exam. As we are focusing on the global vendor certification exam security particularly, there will be a limit of number of appearing student in one day.

As per our proposal the number of candidates should not be exceeded more than one hundred. It is proposed here that in the control room computers, there will be a common web interface through where the activity of all the appearing candidates will be shown in a live manner through IP cameras which will be installed in the exam centers. In this model, first the invigilator will assign a particular monitor (computer) from where the candidate will take exam. Then a reference snapshot of the candidate is taken by the IP camera and the frame is relayed to the control room as shown in Fig 1. In central control room, the operator will thoroughly

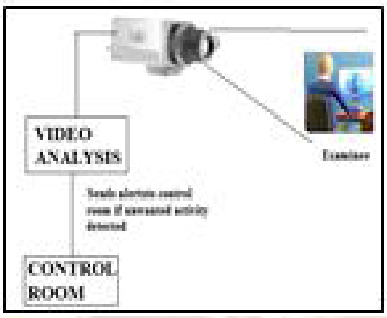

Figure 1: One IP Camera invigilates one Examinee

check the reference snapshot of the candidate whether the candidate is maintaining all the rules and regulations or not. If everything is usual then the candidate is authorized to take the exam otherwise he will be expelled right at that moment. This first authorized frame should be considered as an **'Intraframe (I)'**. This frame is used for motion detection & unwanted object detection. If some changes is occurred in I frame then **'Bi-directional frame (B)'** or **'Predicted frame (P)'** is generated. How the live video frames (I, B, P) work, is illustrated in the following figures down:

Here a particular network architecture is given in Fig 3, where there will be a control room which connecting all exam centers. In control room, there will be a database and the servers which are connected with controlling monitors. To connect the control room with the several exam centers, here it is proposed to use point-to-point protocol for the purpose of dedicated connection. Here Challenged Handshake Authentication Protocol is used to authorize a candidate for appearing the exam. It presents an integration and implementation of transmitting video and audio data from multiple Internet Protocol (IP) surveillance cameras in a network to a centralized management unit (central node) using Real Time Streaming Protocol (RTSP). The network is based on "Star" topology by using the IEEE 802.1Q series of standards in Local Area Networks (LAN). Security for communications between the exam centers and central node (control room) is achieved in real-time through the proposed uncertainty classification of network traffic with little and negligible run-time overhead for unwanted activity detection.

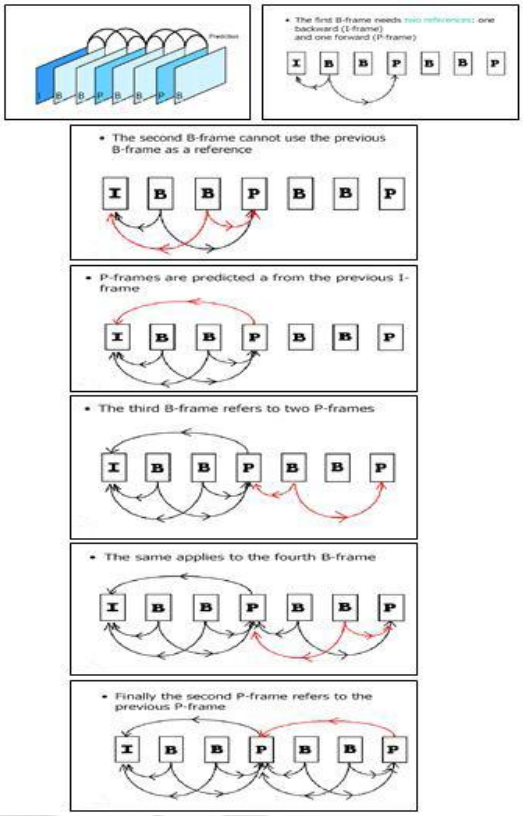

Figure 2: The above figures show how I,B,P Frame work

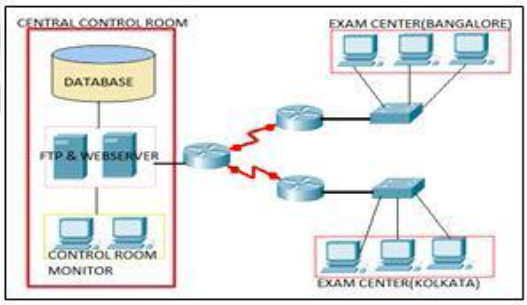

Figure 3: The Network architecture of the proposed model.

In the web interface (candidate's monitor screen) there will be an IP camera setting options through which all the security settings and the general setting will be provided for the incoming live frame instantaneously captured and routed by the installed IP camera in every exam centers. For examples, IP address and port number setting, video resolution and camera authentication information are provided as shown in Fig 5. And as for security setting some options like triggering options are configured and it is shown in Fig 6 and Fig 7. When the exam will be started, just sometimes before that automatic alerts is enabled in every IP camera settings. The procedure of how the security threat will be tackled at the time of online examination has been described by the given flow chart i.e. Fig 4.

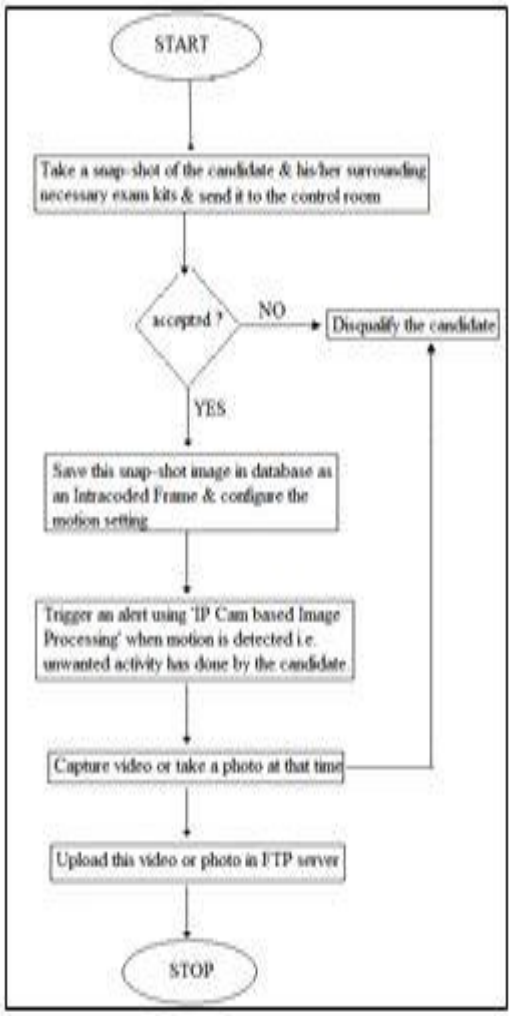

Figure 4: FLOWCHART of proposed model.

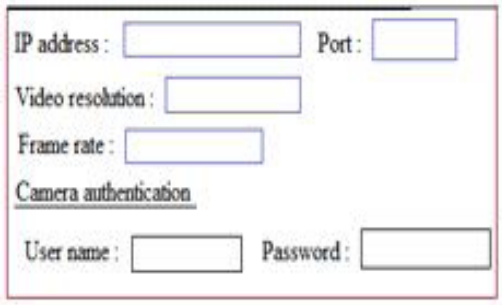

Figure 5: Connecting remote IP Camera with Control room.

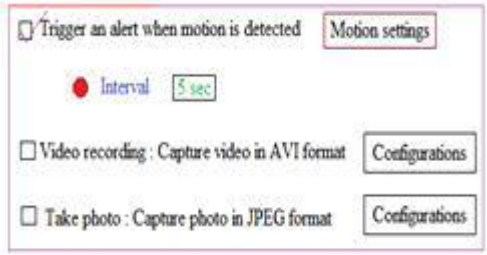

Figure 6: Procedure of triggered action.

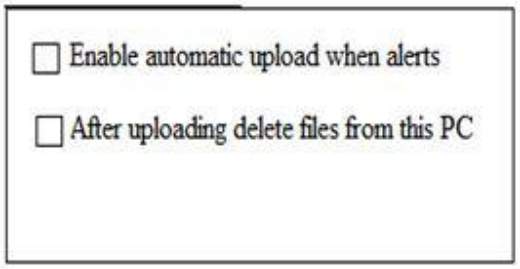

Figure 7: Upload video or picture in FTP server.

CONCLUSION

The proposed method, wireless IP Cam based online exam security is designed for global certification examination like CCNA, CCNP, CCIE, MCSE, MCTS, MCITP, OCJP etc. The numbers of dummy candidates are increasing day-by-day to crack these exam. As a result we are unable to appreciate actual hidden talents from different parts of world. One bottleneck of this proposed model is its implementation cost. Otherwise this suggested model is quite good from the exam security point of view.

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