

A MODEL for EXAMINATION INVIGILATION AUTOMATION SYSTEM USING IP SURVEILLANCE CORDLESS SYSTEM

ABSTRACT

Predictably the surveillance monitoring system is prepared in the Examination Hall and by a mount of labor or fixed invigilators. But nowadays, monitoring surveillance system can be done using ICT as a tool. This type of invigilation is less time consuming, can reduce the manpower, and can be made effective. Furthermore, it provides the user flexibility to monitor event during examination at hall. This project also deals with the movement in the video, this will be a greater help to the exam officer to observe occurrences. In the end, this project is not only to reduce the manpower but also give advantages of using Internet Protocol Surveillance Cordless System.

Keywords: Crime Monitor, IP Surveillance, ICT, Exam Invigilation

Background of the Study

A surveillance system covering a huge office building or a busy airport can apply hundreds and even thousands of cameras. To avoid communication jams, the attained video is often compressed by a local processor within the camera, or at a nearby video server. The compressed video is then transmitted to a fundamental facility for storage and display (E. Wallace et al, 2007).

Based on the modern technologies, with the set of personal computers (PC) and the internet connection either wire or wireless, the monitoring can be done. With this, the user may monitor the video wherever they want, and the random video replay functions can be provided. With these flexibilities, it gives more benefit to the user to monitor and ensure the safety place they want. It can also increase the safety of the user properties; this is because there is image processing technique apply in the system (A.C. Davies, J.H. Yin, S.A. Velastin, 2010).

Monitoring anti-social conduct and security against terrorist threats is mostly perceived to have a high priority, making invasive monitoring comparatively satisfactory and encourage the installation of advanced surveillance systems (S. A. Velastin, J. H. Yin, A. C. Davies, M. A. VicencioSilva, R. E. Allsop A. Penn, 2008).

Analog video security system

Cameras on a modern analog CCTV system send their video in the traditional base band format over coax or UTP cabling back to a digital video recorder (DVR). Here, video is digitized and stored on hard drives. Most modern DVRs are a network device, and as such can be accessed remotely from the LAN, or with the proper configuration, from across a WAN or the internet. There are no tapes to change (C. Stauffer, W.E.L. Grimson, 2007).

Internet Protocol video security system

IP video cameras broadcast their video as a digital stream over an IP network. Like an analog system, video is recorded on hard drives, but since the video is an IP stream straight from the camera, there is more flexibility as to how and where that video is recorded. The DVR is replaced with an NVR (network video recorder), which in some cases is just software since it doesn't need to convert analog to digital. Video footage can then be stored on new or existing network RAID drives as directed by the NVR software (I. Haritaoglu, D. Harwood, L.S. Davis, 2009).

Benefit of Internet Protocol Surveillance System

One of the biggest factors driving interest in IP video systems is the high resolution that they can offer. Analog cameras max out on resolution at about 580 TVL which equates to roughly 0.4 mega pixels. High end IP cameras on the other hand, are currently available at resolutions above five mega pixels. This high resolution in turn gives users the ability to zoom in on video after the fact, and still have usable video (www.ipcamera.support.com).

Statement of the Problem

The challenges facing academic institutions universities all over the globe associated to their traditional approaches examination invigilation which is labor intensive and other incident occurrences may not properly address. The following major setback include

- i. No proper evidence of student examination misconduct.
- ii. No proper record of misunderstanding scenario between student and lectures.
- iii. Labor intensive to invigilate and time consuming.
- iv. Manual descriptions of an incident event during examination.
- v. No accurate time of incident occurrences.

Aim and Objective of the research work

- i. The implementation base on installation of IP wireless camera into the lecture hall for examination supervision.
- ii. Extending security to the examination hall reach and maintaining student's honor.

LITERATURE REVIEW

MOTION DETECTION

Motion detection is the most commonly technique use nowadays. This is because their usage in many areas like video surveillance systems, traffic monitoring, gesture recognition, advanced user interfaces, sport games players tracking etc. All these applications are to identify the object of interest. (H. Tao, H.S. Sawhney, R. Kumar, 2011).

The popular optical flow technique; Horn and Schunck are a combination of the gradient constraint with a global smoothness term to be smooth in the edge region, the speed of which always sharp changes, so the edge shape of the object easily distorts to constrain the velocity field. As for the region matching it rely on determining the correspondence between the two images, by matching blocks of the other (J. Renno, D. Greenhill, J. Orwell and G.A., 2012)

By using optical flow also can detect a multiple motion in a frame because it is calculated based on the velocity of the particular object. Base on this characteristic, it can be used to extract the candidate region based on matching optical flow values (J. Renno, and D. Greenhill, 2009).

As for temporal difference, it computes the difference between two or three consecutive frames. It is good at adapting to the dynamic environments, but generally poor at extracting enough relevant feature pixels, which resulting holes are generated in the moving object and cannot detect the entire shape of a moving object with uniform intensity (B.A. Boghossian, 2009).

DISTANTLY EVENTS SURVEILLANCE

IP-based camera used in a remote monitoring station for intelligent image processing. In order to provide enhanced security, events need to be integrated with a command and control system capable of effectively responding to hundreds of events per day in a busy, critical infrastructure facility. Other than IP-based camera, pan, tilt, and zoom (PTZ) camera also can be used in remote monitoring. The PTZ itself may refer to the feature for the security camera. It also can be used to describe an entire category of cameras where a combination of sound and/or motion and/or change in heat signature may enable the camera to activate, focus and track suspected changes in the video field (S.A. Velastin, B. Boghossian, B. Lo, J. Sun, M.A, 2009).

AUTHENTIC TIME DISCOVERY

Motion features are derived from the motion vectors. Relying on motion vectors rather than on pixel data reduces the input data rate by about two orders of magnitude, and allows real-time operation on limited computational platforms (S.A. Velastin, 2010).

To perform this method in real-time and with high accuracy, we design every block carefully. Since the consecutive temporal difference approach requires no background model and little

memory, this approach is quite efficient and accurate in that it has a low computational cost and it adapts quickly to the changes of the background (M. Valera, S.A. Velastin, 2009).

SYSTEM NETWORK

There are two types of cameras in the monitored site. One is the global camera, which captures the global view of interest. The other is tracking cameras, controlled by VMS server to track the intruders. In order to keep the recorded images safely, the captured images are stored in a VMS server as well as VMS DB server. In the case users request real time image monitoring, the system connects to the VMS Server. On the other hand, the system connects to the VMS DB server if users query stored images (<http://www.prismatica.com>).

A network-based visual intelligent surveillance system is mainly composed of cameras, client computers, a server computer and a HUB. The clients include video capture module, change detection module, classification module and network sending module. The server includes network listening & receiving module, camera analysis module, a digital monitor and log & image database. The video capture Module on each client can capture video sequence from four cameras. So, there are four clients in all. All sixteen cameras are connected to the corresponding video capture card on the client computers on the one hand, and connected to an analog sixteen-picture-division monitor on the other hand. On the natural situation, sixteen pictures come from sixteen cameras are simultaneously shown on the analog division monitor (Eds. S.A. Velastin, P. Remagnino, 2009).

Research Methodology

The procedure of the project consists of two (2) fundamental divisions.

- i. The problem was specified through interview (physical interactive) with users of the system, relevant foundations identified and groundwork propose developed. This included glancing for resolutions and evaluating them.
- ii. The project serves as a model to develop continuous feedback from the Chief Examination Officers and the Chief security of the institution.

The actualities obtained from were critically appraised and examined in order to fill the gaps of traditional invigilation processes of may have absent.

Feasibility of the Research Study

The standard of useful study is to illustrate the setback and come to a pronouncement whether or not a modernization system is feasible. In feasibility study, a brief study of the accessible confronts is made and the substitute way out is then determined. Below feasibility study breakdown of the following is necessary:

- i. Man Power Necessity: The potential level of the employees prepared that can successfully deploy the technologies mechanism being proposed.
- ii. Practical Requirement: This engages the strength of mind of technical usage of the processes entailed in implementation the operations that are needed.

An efficient viability study was carried out at schools to resolve how feasible the intended system will be of benefit to the institution. Some fact was made about existing system surrounded with labor-intensive, no evidence of malpractices and event scenario as proper captured.

Methods of Capturing Information for the Research

To carry out this research, two techniques were employed during the operation namely

- i. Interview Technique
- ii. Observation Technique

Interview Technique

The dialogue procedure is employed for compilation sequences vocally through questions pretense by the researcher. Some selected human resources of the managements were interviewed.

The subsequent difficulty was inquired.

- i. What are the procedures engaged?
- ii. What is the boundary compelled by time and the quantity of exertion?
- iii. What kind of procedure engages?
- iv. What system do you operate and maintain for processing?

These difficulties and supplementary essential information were gathered appropriate necessitate information desirable for the effectiveness carrying out this research work.

Evaluation of the Existing System

The approach of operation at institutions is identified as hierarchical order referencing the following:

- i- It traditional way of invigilation during examination hall.
- ii- No centralized collective information scenario occurrences resource storage.
- iii- Records of event occurrences take time before reviewing.
- iv- Fixed practice of invigilation involves a lot man power.

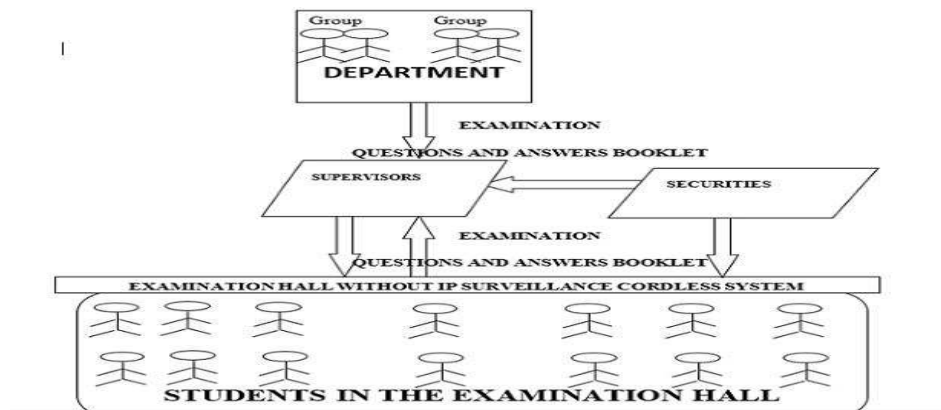


Figure 1: Existing System Data Flow Diagram

Proposing A New System

Before proposing a new system, the researcher, took into awareness the effects of the set back of examination malpractice to the institutions. Everything on the surface of the earth, both living and non-living or abstract is inclined to changes. The researcher thought it wise to proceed into exploring the possibilities of implementing an efficient, durable, reliable and more productive system which will curb the excesses of the current system. This gave rise to the researcher's topic implementation of a network backbone monitoring system using OSI layer 2 devices, Figure 2.

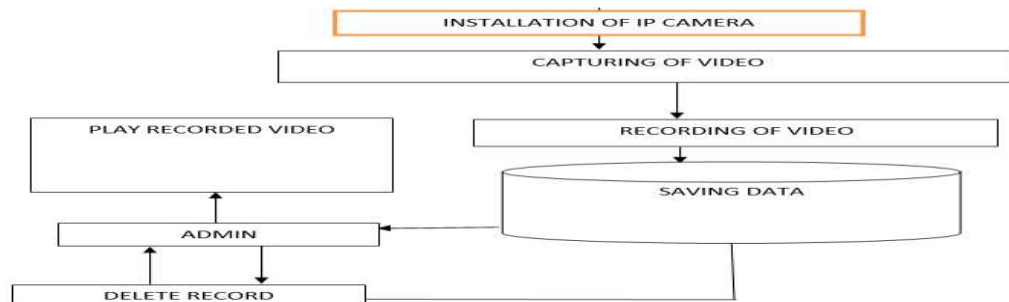


Figure 2: New System Data Flow Diagram.

From the diagram above the administrator or the personnel does the major task of running the application of the inbuilt digital video software. Thereby selecting different roles to execute, such as recording the event or just watching from his workstation.

Advantages of the Proposed System

The surveillance monitoring system is prepared in the Examination Hall and by a mount of manpower or fixed invigilators.

Monitoring surveillance system can be done through physical and cordless Network. This type of invigilation achieved the following goals:

- i. To less time consuming and can reduce the manpower.
- ii. To provides the user flexibility to monitor event during examination inside hall.

This project also deals with the movement in the video, this will be a greater help to the exam officer to observe occurrences. In the end, this project is not only to reduce the manpower but also give advantages of using Internet Protocol Surveillance Cordless System.

Implementations and Configurations

These chapters provide methods to setup connections for wireless IP bullet camera, IP IR dome camera, IP IR waterproof camera, IP Pan/Tilt/Zoom Camera etc. It adopts high performance chip to ensure high quality media processor which processes audio and video collection, compression and transmission. Standard M-JPEG compression format ensures clear and streaming video performance. It enables users to view live video via IE6.0, IE7.0, IE8.0, Firefox, Google browser or another standard browser.

Setting up Internet Protocol Surveillance System

There are two kinds of panels of Wanscam AJ series IP camera mainly divided into two kinds: one is body guard interface, the other is the extend line interface, set two representative products as examples



Figure 3: Non-extended line IP Camera



Figure 4: Extended line IP Camera

Main Interface of AJ Series

The interface indicated available ports for connections, the camera supported wired and wireless port for connection / configuration option suitable for the human ware.



Figure 5: Back view of an IP Camera



Figure 6: Back Extension Connector

Installation and Configuration of Cordless Surveillance



Figure 7: Connection Via A Router

- i. Connecting the camera to the local network
- ii. Power on the camera in close proximity to the router
- iii. Directly connect the camera to the router using the Ethernet cable.
- iv. If the yellow and green indicator lights on the camera are blinking, then the camera is successfully communicating with the router.
- v. Insert the software CD included into the PC.
- vi. Run the program labeled “OCX Setup” form the file folder on the software CD.
- vii. After the “OCX Setup” program has installed. Please run the “Search Tool” software. This software is used to search the IP address of the IP camera in the local network.

Note: “Search Tool” Software don't need to installed, if needed, it can copy it to the desktop of the PC.

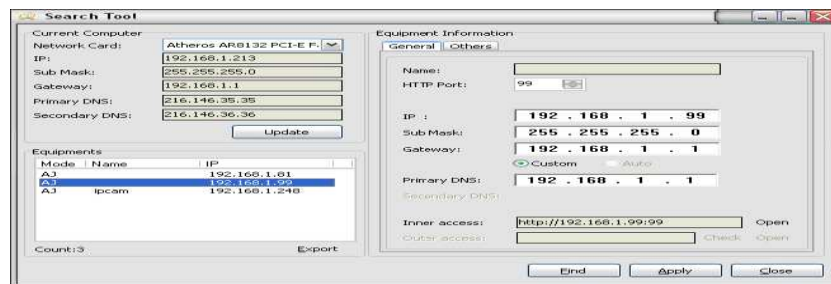


Figure 8: Search Tool Interface

- viii. Click “Find” to find the IP Camera on the router. (If there are several items on the router, check the bottom of the camera for the factory IP setting.)

From the Search Tool, Select the IP camera. Here, it is needed to re-address the camera’s IP address based off of the Local Network Default Gateway. For example: If the Default Gateway is 192.168.1.1, change the last set of values of the address from 1to a larger value such as 99. Therefore, the new address will read “192.168.1.99” (The last set of values must be lower than 254).

- ix. Next, change the Gateway and DNS IP address in the network setting to exactly match your Default Gateway.
- x. Now Change the Data Port to 80.
- xi. Last click “Apply” enter the Username and Password. The Username will be “admin” and the Password field will remain empty.
- xii. Last, click “OK” and your camera will automatically reboot as it saves all changes that you have just made.

Prompting the Necessary ActiveX Controls

The first time the camera is access online from a computer, the three necessary ActiveX controls needs to be prompt.



Figure 9: Home Page OF Internet Explorer

- Click on “Tools”



Figure 10: Internet Explorer Tools Dialog Box

- Select “Internet Options.”

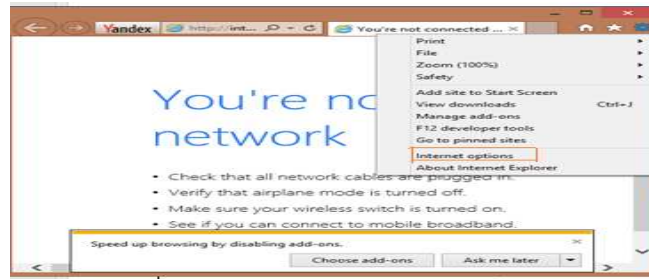


Figure 11: Internet Explorer Tools Dialog Box

- Select the “Security” tab

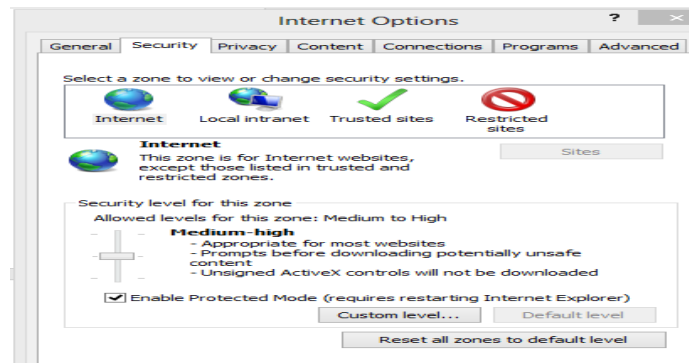


Figure 12: Internet Options

- Then click the “Custom Level”



Figure 13: Internet Options

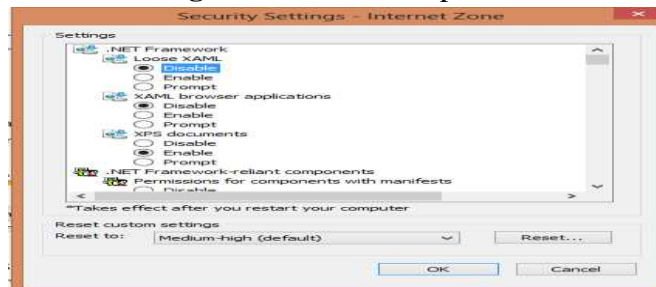


Figure 14: Security Settings – Internet Zone

If you are using either Windows Vista or Windows 7, please run Internet Explorer as Administrator. Now, change the tree following options to “Prompt”:

- Download Signed ActiveX controls
- Download Unsigned ActiveX controls
- Initialize and script ActiveX controls not marked as safe for scripting.

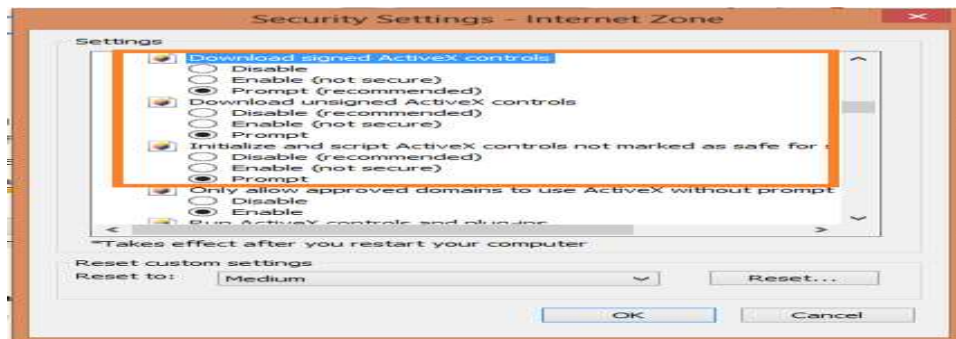


Figure 15: Security Settings – Internet Zone

Prompting the Necessary ActiveX Controls-Continued

This will usually prompt or a bar may appear on the top of the page. If prompted, select run or install. Click on the yellow bar to proceed.



Figure 16: Run ActiveX Control

If Internet Explorer version 9.0 is been used, this prompt bar will appear on the bottom of the browser instead of at the top of the browser.

4.6 Logging into the camera from a local internet location

- a. To access the camera from a local connection, open an Internet Explorer browser. In the browser, type Http://192.168.1.99

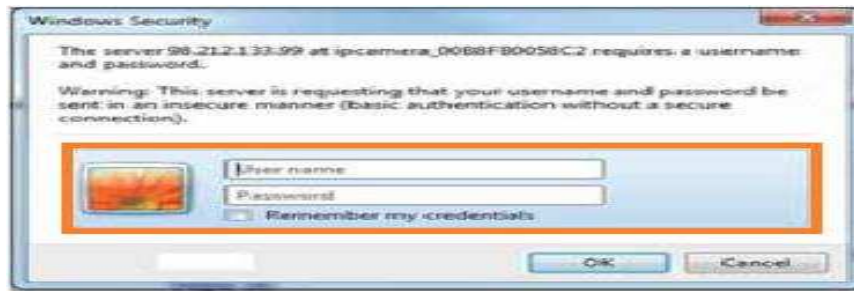


Figure 17: Window for User's Login Details And Password.

Enabling Wireless Connection Using A Wireless Router

- a. While the camera is still connected directly to a router with an Ethernet cable, go to the Wireless LAN Settings section on the camera's menu.
- b. Click 'Scan' to search for available wireless networks.

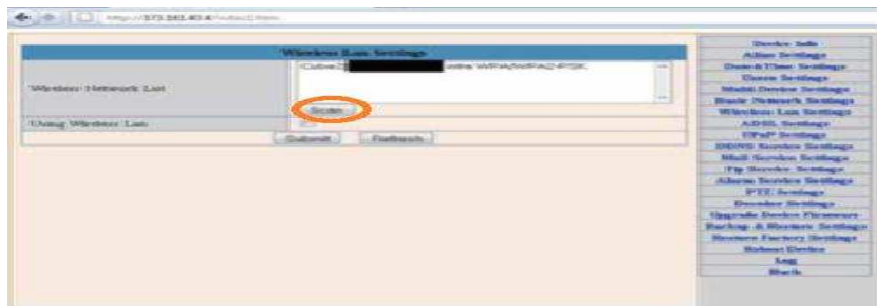


Figure 18: Interface To Search For Available Wireless Networks

Once the wireless network is selected, enter the wireless network's password into the "Shared Key" field.

- c. After the submit button is click the camera will automatically reboot to save these settings. Please wait 30 seconds after the camera has rebooted, then disconnect the Ethernet cable that is connecting the camera to the router.
- d. The camera will now be successfully communicating wirelessly with the wireless router.

Main Interface to Access the Cordless Camera

The output viewing from the cordless IP camera and control to manipulate the viewing.



Figure 19: Output View

SUMMARY And CONCLUSION

Summary

Accessibility, usability and stability are the most important landmarks surveillance system that can be done through Wireless Local Area Network. This type of invigilation is less time consuming and can reduce the manpower. Furthermore, it provides the user flexibility to monitor event during examination at hall. This project also deals with the movement in the video, this will be a greater help to the exam officer to observe occurrences. In the end, this project is not only to reduce the manpower but also give advantages of using Internet Protocol Surveillance Cordless System.

Conclusion

The principal aspired is achieved by set of connections Surveillance Cordless System that provides the user flexibility to monitor events at the examination hall. This project also deals with the movement in the video, this will be a greater help to the exam officer to observe occurrences. Other objectives have arisen along the way including flexibility, accessibility via wireless, Timeliness, storage information durability and allow effectiveness in the utilization of electronic surveillance system.

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