KALYANI GOVERNMENT ENGINEERING COLLLEGE

Department of Computer Application



**Soft Skill and Interpersonal Communication**

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**Title: Advance Video Surveillance System**

**Declaration**

I hereby declare that major project entitled **“Advance Video Surveillance System”** has been carried out by own efforts and facts arrived at my observation under the guidance & motivation of subject teacher **“MS. SWATI PRADHAN”** madam.

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**CERTIFICATION**

This is to certify that **Rajendra Kumar Shaw,** student of MCA, 1st semester has

successfully completed the project **“Advance Video Surveillance System”** under the

guidance of **“MS. SWATI** **PRADHAN”** madam during year 2022-2023.

**Principal’s Signature** **Teacher’s Signature**

**ACKNOWLEDGEMANT**

We solemnly declare that for to give the guidance of our project, Swati Pradhan mam has immensely helped us. His active participation in the project provided us with a lot of confidence for fulfilling such an interesting work. The satisfaction that accompanies the successful completion of the assignment would be incomplete without sir whose ceaseless cooperation made it possible.

Thank You!

Rajendra Kumar Shaw

**Abstract**

Over the last few decades, remarkable infrastructure growths have been noticed in security-related issues throughout the world. So, with increased demand for Security, Video based Surveillance has become an important area for the research.

An Intelligent Video Surveillance system basically censored the performance, happenings, or changing information usually in terms of human beings, vehicles or any other objects from a distance by means of some electronic equipment (usually digital camera). The scopes like prevention, detection, and intervention which have led to the development of real and consistent video surveillance systems are capable of intelligent video processing competencies. In broad terms, advanced video-based surveillance could be described as an intelligent video processing technique designed to assist security personnel’s by providing reliable real-time alerts and to support efficient video analysis for forensic investigations.

This topic deals with the various requirements for designing a robust and reliable video surveillance system. Also, it is discussed the different types of cameras required in different environmental conditions such as indoor and outdoor surveillance. Different modelling schemes are required for designing of efficient surveillance system under various illumination conditions.

Keywords: surveillance system, AIVSS, digital camera, types of camera, background model, illumination.

**Tables of Contents**

Abbreviation 1

Video surveillance system design requirements 2-4

Video management system 4

Types of Video management system 4-5

Storage type Required 5-6

Results 6-8

Conclusion 9

Future scope 9

References/Bibliography 10

Appedices 10

**List of Figures**

Figure:1………………………………………………………..page-2

Figure:2……………………………………………………….. page-3

Figure:3……………………………………………………….. page-3

Figure:4……………………………………………………….. page-3

1

**List of symbol/abbreviation**

IP - Internet Protocol

DVR - Digital Video Recorder

HDVR - Hybrid Digital Video Recorders

NVR - Network Video Recorder

CCTV – Closed Circuit Television

CD – Compact Disk

DVD – Digital Versatile Disk

LPR - License Plate Recognition

2

**video surveillance system design requirements:-**

The design of a video surveillance system requires decisions that need familiarity

with the basic options and the basis behind the selection of any available choice in the market.

The following decisions are to be made for designing of video surveillance system are as follows:

|  |  |  |  |
| --- | --- | --- | --- |
| 1. | Camera and its type | Fig 1 |  |
|  |  |
| 2. | Video management system |  |  |
| 3. | Types of Video management system |  |  |
| 4. | Storage type |  |  |
| 5. | Types of video analytics |  |  |
| 6. | Surveillance video display |  |  |



As we know that the cameras are the key contributors to the video surveillance system. The camera position and the type of cameras used under various conditions are important factors in video surveillance.

**Positions for camera installation:** Cameras should be placed in appropriate areas to record relevant video. The appropriate areas for proper placement of cameras can be entrances, hallways, driveways, T- Points, highway intersection points, exits, etc., and in areas where there is a high density of people or vehicles. Moreover, cameras can be placed in areas that require security such as parking spots, VIP areas, schools, restaurants & hotels, bank locker rooms, hospitals, etc. Planting cameras at crucial and suitable points is a cost effective way to monitor and document people and vehicles arriving and departing certain facility.

**Type of cameras to be used**: There are many types of camera available on the market.

The suitability of the camera depends upon the situation in hand.

**3**

1. **PTZ camera:** One of the commonly used camera for security purpose is PTZ camera; where P stands for Pan, T for Tilt and Z for Zoom. Pan, Tilt, and Zoom are the main features of this camera which is controlled by a software or via joystick. This security camera Advance Intelligent Video Surveillance System (AIVSS): A Future Aspect 5 has an ability to rotate 360 degrees so that it can cover a wide area and can zoom into detail. The other features that abstract toward this security camera are Weatherproof, Night Vision, Multiple Alarms, Auto Focus, and Tamper Resistant.



Figure:2

**b. Box camera:** Box type security camera is an outdoor camera where customization of the lens is possible. The lens can be variable or boxed. Box surveillance camera is an ultra -high-resolution CCTV camera made with the new image sensor processor which is capable of capturing video at 700 TV lines of resolution in colour and black & white, 960H CCTV resolution. This box camera includes a 6 -60 mm variable focal auto -iris lens which gives security installers a lot of flexibility to adjust the camera angle of view and zoom level.



Figure:3

**b. Dome camera:** It is a combination of lens ,camera and ceiling mount package in a dome shape. This is well suited for surroundings that tend to get dirty, like kitchens and storerooms, etc., the best part of it is compact in size and artistically very attractive too.

1. IP camera: An Internet Protocol camera generally transmits a digital signal using Internet

Figure:4



Apart from that there is

4

**IP camera**

**Wireless IP camera**

**Bullet camera**

**Day& night camera**

**Thermal camera**

**Video management system**

Video management system is the recording and management of access to the video, which is captured by a camera and is then transferred to the module of the video surveillance system . There are two types of connections through which the captured video is transferred:

1. Videos can be transmitted over the computer network IP or they can be sent as analog videos. Videos from both IP cameras and analog cameras can be transferred over the computer network whereas unlike analog cameras, IP cameras can connect directly to an IP network. In case of analog cameras, an encoder must be installed to transmit analog video over IP. The input from an analog camera is encoded and output a digital stream for transmission over an IP network.
2. Depending upon whether IP camera or analog video camera is used, the captured video can be transmitted over cables or through the air. Cables are generally considered inexpensive and the most reliable method of transferring video but, wireless is an important alternative for transmitting videos as setting wires can be expensive for certain applications such as parking lots, fence lines, remote buildings, etc.

**Types of Video management system**

The video management systems usually used in video surveillance systems are:

1. In a DVR videos are recorded from a surveillance camera on a hard disk. It is a security system device in which the rate of the frame can be converted from

5

real-time to time lapse to save the disk space. They are more flexible as compared to earlier analog VHS tape systems and allow easier transmission of video over a computer network.

1. HDVRs support IP cameras. They can perform all the functions of a digital video recorder mentioned above and adds support for IP and megapixel cameras.
2. NVR supports IP cameras only, however, to support analog cameras it requires an encoder. NVR can record videos from a no. of digital CCTV cameras that are transmitted over the network.

**Storage type Required**

In a video surveillance system, storage of the surveillance video is very vital. This video is used for later retrieval and review. Cost of storage and security related fears specific to the application of the video surveillance system determines the duration for which the video should be stored . For example, in supermarkets and restaurants video recordings are kept for a relatively shorter duration as compared to the bank where there is a greater need to hold videos for a longer duration (60–90 days) as there is a major threat of fraudulent investigations that are often reported after many days of the incident. The digital data is stored permanently in the

storage, till it is purposely deleted. Even without power, this source holds its content. Storage generally means magnetic disks, solid-state disks, and USB drives and may also refer to magnetic tapes and optical discs like CDs, DVDs, etc. Although storage prices are falling, the

6

demand for the surveillance system and for the amount of storage is rising. Several techniques have been developed to optimize the use of storage because of its high cost. There are three main types of storage:

1. Hard drives that are built inside a digital video recorder, network video recorder or server represents the internal storage. It is the most reasonably priced but may be less reliable and scalable. Most frequently it is used in video surveillance systems and can provide a storage of 2 TB to 4 TB.

**Results**

**1: Deter Crime**

As will be shown, security cameras can dissuade property damage while reducing crimes like trespassing and burglary. While various factors contribute to such a trend, the implementation of security camera systems undoubtedly has had an effect on preventing criminal activity like property crime. According to a study by UNC, outdoor security cameras reduce the chance of property crime by at least half. Such evidence proves that surveillance has an extensive effect by benefiting homes and businesses.

**2: Monitor Scenarios and Activities**

When away from the home or business, there might always be a worry that something might happen. Especially for parents, thoughts of your family’s condition or how your kids are doing with the babysitter might be weighing heavy on your mind. Surveillance, especially indoor security cameras, help to provide peace of mind when away from home by giving the mother or father the ability to make check-ups as frequently as needed.

Similarly, for business owners, the ability to regularly check up on daily business practices is a regular ability for those with security cameras. Such an ability allows managers and business owners to be offsite for whatever reason while regular staff can handle onsite work.

7

**3: Gather Evidence**

Having cameras installed in strategic places comes in handy when you need to monitor actions and words of people or during an event. Modern security cameras are not only equipped with high-quality video capabilities, but audio as well. The clear images coupled with flawless sound makes them more efficient than ever at recording a series of happenings.

**4: Arrive at the Right Decisions**

Footage from security cameras can help you make correct and fair decisions when settling disputes, both in domestic as well as professional scenarios. Whether it is dealing with a situation involving disagreements within your family, among your employees, or between a customer and your service staff, your doubts can be laid to rest with the help of your camera.

**5: Maintain Records**

Security cameras are an excellent option when looking to keep a record of the goings-on in or around a business. Also applicable for homes, surveillance easily monitors how events transpire, how accidents or unintended events may go, and can be used as a reference for future consideration. Businesses can use cameras to monitor incoming traffic, especially with the help of access control and security turnstiles, while homeowners can maintain a record of whom visit their property.

Disadvantages for Security Cameras

**1: Privacy Is an Issue**

While security cameras can be watchful for threats, illegal behaviour, or aggressive behaviour, surveillance will also inevitably record everything in their vision. Dome cameras, for example, are commonly placed in offices and warehouses. Schools, as another example, typically feature security cameras to monitor parking lots and keep the perimeter secure. However, such surveillance inevitably records everyone ingoing and

outgoing through the school. Furthermore, facial recognition and LPR cameras have an extensive capability to focus on specific qualities when within their view.

8

1. **It Can be a Costly Affair**
2. **They Can be Vulnerable**
3. **Can’t Stop Theft**

It is true, security cameras deter thieves, but they will not have much effect on those that are determined to commit a crime.

**9**

**Conclusion**

Smart video surveillance system significantly contributes to situation awareness. Such systems transform video surveillance from data acquisition tool to information and intelligence acquisition systems. Real-time video analysis provides smart surveillance systems with the ability to react in real-time. Our system senses the intrusion and sends notifications to authorized persons so that action can be taken in response to the intrusion.

**Future Scope**

There are several improvements can be made significant to this project. Followings are the recommendations:

1. The system can be developed by employing Wireless Sensor Network (WSN). Itis a specialized wireless network that consists of several sensors. The sensor nodes able to communicate each other and form a network by employing wireless interfaces .The collected data and information is then will be pass to the base station

to allow the access from remote user through various communication technologies.

Hence, more sensors will be available to enhance the security of the house.

1. Besides that, this project can be improved by replacing real time image-capturing surveillance system by wireless video surveillance system. The user can watch live video feeds from each video camera which have been set up in the home. Outside cameras can help detect if there is someone lurking about the property, 47or show when the kids arrive safely home from school. Therefore, the reliability of the system can be further increased.

10

**References**

1. [https://www.researchgate.net/publication/328955979\_Advance\_Intelligent\_Video\_Su](https://www.researchgate.net/publication/328955979_Advance_Intelligent_Video_Surveillance_System_AIVSS_A_Future_Aspect) [rveillance\_System\_AIVSS\_A\_Future\_Aspect](https://www.researchgate.net/publication/328955979_Advance_Intelligent_Video_Surveillance_System_AIVSS_A_Future_Aspect)
2. <https://forum.huawei.com/enterprise/en/introduction-to-advance-intelligent-video-surveillance-system-aivss-a-future-aspect/thread/806357-887>
3. <https://www.intechopen.com/chapters/61410>
4. <https://www.a1securitycameras.com/blog/advantages-and-disadvantages-of-using-security-cameras/>
5. <https://www.coursehero.com/file/p4a43u4/In-conclusion-an-intelligent-remote-home-surveillance-system-has-been/>

**Appendices**

Surveillance systems have to cope with several challenges, including, but not limited to, algorithmic and infrastructure challenges. Thus, surveillance systems have to adapt with the emerging network and infrastructure technologies, such as cloud systems, in order to provide more robust and reliable services. This trend will also demand the integration of different surveillance systems for extracting more useful knowledge. This integration will require new communication protocols and data formats between surveillance agents, as well as new surveillance adapted databases and query languages. Finally, more accurate algorithms are required, especially in the context of behavioural analysis and abnormal activities detection.