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Camera Based Smart Surveillance System

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Abstract- This paper is the survey of Smart camera based surveillance monitoring system using Raspberry pi. Camera based surveillance is important in all sectors, they can be colleges and hospitals, shopping malls and other challenging indoor and outdoor environments require high end cameras. This paper focus on low-cost project on single board computer Raspberry Pi. This is new technology and far less expensive and, it is being used as a main platform for video detection and acquisition. It can be used with involvement of mobile network (internet) to provide essential security and surveillance to our properties and for other control applications. The security system records information and transmits it via network to a Smart Phone using web application Raspberry pi.

Key-Words: Raspberry Pi, Python, MPEG-2 Algorithm, Short Message Service, Application.

INTRODUCTION

Rapid growth in the technology has result in increase in the risk of all factor like thief, terror and all. Security camera usage permits individual to keep monitoring his/her property. The many counts of foundations and growing companies use security cameras with the thinking to save entire business, property and all from terrorists, loot, thief and illegal entry. In present days, the security cameras step forwarded to much more featured, advanced, efficient, smaller [1,5].

a) Benefits of Video Surveillance

1. Availability- Once upon a time camera-based security system were only used in malls and shopping centers. In days, we can see the people are much concern about security so they put this system in all places like school, college, hospital and in holy places too. As a result, they offer a greater public security at a minimum cost.

2. Monitoring in real time – Back in days, big organizations have always had the benefits of video surveillance manned by security professionals. In the past times the capturing and transferring used to take time. But latest technologies facilitate users to check and reply to alarms[4].

b) Need of Smart Surveillance?

Nowadays people are busy and in busy life they do not have enough time to monitories and to keep a watch on all things. From each family most of the members are working, or even in stores and all places to monitor each and every place is not possible. It is 2021 and we need to think smartly to make our and others life better, happy, tension free and secure, so instead of being at once place for a while, why don't you carry the security in our pocket[2].

1. LITERATURESURVEY

The early system deals with drawback like cost, stability, security, performance, storage and many more that resist to make it perfect. To overcome these problems Raspberry Pi is combined with system, and which combing with the Windows and Raspbian operating system. Video capture done by our minicomputer [11].

This paper includes some advantages such as higher intelligence, more stability, and easy installation and disadvantage as it requires high cost and continue mobile network is required to get operated, and the network is important for application. Below is the diagram showing the flowchart that has been in[3] .

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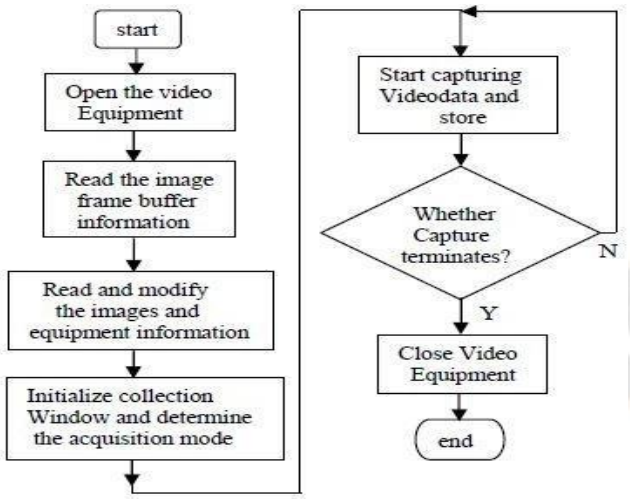
Chart -1: Flowchart of V4L video capture



In the implementation and design of a camera-based surveillance system, the video totally up to mobile Internet access. Database in the VCS to automatically save selected clip of the video. Figure 1 shows the Architecture of video surveillance system. A high speed video acquisition sub-system using particular protocol in our security system is there. The architecture of video surveillance system that is used is shown below[17].

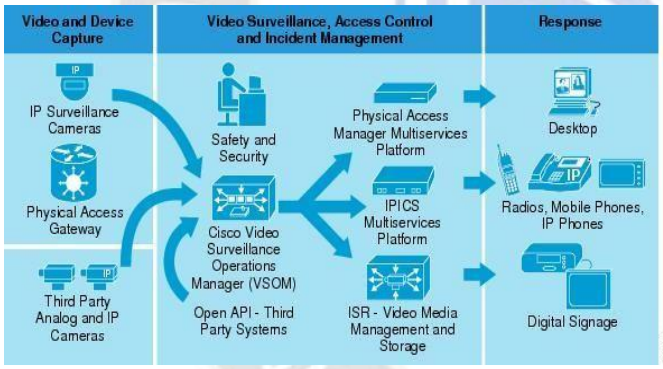


Fig -1: Architecture of video surveillance system

The perks are higher speed video acquisition system and stores the video clips and drawbacks can be function are not handled accordingly.

An algorithm of query is used which will be used to bridge the relationship between database and query video by a graph, it builds a sub graph which maps the max size and it leave the one found small. Here two systems are used mainly:

Video frame Detection
Video Similarity Search

This application system captures video and shares to connected systems, also alerts the person who is controlling by messaging alarm as required [7, 8].

As a result this system provides more stability with more smartness , more features, future extension , less costly , high durability that can be used in anywhere like in home , shop especially in crowded areas like traffic signal, malls , etc., with less than tenth potion of power consumption.

A Real time operating system i.e. RT Linux is used and it can be used with wired or wireless internet connection, this is its advantage. It gives a alerts message to the person[9].

It can receive client's request like monitoring and controlling. Some of its pros are low maintenance cost, budget friendly and can be operated through mobile i.e. it can operated from anyplace and also on the mobile phones or on the desktop as per convenience.

This paper explains the building process of USB camera how it drives in operation system and a video coding technology i.e., MPEG-4 and the video data transmission through network. The perks of this paper will be Rapid video capture, Real time transmission well, Stable performance and lower cost. The figure below shows the Structure of video capturing system[18]. The video capturing system is as depicted in Fig.2.

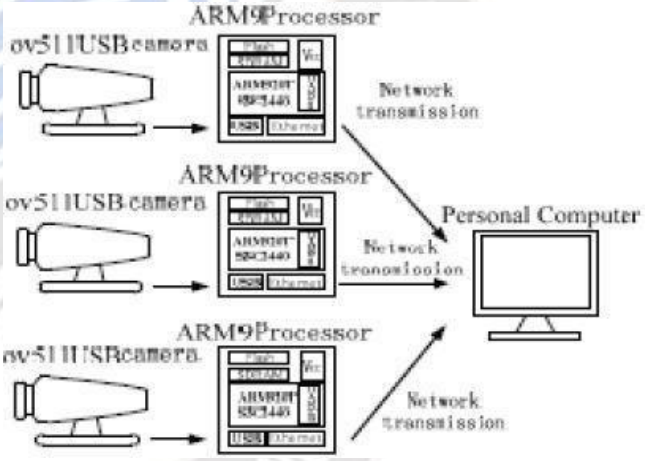


Fig -2: Video capturing system structure

OpenCV library is used here to capture camera video and recording activities using protocol. Once the recording done it can be seen after fetching from database, the video sends using server to client on its phone. User can then take appropriate action [12, 14].

In paper the video clip captures and message is sent. Video data is transferred to server and then it is received by client on their mobile phone. The pros of including of lesser modules is minimizing in prize, smart, stable and higher in security.

It utilizes at a time command to send the messages alarm and can start monitoring remotely. If there is no object present screen stays stable at a point and due to any cause if object is present and cause occurs screen blur. Blur screen can occurs due to internet fault or network connection

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failure. We use camera quality required to the environment [9].

2. PROPOSED ARCHITECTURE

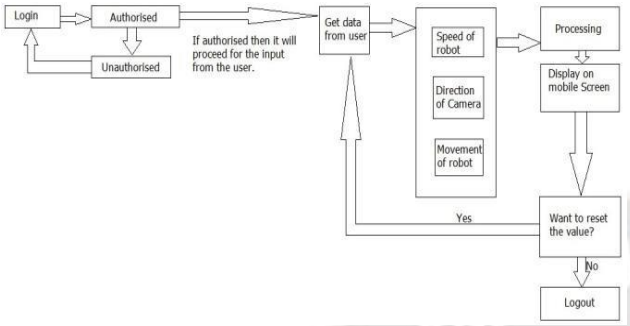

Fig -3: System Proposed Architecture

After login verification done on Linux operating system used, only verified and authorized user will continue for the input. If the user is not authorized due to unmatched entry or for any other reason than it will automatically directed to the login page [10]. The proposed system Architecture is as shown in fig.3.

User can control rotation of camera through their devices only by clicking on buttons provided in application and have some other features like he/she can see live and previous videos too if want to check, the direction that are permitted to move are left, right, up and down. The LED below camera supports to record clear in low light.

The recorded chips from the camera are displayed on screen of mobile or on the desktop, wherever the client wants to see. The user can request even deleted data from server as it is being stored as backup for all clients for long time period as per services adopted by client [13,17].

3. CONCLUSION

In the end we conclude that every person wants to be in a world full of security, this paper has covered most of the essentials that are extremely useful in application building. As we concern of security, this is secure and financially low to adopt. In future with use of most advance technology we can make it fully wire free and extend range over far distance. This was the detailed description that includes equipment, assembling, designing, implementing and deploying.

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