

SURVEILLANCE AUTOMATON

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ABSTRACT

This paper deals with the survey of Smart surveillance monitoring system using Raspberry pi. Surveillance is important as far as security is concerned these days. Commercial spaces, schools and hospitals, warehouses and other challenging indoor and outdoor environments require high end cameras. The current technologies require RFIDs which are costly and hence the security domain in all becomes expensive and hence there was a need to work on this. This paper describes the use of low cost single on board computer Raspberry Pi. This new technology is less expensive and in this project it is used as a standalone platform for image processing. It increases the usage of mobile technology to provide essential security to our homes and for other control applications. The proposed home security system captures information with database and fetch details about student and push the notification through mail.

Keywords- *Raspberry Pi, Security, RFID.*

1. INTRODUCTION

Fast development in the technology has increased the risk of intrusion. Using security cameras allows a person to monitor his property. The majority of organization and administrations are making use of such security cameras with the intention to save their business as well as property from terrorists and illegal entry. Nowadays, the security cameras have become much more advanced, reasonable, smaller and straight forward.

1.1 WHY SMART SURVEILLANCE?

In our busy life we don't have much time to monitor and to keep a watch on everything. From every family most of the members are working, or even in malls and hospital to monitor each and every space is not possible. It's 21st century and we need to think smartly to make our life better, easier and secure, so instead of sitting at once place for longer why not carry the security in our pocket.

1.2 BENEFITS OF SURVEILLANCE

1. Availability- There was a time when the surveillance techniques were utilized only in shopping centers and malls. Now-a-days, you can notice closed-circuit televisions almost at any place you visit, from a small store to homes and holy places. As a result, they guarantee greater public security at a fraction of the cost.
2. Real-time monitoring- Traditionally big organizations have always had the benefits of video surveillance manned by security professionals. In the past times, the capturing and transmission used to take time. But, modern technologies let users to check and reply to alarms immediately.

2. LITERATURE SURVEY

In [1] earlier system has many problem such as such as high cost, low intelligence, poor stability, weak security. In order to solve these problems, S3C2440 microprocessor is adopted in this embedded video acquisition system, which combing with the Linux operating system. Video capture is realized by the Video 4 Linux [1]. This paper has advantages such as higher intelligence, higher stability, and easy installation and

disadvantage as it requires high cost and continues GSM network is required to send message, if the network is not available this project may not work properly. Below is the diagram showing the flowchart of Video4Linux that has been used in this paper.

In [2] the design and implementation of a video surveillance system based on 3G wireless mobile Internet access is proposed. A database in the video control server to automatically store the selected frames of the video stream data is implemented. A high-speed video monitoring sub-system using 802.11 in our surveillance system is also realized.

In [3] a query algorithm is introduced which will be used to establish the relationship between query and database video by bipartite graph, it construct a sub graph which matches the max size and it neglects the small one. Here two system are mainly used:

- Video frame Detection
- Video Similarity Search

Deep packet capture (DPC) is the act of capturing complete network packets crossing a network. Here we capture data packets in the scalable network using packet capturing tools.

In [4] Network video capture system using friendly ARM9 board support package (BSP) S3C2440 is presented. This application system captures video, shares among networked systems and also alerts the controlling person with short message service alarm as required by the client. This system works in a real time environment and is supported by embedded RT Linux. This system provides low cost and high effective intelligent monitoring system like in elevators, home security systems etc. with low power consumption. [4]. Here RT Linux is used i.e. Real time operating system and also it can be wired or wireless internet access this could be its advantage. It alerts the person through the Short message service (SMS).

The [5] paper deals with the integrated server and MPEG video [5]. The integrated server means that a specific server is located in the centre of the surveillance system this can get the video information from the network camera and then compress that video and can also store that video for future reference. It can also receive request from the clients like monitoring, controlling etc. The method used in this paper is the open PLANET technology that has been developed by Shikoku Electric Power Company Ltd it has some excellent characteristics, one of which is to transmit digital information from node to node through electric power line. [5]Its advantages include low maintenance, cost effective and mobile operation i.e. it can operated from anywhere and also on the mobile phones or on the desktop as per the user convenience.

The [6] paper elaborates the development process of ov511 USB camera driving in Linux operation system and the MPEG-4 video Coding technology and the network transmission realization of video data transmission. This paper uses ov511 USB camera to capture video and embedded Linux platform which is based on S3C2440 micro controls chip. The processing of the captured video is based on video4linux. Below shows the diagram the Structure of video capturing system. The advantages of this paper will be Rapid video acquisition, Real time transmission well, Stable performance and lower cost.

In [7] here First, USB camera video data are collected by the embedded Linux system, processed, compressed and transferred by the processing chip. Then, video data are sent to the monitor client by wireless network. Here the video is captured by the web camera and the information is processed and the video received is compressed.

In [8] next paper referred in the reference paper idea is to set up a computer terminal equipped with a GSM Modem at banks, which can be used to transmit/receive video/photos and/or commands to and from the administrator/owner. It uses Opencv library to capture camera images and detect intrusion using image comparison technique (Euclidean Distance Method). Once the comparison is done and an intrusion is found, it sends the streamed video from server to remote administrator over android phone. Admin can then take appropriate action and alert local security.

In paper [9] the video captures the motion is detected and SMS is sent. Video4Linux is used here to get the video data then is it transferred to the web server and displayed on the client side. The advantages of includes fewer modules, low cost, higher intelligence, higher stability and higher security. It utilizes the AT commands to give the SMS alarm and can realize remote monitoring. In this when the object is not there the screen shows green colour and when the object come and the screen is interrupts with any different object it shows red colour on the screen.

3. COMPONENT REQUIREMENTS

HARDWARE:

- RaspberryPi
- PiCamera
- mBot

SOFTWARE:

- Thonny IDE
- Raspbian OS
- Makeblock

PROGRAMMING LANGUAGE:

- Python

4. OBJECTIVE OF THE PROJECT

- To study the literature about public surveillance camera and understand the underlying process.
- To analyse the information gathered in literature chapter and come up with the final requirement for the system.
- To design and implement the bot to enforce the monitor using face recognizing.
- To test the bot and the system.

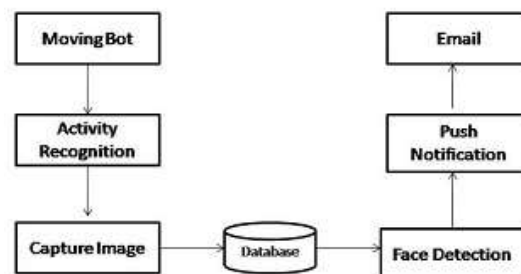


Figure 1 Architecture Diagram

4.1 PROPOSED SYSTEM

The main aim of this project is the utilization of Raspberrypi to depict a security alert framework utilizing low processing power chips utilizing Internet of things which screens and get alerts when movement is identified and sends photographs and recordings to a cloud server.

Moreover, Internet of things based application can be utilized remotely to see the movement and get warnings when movement is identified. The photographs are sent straight forward to a cloud server, sent as Gmail Notifications with snapshots and when the cloud is not accessible then the information is put away locally on the Raspberrypi and sent when the association resumes.

Accordingly, points of interest such these make this applications perfect for smart security surveillance monitoring where ever the security is a big concern and required security alert system with instant notifications such as in Industries, Banks, IT Offices and in Homes, this system can be best utilized. The whole report is

centered on the field of embedded system, Internet of Things and the use of Linux based OS to run applications on them.

4.2 BENEFITS OF PROPOSED SYSTEM

- In our system user will be able to view and operate even if he is at remote location i.e. user can operate it remotely.
- It provides real-time monitoring and hence the appropriate steps can be taken if any problem occurs.
- Our system can be used at various places such as hospitals, shopping malls, college or school premises, in house for keeping an eye on the children or the house objects.
- Since the system is moving it can capture a wide area and also it can be operated from anywhere if high range network is used.
- It is easy to operate and cost effective and like earlier days one will not be sitting on one place to monitor the video captured.

4.3 EXECUTION PROCESS

After giving the hardware and software connections as mentioned above, the process of implementation in this paper is discussed.

5. IMPLICATIONS OF SURVEILLANCE

Smart surveillance is a technology that has many different applications and potentially has significant implications to each of these. We look at implications primarily in the surveillance application, namely, security and privacy.

Security Implications: Clearly, the ability to provide real time alerts, capture high value video and provide sophisticated forensic video retrieval has the potential to enhance security in various public and private facilities. However, the value of the technology is yet to be proven in the field. As more and more smart surveillance systems get deployed the exact value will be known. In particular, systems must be analysed for their effectiveness in detecting events of interest, while generating few false alarms. In the first instance smart surveillance systems are intended to assist security guards, and will be measured on their ability to improve vigilance and to reduce labor and storage costs.

Privacy Implications: Smart surveillance systems have the ability to monitor video at a level which is humanly impossible. This provides the monitoring agencies with a significantly enhanced level of information about the people in the space leading to higher concerns about individual privacy and abuse of sensitive individual information. However, the same smart surveillance technology by virtue of indexing the video provides novel ways of enhancing privacy in video based systems which was hitherto not possible. Further details on the privacy preserving aspects of smart surveillance technologies.

6. CHALLENGES

There are two types of challenges that we highlight in the future development of smart surveillance systems.

1. **Technical Challenges :** There are a number of technical challenges that still need to be addressed in the underlying visual analysis technologies. These include challenges in robust object detection, tracking objects in crowded environments, challenges in tracking articulated bodies for activity understanding, combining biometric technologies like face recognition with surveillance to achieve situation awareness.
2. **Challenges in Performance Evaluation:** This is a very significant challenge in smart surveillance system. Evaluating performance of video analysis systems requires significant amounts of annotated data. Typically annotation is a very expensive and tedious process. Additionally, there can be significant errors in annotation. All of these issues make performance evaluation a significant challenge.

7. CONCLUSION

In the end we conclude that every person wants to be in a better and secure world, this survey paper has covered most of the algorithm and the advantages and disadvantages of every paper that has published so far and the work that has done over this project. To provide better security and safety new designs are implemented and also that are cost effective and to make it better further research is going on. In future we can make

everything wireless in this project and also better video quality which will be easy to operate and in a way the security information can be carried and viewed anywhere.

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