Live Video Streaming using Raspberry Pi with Face Detection

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Abstract:- **In today's world, surveillance systems like CCTV are extremely popular but they require high cost for installation and they are not much flexible and scalable. Live Video Broadcasting Like Television is also a far complex and high cost process for video streaming. On the other hand, our proposed system of live video streaming using raspberry pi through cloud server are far more simple and low cost with high level of accessibility through internet. This system gives both flexibility in terms of architectural changes and scalability in terms of increase of users to access the video streaming..**

Keywords: *Raspberry PI, Video Streaming, Face Detection.*

I. INTRODUCTION

The Raspberry Pi is an embedded machine which can function as a small sized computer having all the components of a general purpose computer but in much lesser capacity. It is capable of doing almost all functionalities and applications performed by a general purpose computer like image processing, connecting over internet, etc.

As Raspberry Pi has so many applications and can be used for performing majority of operations which can be done through a general purpose pc, we can also use raspberry pi for live video streaming. Traditional Video Streaming Devices are bulky and are not much compatible for integrating with other systems. But a Raspberry Pi are portable and light weight and can be easily integrated with other systems by connecting via internet.

A 4G,LTE carrier or WIFI network if available can be interfaced with Raspberry Pi, to directly stream the video captured by raspberry pi to the cloud server. A high definition camera interfaced to Raspberry Pi to capture real time video. All the processing required for capturing the video from camera and transferring it to cloud server in real time is done by raspberry pi. Motion detection algorithm can be used to capture video efficiently only when there is movement detected in video.

On Cloud Server Side, live video stream will be received from raspberry directly. Here we can apply face detection algorithm. As processing power of servers are usually large we can apply face detection algorithm on the video stored in server side .From cloud server we can send video streaming to a browser where user can see live video streaming captured by raspberry pi device.
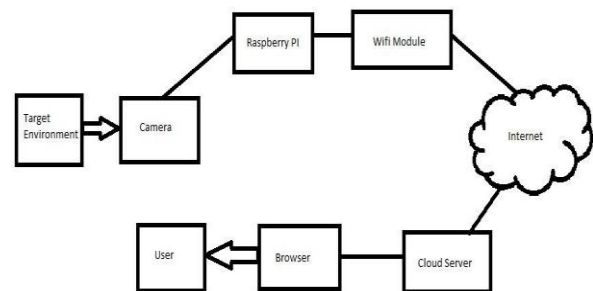
Cloud Side platform can be aws and technology can be PHP. Implementation of motion detection algorithm will be done in Raspberry PI using Python Programming. Pi

Camera Module can be used for capturing video through raspberry pi. It can be easily integrated with Raspberry Pi.Wifi can be integrated with Raspberry Pi 3 as it has inbuilt support for wifi connectivity.So as internet connectivity is available for raspberry pi we can send live video streaming data through http over internet

II. MATERIALS AND METHOD

In our proposed system , we have elements as shown in the figure. Different elements in the block diagram are

1. Camera
2. Raspberry PI
3. Wifi Module
4. Internet
5. Cloud Server
6. Browser

1. Camera
Camera is interfaced to Raspberry PI. A high definition camera is used to capture good quality video which is transfers the video in digital format to raspberry pi.PI camera can be used as camera.

2. Raspberry PI
Raspberry PI 3 will be used for all the processing such as video capturing using motion detection, storing video stream temporarily and transferring video stream to cloud server by connecting to wifi and transferring stream via internet.

3. Wifi Module
This module is used for connecting raspberry pi to internet. This wifi module can be inbuilt or can be a separate module which can interfaced to raspberry pi.
4. Internet
Internet is used for transferring the video stream data from raspberry pi to cloud server.

5.   Cloud Server

We can use any cloud server provider like AWS(Amazon Web Services) or Digital ocean.

We can host our server side script along with database if required in the cloud server.The server side script like php will receive the video stream from raspberry pi via internet and will store it on cloud server

6.   Browser

A Browser is an application on any computer which is used to access any site on the internet.We can enter url in browser of our cloud server which hosts video streaming and user can can see live video streaming captured by raspberry pi in the browser of their pc.

A. Software Requirement
● Python
● PHP on server side
● Website development languages such as HTML,CSS and javascript

B. Application

Video streaming can be viewed through any browser by capturing video through raspberry pi and transferring it to cloud server and then user browser. Face detection can also be applied to capture videos for further applications like identification, surveillance,etc

III.   RESULT AND DISCUSSION

Proposed system for live video streaming and surveillance using raspberry provide both flexibility and scalability. Flexibility in terms of integration of advanced video processing technique such face detection in video footage .Architectural changes can also be done to enhance system in terms of its efficiency with low cost. Scalability in terms of live video streaming accessible to muliplte viewers I.e a decentralized system to view live video surveillance. As the streaming is hosted on a cloud server any one can view the streaming by reaching the url provided by cloud server. As today's internet accessibility is far more widespread , many viewers can view the live video streaming through their respective devices.

IV.   CONCLUSION

Today's live streaming and surveillance technique are lacking in terms of scalability and flexibility to integrate more advanced functionality into them.
Moreover they are very high cost and their installation is quite difficult.Live video streaming and surveillance gives us many advantages over conventional technique. We can improve scalability by providing access to video streaming over interne through cloud servers. We can add more functionality like face detection and motion capturing to enhance user experience. This are low cost solution with low level of difficulty in terms of installation

V.   ACKNOWLEDGEMENT

VI.   REFEREENCES

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