Raspberry Pi CCTV and Saving of Video

Course : EL-213

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Introduction :

Abstract :
This project implements the Raspberry Pi CCTV surveillance system with the additional feature of Saving the Video in a read/write -able format.The camera module utilised in this project is manufactured and distributed by Raspberry Pi Foundation connected to the Raspberry Pi

Board. The WiFi USB Adapter is attached to this system for the wireless transmission of data from the CCTV to the shared memory folder for remote monitoring purpose.
Purpose behind this project :

Raspberry Pi CCTV with the integration of Raspberry Pi Camera Module is a very economically viable and true to it's standard, surveillance system which can easily replace the bulky CCTV surveillance systems which costs high.

Raspberry Pi can be widely customised and is thus very flexible. From HD surveillance to motion-detect features, the system is light in hardware and can be made undetectable without lowering its power which gives high security and safety by providing video streams from the camera.

Raspberry Pi with the Raspbian Operating System helps in building the CCTV system in a user friendly process. The wireless video storage capability using the WiFi USB Adapter appends to the benefit of saving the video from the Camera to any memory storage disk or SD cards which makes it highly portable. The video saving capability helps the user to keep a check on the property as well as help him take precautions by analysing the data.

Literature Survey :

Current generation GPUs are really powerful, with lots of stream processors, fast memory and in some cases hardware video decoding support. Their prices are low and support multiple high resolution outputs. That makes them ideal for CCTV rendering. Traditional CCTV systems are based on a stack of decoder cards with analog outputs. These systems are expensive and hard to install due to its physical connections. We can replace such a system with a PC with a good GPU card. This system presents some advantages over the analog solution: it can use an existing network installation, can show any source that the PC can receive (HTML, VNC, Capturers, etc), can mix analog and IP cameras and the GPU shader capabilities permits apply complex filters to the video. Raspberry Pi Boards make it feasible to develop such video surveillance system along with the Raspberry Pi Camera Module and wireless USB adapter.

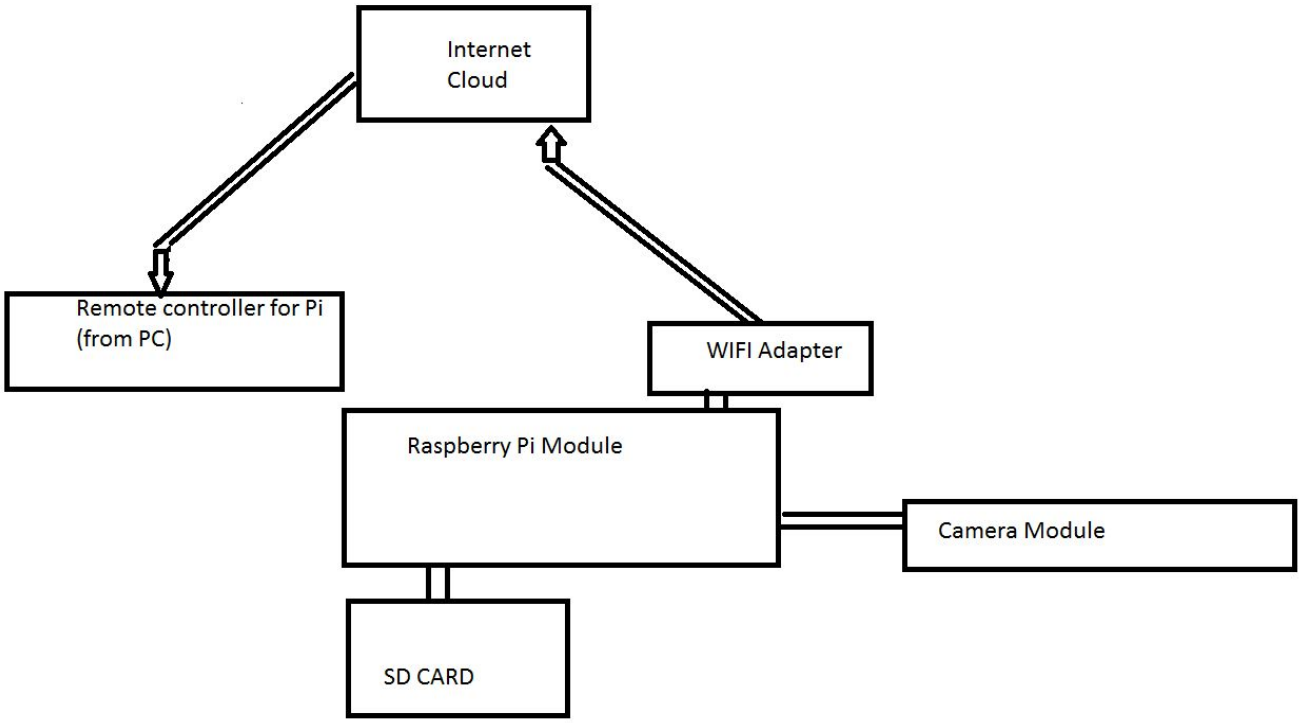
Implementation :

Components :

Raspberry Pi Model B
Raspberry Pi Camera Module
Wireless USB Adapter
SD Card

There are three main functional components in this project . They are the Camera, Wireless USB Adapter and the Raspberry Pi Board. The Raspberry Pi holds all the components at a place and helps to keep the system intact and also checks the proper working of it's components. The Camera will be used for the primary capturing of the location and the adapter for the transfer of data from the Camera to the destination folder where the videos will be saved. The user will also be able to configure the system to his/her own need, if needed.The hardware storage device(SD card) is used to save the video recorded by the camera module.

Block Diagram :



Outcome :

We can install the Raspberry Pi CCTV in any facility such as school, home, industrial areas, etc and can be modified to any specific preference. The video storage capacity can be increased to any amount without affecting the system. The Raspberry Pi Board is programmed to use the Camera Module to record the locale and to save the video. The user can watch the saved footages anytime later. This project aims to develop Raspberry Pi CCTV to record the movements of any suspicious or harmful acts.

It can also be mounted for Baby Safety Monitors to keep the infants safe from any harms.

References :

https://www.raspberrypi.org/products/camera-module/

https://www.raspberrypi.org/blog/turn-your-pi-into-a-low-cost-hd-surveillance-cam/

https://www.raspberrypi.org/documentation/configuration/wireless/wireless-cli.md