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A Real-Time Security System Mini-Rover

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Abstract: ***Now-a-days within the world there exists a security system that is mounted to one purpose, they can't move around. They are not controlled by the user. Moreover, to obtain/record the footage of varied view points from CCTV cameras becomes quite expensive. Once it's put in, there will be no scope of modification/upgrading the system. If tried conjointly the system becomes expensive and time overwhelming too. In order to beat all the drawbacks of CCTV cameras that are getting used these days, we want to develop a system that is termed as mini-rover. It will be remotely controlled by the user, can move around as per user direction and provides real time video footage. This footage is saved as information within the SD card which can be helpful within the future. The rover is controlled from automaton devices/Desktop/Laptop exploitation browser via internet/Wi-Fi. Only factor is that each the rover and device dominant the rover ought to connect with the same IP address.***

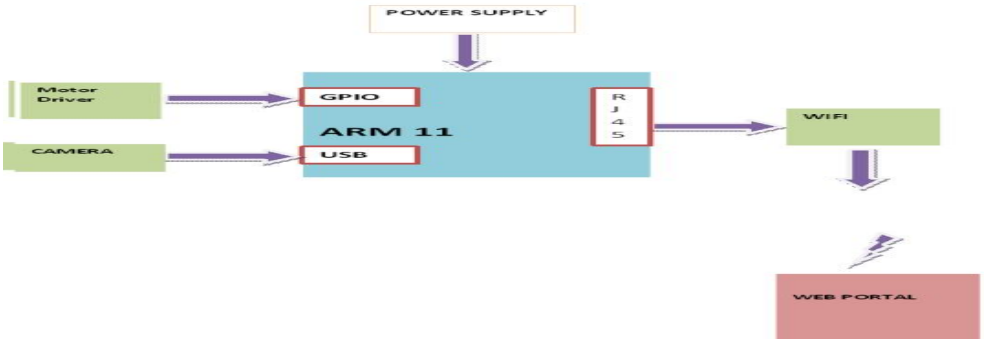
I. INTRODUCTION

In our modern-day to day life, security and surveillance plays a really crucial role. An efficient security and surveillance system will offer crucial early warnings just in case of any quite emergency. However, if the surveillance system is capable of roaming within the realm of surveillance, a lot of space of interest is ascertained with optimum range of surveillance instrumentation beneath forced budget furthermore, if the surveillance system is well modifiable with varied sensors (digital temperature/ humidity/ flame/sonic/ air quality/ gas sensors, etc.), getting necessary knowledge becomes a lot of easier. This accessibility {of numerous/ of varied/of assorted} forms of necessary knowledge successively helps North American nation in deciding} process whereas managing various styles of things. According to Kevin Sir Frederick Ashton in [1], loss, waste and value management would be lots easier if we have a tendency to had computers with data on everything that we tend to use were responsible of investigation and pursuit things with none intervention from any human. RFID technology would modify computers with those forms of powers while not the constraints of human-entered knowledge therefore replacement, repairing or recalling faulty things would be lots additional convenient.

II. PROPOSED SYSTEM

In projected system, we tend to develop a straightforward video surveillance mini rover system which may be remotely controlled to maneuver around and supply the user with real-time video footage of a vicinity of interest. However, the project is enforced and represented using a Raspberry Pi based rover, controlled from smart devices using browser via WLAN/ web. But, in line with the system summary given, the user will access the rover control , video feed webpage running on the webserver hosted on the Raspberry Pi. However, the user agent (smart devices) needs to be connected to identical Wi-Fi network wherever the Raspberry Pi is connected or needs to connect with the web through a similar subnet utilized by the Raspberry Pi. In distinction to our Mini-rover will be controlled either from a Laptop/ Desktop/ android devices using our JAVA or Android-JAVA application either via a Wi-Fi local area network in native areas can ought to have a Dynamic IP address.

A. Block Diagram



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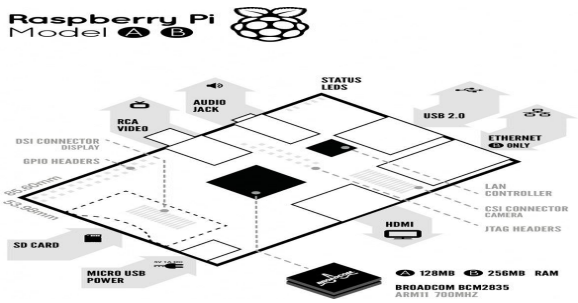
III. HARDWARE IMPLEMENTATION

A. Raspberry Pi

The Raspberry Pi is a single-board ,looks like a size of a credit card,developed by the Raspberry Pi Foundation,of UK ,with an intention to teach basics of computing in the institutes. The Raspberry Pi is factory-made in 2 board configurations through authorized producing deals with Newark element14 , RS elements and Egoman.Raspberry Pi boards are sold through online by the corporations .Egoman produces a version entirely in China and Taiwan, which might be distinguished from different Pi's . The hardware is same across all makers. The Raspberry Pi consists of a SOC,Broadcom BCM2835 , ARM1176JZF-S is incorporated on it and has 700 MHz processor, Video Core IV GPU, and was originally shipped with 256MB of RAM, later upgraded to 512 MB. It doesn't embrace a inbuilt hard disc or solid-state drive, however uses an SD card for booting and protracted storage.



The Foundation provides Debian and Arch Linux ARM distributions for transfer. Tools are accessible for Python because the main programming language, with support for BBC BASIC (via the RISC OS image or the brandy Basic clone for Linux), C, Java and Perl.**B.**

B. Wi-Fi Router

Wireless router is an device that works as a router — which means it sends information from the net cable to a tool — and as a wireless access purpose thus this information are often shared through radio signals rather than another cable. moreover as having the ability to produce wireless access to the net and different services on smartphones, tablets and PCs, you'll be able to use your router to form calls over the net, saving on expensive phone bills. you'll be able to additionally use it to access digital TV, exploitation product like Apple TV, Amazon's Firestick, Google's Chromecast or a sensible TV.

C. UVC Driver Camera:

A UVC (or Universal Video Class) driver is a USB-category driver. A driver permits a tool, like your webcam, to speak together with your computer's OS. And USB (or Universal Serial Bus) could be a common form of connection that enables for high-speed information transfer. Most current operative systems support UVC. though UVC could be a comparatively new format, it's quickly changing into common.

There are 2 forms of webcam drivers:

1) The one enclosed with the installation disc that came along with your product. For your webcam to figure properly, this driver needs a while to put in. it's specifically tuned for your webcam, designed by your webcam manufacturer and optimized for webcam performance.
2) *A UVC Driver:* You will solely use one driver at a time, however either one can enable you to use your webcam with varied applications.

The following Logitech webcams support UVC: Logitech® QuickCam® pro 9000 for Business, Logitech® QuickCam® pro for Notebooks Business, Logitech® QuickCam® Communicate MP for Business, Logitech® QuickCam® Deluxe for Notebooks Business, Logitech® QuickCam® 3000 for Business.

IV. SOFTWAREREQUIREMENTS

A. *Linux Operating System*

Linux or GNU/Linux is a free and open source software package OS for computers. The OS could be a assortment of the fundamental instructions that tell the electronic components of the pc what to do and the way to figure. Free and open source software package (FOSS) implies that everybody has the liberty to use it, see however it works, and changes it. there's lots of software package for Linux, and since Linux is free software package it implies that none of the software package can place any license restrictions on users. This is one amongst the explanations why many of us prefer to use Linux.

A Linux-based system could be a standard Unix-like OS. It derives a lot of of its basic style from principles established in UNIX throughout the Nineteen Seventies and Eighties. Such a system uses a monolithic kernel, the Linux kernel, that handles method management, networking, and peripheral and file system access. Device drivers are either integrated directly with the kernel or added as modules loaded whereas the system is running.

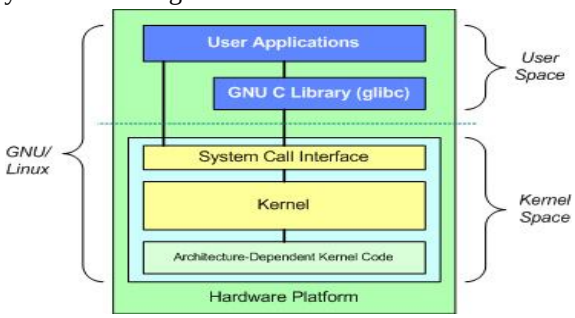


Fig: Architecture of Linux Operating System

B. *Qt for Embedded Linux*

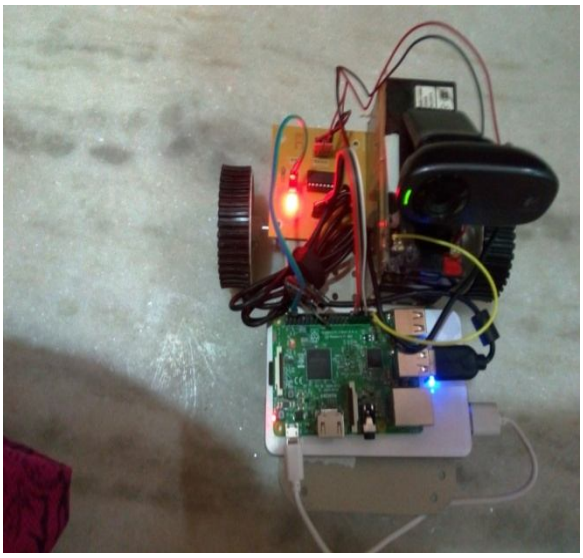
For GUI(Graphical User Interface)application Qt is used.Qt is one of the frameworks, and also useful for developing non-GUI programs such as command-line tools and consoles for servers. Qt uses standard C++ however makes intensive use of a special code generator (called the Meta Object Compiler, or moc) beside many macros to complement the language.Using language bindings Qt is employed in many other programming languages It runs on the most important desktop platforms and a few of the mobile platforms. Non-GUI options include SQL database access, XML parsing; thread management, network support, and a unified cross-platform application programming interface for file handling.

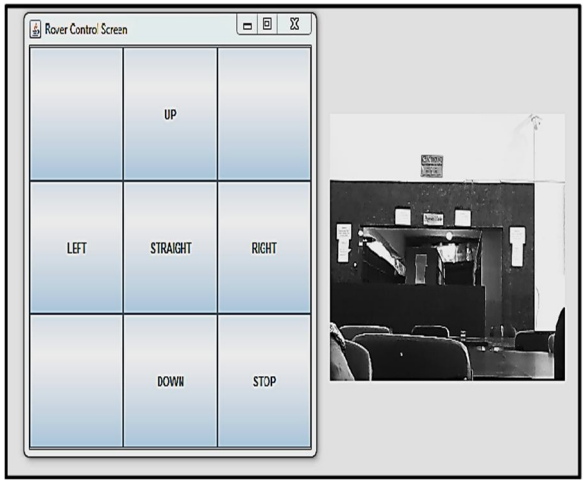
C. *Open CV*

1) Open CV (Open source computer Vision) consists of set of library functions for programming, for real time computer vision. it's developed by Willow Garage, that is additionally the organization behind the illustrious robot OS (ROS). currently you'd say MATLAB can also do Image processing, then why open CV? declared below are some variations between each. Once you undergo them, you'll be able to decide for yourself. benefits of OpenCV over

2) *MATLAB (Collected from Varied Blogs/Forums):*
3) *Speed: Matlab is made on Java, and Java is made upon C. Therefore once you run a Matlab program, your computer is busy making an attempt to interpret all that Matlab code. Then the code is decoded into Java, and then only the final code is executed. Whereas,an Open CV consists a library functions written in C/C++. you're nearer to directly offer machine language code to the computer to induce executed. therefore ultimately you get additional image processing done for your computers processing cycles, and no more interpreting. As a results of this, programs written in Open CV run a lot of quicker than similar programs written in Matlab. So, conclusion? Open CV is damn quick once it involves speed of execution. as an example, we would write a tiny program to notice people's smiles during a sequence of video frames. In Matlab, we might usually get 3-4 frames analyzed per second. In Open CV, we would get a minimum of thirty frames per second, leading to real-time detection.*
4) *Resources Needed: Matlab uses lots of system resources,as it is of high level in nature.To run a video it requires over a GB of RAM.Whereas,an OpenCV requires approx 70MB of RAM.Cost: selling price for the bottom (no toolboxes) MATLAB (commercial, single user License) is around USD 2150. Open CV (BSD license) is free!*
5) *Portability: MATLAB and Open CV run well on Windows, Linux and mac OS. But an Open CV,can run on any device that runs C.*

V. RESULTS





VI. CONCLUSION

The project "A real-time security system mini-rover" has been with success designed and tested. it's been developed by desegregation options of all the hardware parts and code used. Presence of each module has been reasoned out and placed rigorously so contributory to the most effective operating of the unit. Secondly, mistreatment extremely advanced Raspberry pi board and with the help of growing technology the project has been successfully implemented.

VII. FUTURE SCOPE

This final section of the report outlines some features that would probably be enforced in future releases. the present set of options implement may be a minimum to what a client would expect. In future we are able to monitor the information or pictures on remote computer by accesing web. additionally we are able to maintain information on the board itself exploitation SQL lite

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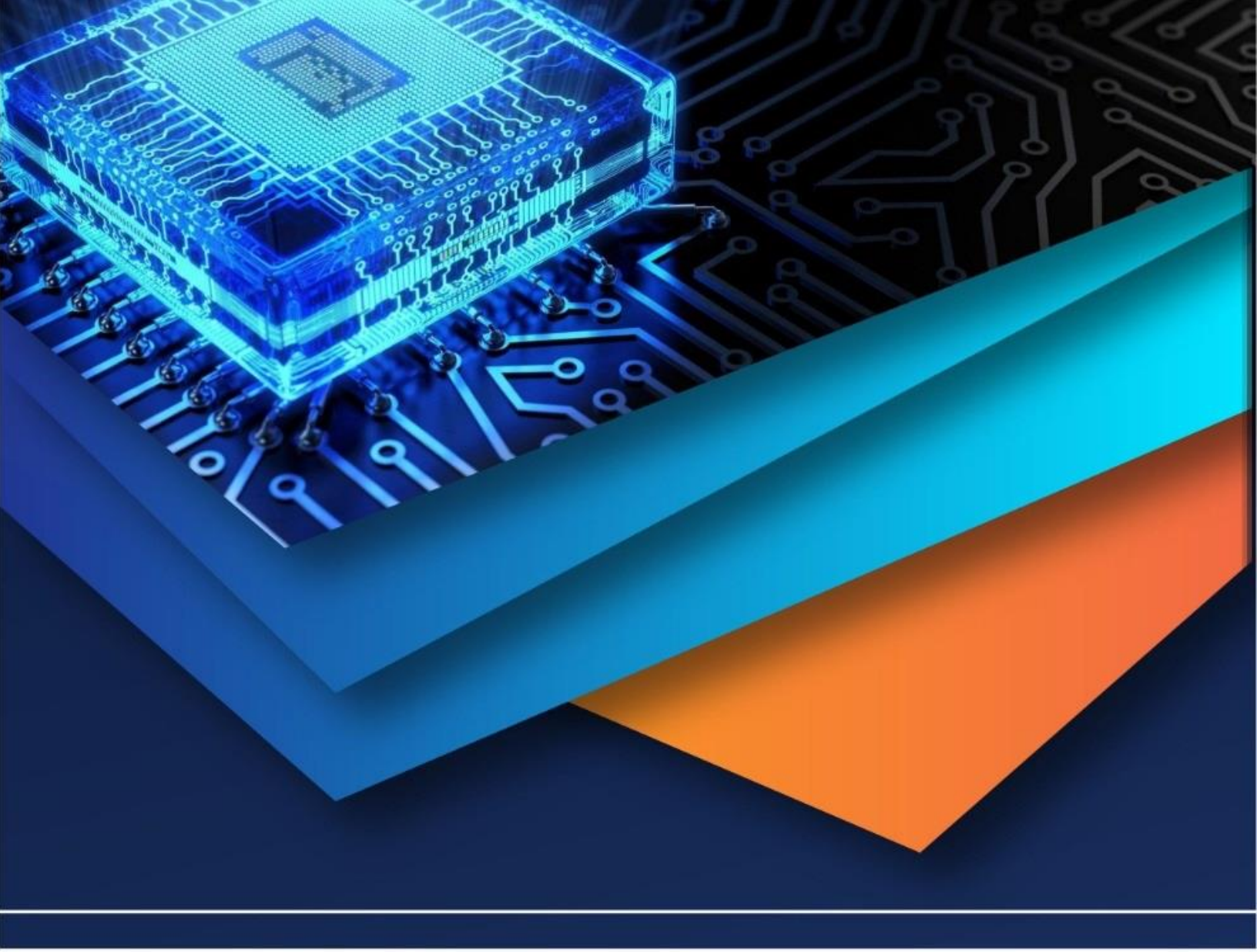

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