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Implementation of Multi- Environment Robot for Surveillance & Live Streaming on Linux Platform

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ABSTRACT:

Smart home environments have evolved to the point where everyday objects and devices at home can be networked to give the inhabitants new means to control them. Advances in digital electronics have enable the development of small in size and communicate in short distances sensor nodes. They are low-cost, low-power and multifunctional. The sensor nodes consist of sensing, data processing, and communication components, leverage the idea of Wireless Sensor Networks (WSN) based on collaborative effort of a large number of nodes. There are a large number of reseaches dealing with WSN applications, but it is still possible to explored in WSN development and maintenance. This paper examines the possibility of integration WSN and the service robots into a smart home application. The service robots can be considered to be mobile nodes that provide additional sensorial information, improve/repair the connectivity and collect information from wireless sensor nodes. On the other hand, the WSN can be considered as an extension of the sensorial capabilities of the robots and it can provide a smart environment for the service robots.

Keywords:

Raspberry Pi processor, DC motor, L293D driver, Camera module, robot.

I.INTRODUCTION:

Today each and every one is concerned about their security since the growth rate of crime has increased. This caused people to have started to consider the significance of surveillance systems. Majority of the people are doing IP based installations rather than the analogue because of it being accessible from anywhere. In order to make the IP-based systems affordable for the people having low budget we need to develop a system which is cost effective and portable. This project uses raspberry pi model 'B' for making this real time surveillance possible. The Pi has the capability of installing and processing high resource software's which makes it possible to accomplish the objectives of live streaming & controlling the robot.

II. RELATED WORK:

2.1 BLOCK DIAGRAM:

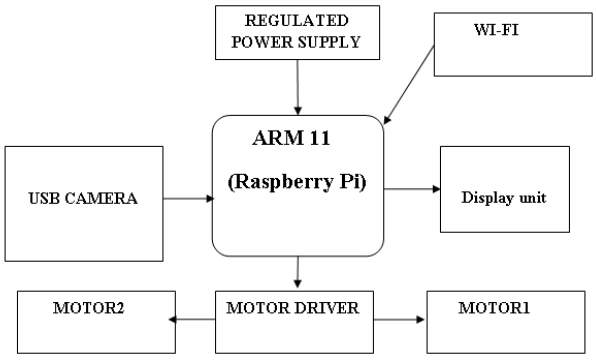

Figure-1: Block Diagram of project

2.2 EXISTING METHOD:

In the existing system the Lab monitoring system is design and controlled by using RF technology which can monitor and control the system inside the lab only in places where network availability is more.

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They are bit more costly because cost of components is increased. Not so easy to implement as you have to take great care of noise, Because of antennas it is bulkier.

2.3 PROPOSED METHOD:

The proposed method is used to overcome the drawbacks present in existing method. The controller transmits the data to remote PC through Ethernet by using FTP. Once data is placed at server we can view the data at remote PC (with internet) on web page with unique IP address. We can view continuous streaming of video as well as control the robot using wireless communication. If we want to control the robot based on information of data we can control through web page from remote location using HTTP protocol. HTTP protocol continuously requests the server for control (turn on or turn off) the devices. In this way we can monitor and control the devices through remote PC.

III. HARDWARE COMPONENTS:

3.1 RASPBERRY PI PROCESSOR:

Figure-2: Raspberry Pi diagram

The Raspberry Pi board involves a processor and snap shots chip, Random Access Memory (RAM) and more than a few interfaces and connectors for external devices. Some of these instruments are main others are optional. It operates in the identical method as a ordinary pc, requiring a keyboard for command entry, a show unit and a vigor give. considering that raspberry Pi board operates like pc it requires 'mass-storage', but a tough disk pressure of the variety observed in a ordinary pc is not relatively in maintaining with the miniature dimension of Raspberry Pi.

3.2 DC MOTOR:

In any electric motor, operation is based on simple electromagnetism. A current-carrying conductor generates a magnetic field; when this is then placed in an external magnetic field, it will experience a force proportional to the current in the conductor, and to the strength of the external magnetic field. As you are well aware of from playing with magnets as a kid, opposite (North and South) polarities attract, while like polarities (North and North, South and South) repel. The internal configuration of a DC motor is designed to harness the magnetic interaction between a current-carrying conductor and an external magnetic field to generate rotational motion.

3.3. CAMERA MODULE:

A UVC (or Universal Video Class) driver is a USB-category driver. A driver enables a device, such as your webcam, to communicate with your computer's operating system. And USB (or Universal Serial Bus) is a common type of connection that allows for high-speed data transfer. Devices that are equipped with a UVC driver, such as the Logitech Quick Cam Pro 9000 for Business, are capable of streaming video. In other words, with a UVC driver, you can simply plug your webcam into your computer and it'll be ready to use. It is the UVC driver that enables the webcam to be plug and play. A webcam with a UVC driver does not need any additional software to work.

IV. RESULTS:

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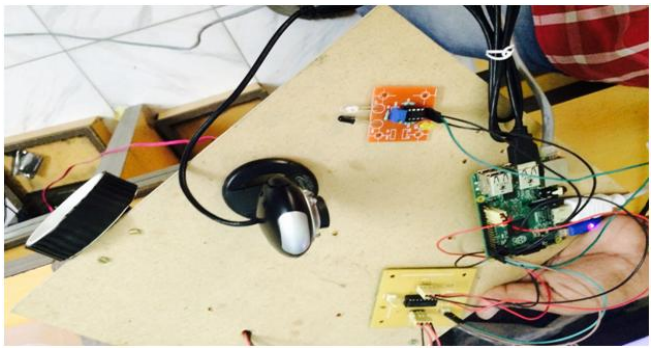

Figure-3: Pirobot of the project

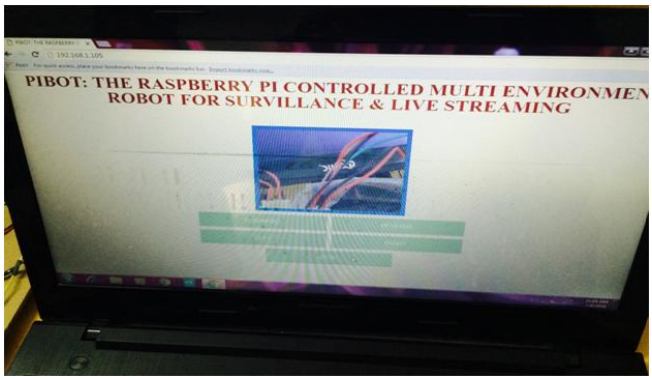

Figure-4: Wireless Video monitoring

V. CONCLUSION:

The project **"IMPLEMENTATION OF MULTI-ENVIRONMENT ROBOT FOR SURVEILLANCE & LIVE STREAMING ON LINUX PLATFORM"** has been successfully designed and tested. It has been developed by integrating features of all the hardware components and software used. Presence of every module has been reasoned out and placed carefully thus contributing to the best working of the unit. Secondly, using highly advanced ARM11 board and with the help of growing technology the project has been successfully implemented.

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