

Web based Monitoring and Controlling of Mobile Robot Through Raspberry PI Board

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Abstract— This paper presents the observing and controlling of mechanical movements through remote system by utilizing a web program and getting to a website page. A camera is mounted on the robot to show signs of improvement perceivability of the articles. The programming dialect of the robot depends on the LINUX stage which will be interfaced with Raspberry Pi board. The PIR sensor identifies a man or a question goes into an observation region and the smoke sensor distinguishes the fire mishaps by detecting the smoke level increment in the climate. The ULTRASONIC sensor provides precise, stable non- contact distance measurements from 2cm to 4 meters with very high accuracy. The yield of the sensors can be shown by means of caution to the client. This portable robot can be worked from wherever on the planet by utilizing web of things (IOT).

Key words-Raspberry Pi3; Mobile robot, PIR sensor, smoke sensor, Metal sensor, Ultrasonic sensor,L239D driver, DC gear motor, WI-FI, Web page.

I. INTRODUCTION

Apply autonomy is a craft of outlining, applying by utilizing robot in human attempts. A robot is a machine and is intended to play out a specific errand in view of the programming done by the client. Robot can perform multi assignment at once. In display days the greater part of the businesses are computerized. The advancement of robotization brings the robots into the ventures to play out the unsafe occupations that employment isn't possible by the human. The portable robot was completely controlled by the site page and the orders from the LINUX stage by means of RASPBERRY PI3 were gotten by the microcontroller. the framework is proposed with the assistance of minimal effort PIR sensor and smoke sensor to follow out the articles and to distinguish the fire mischances by utilizing Raspberry pi3.

Robotics is an art of designing applying by using robot in human endeavours. A robot is a machine which is designed to perform a particular task based on the programming done by the user. It can perform multi task at a time. Nowadays most of the industries are automated. The development of automation introduces the robots into the industries to perform the risky jobs which cannot be done by the human. The mobile robot was fully controlled by the webpage and the commands from the LINUX platform via RASPBERRY PI were received by the microcontroller. Here

The system is proposed with the help of low cost PIR sensor and smoke sensor to trace out the intruders and to detect the fire accidents by using Raspberry pi.

The Internet based mechanical framework is executed to control a robot lawnmower. The control should be possible by utilizing a pc based innovation. This robot is produced to associate with web through VB script, HTML and JAVA [1].

The reproduction is made through the MATLAB stage. The MATLAB utilizes the MRC calculation which has been converted into VHDL model and after that it is changed over as rationale entryway level through VLSI plan, execution [2].This sort of portable robot is actualized with speed control and position on different CCD camera and the sensors with fluffy identification technique and line discovery calculations are composed. The situating controller is utilized to watch not just on picture catching procedure calculation, because of this controller has been worked freely from speed and quick running utilizing chip based optical sensors which is mounted on the automated vehicle [3].This Robotic vehicle can be controlled by a straightforward Skype instant messages sent by the client. A web camera is remotely associated with the robot, and a video is caught and send back to the administrator using Skype video. This robot is associated with the pc by remote specialized strategy through two Xbee modules [4].This paper contains the data for controlling a mechanical vehicle development using web. The pictures sent by the mechanical vehicle to the client. This decides if the span of the picture is little or vast relying on the speed of the Raspberry pi [6].The controlling of the covert operative robot by sending vocal charges to it relies on the client. The voice correspondence is a most effective in human robot through communication among the media framework. This summon is utilized to control the automated arm developments and envision the region to give the control of the robot [7]. This paper acquainted an arrangement of robot with control using the DTMF tone created on crushing the keypad gets of a wireless by the customer. This ought to be conceivable by interfacing the convenient with web affiliation. It can prepared to control the robot reliably [8].The headway system for using UI is an AJAX organize, this UI is better when appeared differently in relation to the HTML shapes. The customer is the whole accountable for the start of the code to make the UI, which ought to be conceivable by getting a live video [9].UAV(unmanned Aerial vehicle)'s give their productive use in the fiasco places. The goal of these two individuals is to give control measure over taking huge amounts of soil in the riverved by

some unapproved gatherings. The framework gives characterized parameters for reconnaissance process by settling by means of points. UAV takes after target through focuses which are predefined. GPS is given in vehicle to locate the correct area of UAV. They likewise portrays the information interface between cameras locally available an unmanned aeronautical vehicle and the checking terminal[10]. Control of robot is finished by utilizing a pc, Android versatile or a tablet which is controlled by means of site and there will be the nearness of catches to control the developments of the robots. It can likewise be controlled by the hand signals system. A robot can play out the specific unsafe errands which is impossible by the client. The robots are utilized as a part of its particular fields of uses, for example, office, military, clinic, school and agrarian spots.

The webcam will catch live information in the environment and after that send it to a coveted gadget through web. The client will watch this information on the screen at the client end. As per the development, the client will control the wheel through the website page by utilizing Raspberry pi and Arduino controller. The info given to the site page is sent through the web and wanted development happens at the robot end. In the event of any camera blame happens, the entire procedure may progress toward becoming disappointment. This is the fundamental disadvantage of that kind of robot. And furthermore it requires more equipment segments to be interconnected.

II. PROPOSED METHOD

The development of Mobile robot with the assistance of projects a web association is set up between the automated vehicle and the client. This robot movement can be controlled by the page through Raspberry pi board. The robot catches the pictures utilizing a webcam and put away them into the memory. It catches and sent the live pictures utilizing web at a rate adequate to make them as like a live video to the human eye. By conquering the current procedure, the sensors are incorporated to build the proficiency of the task. In the event of any blame happens in the camera the PIR sensor distinguishes the protest movements and furthermore presenting a propelled eventual fate of Smoke sensor that identifies the smoke delivered amid flame mishaps and bomb impact. . The ULTRASONIC sensor gives exact, stable non-contact remove estimations from 2cm to 4 meters with high precision. This sensor transmits a ultrasonic wave and delivers a yield beat that compares to the required for the burst resound to come back to the sensor. Metal sensor can recognize metals without physical contact The LINUX working framework is utilized to diminish the equipment segments. The piece outline of proposed technique are given in Fig.1,

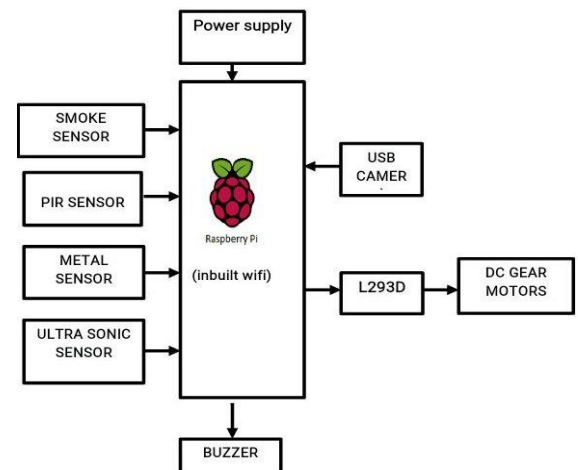


Fig.1 Proposed method Block Diagram

III. DESIGN AND IMPLEMENTATION

A. Raspberry Pi

Raspberry Pi3 model is Master card measured single board PC. This board is financially savvy when contrasted with a genuine PC, utilizes control rating of 5V, 700mA and it weighs not more than 50g. It is also available as Compute Module Development Kit, which is handy device for industrial applications and has more flexibility.

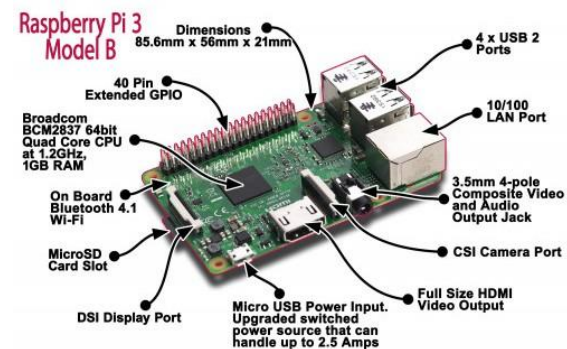


Fig. 2 Raspberry pi board diagram

It typically operates on ARM cortex A-53 processor at 1.2GHZ frequency with 1GB RAM. It runs the operating systems like Noobs, Raspbian etc. which is installed the SD card. It has 1 Camera connector to interface with the camera module. Accessories like Keyboard, Mouse and USB Wi-Fi dongle can be connected through 4 USB 2.0 ports. Ethernet connectivity through RJ45 port, 3.5mm Audio Port with low noise power supply can be linked up. It can be connected to LCD/LED monitor, Televisions and projectors to display the information through HDMI port. The sensors, switches and control of LED's are done by 40 GPIO pins. By all these embedded on a single board, Raspberry Pi isn't quite recently constrained to single utilize, it can be of wide use as indicated by the application.

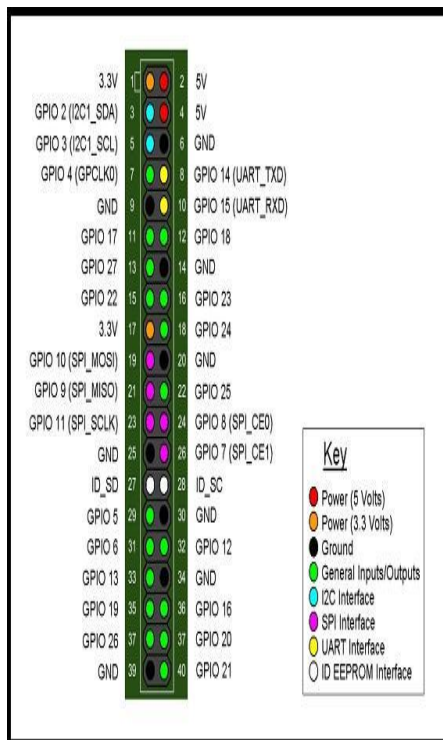


Fig 3.Pin diagram

Notwithstanding the natural USB, Ethernet and HDMI ports, the Raspberry-Pi offers bring down level interfaces proposed to associate all the more specifically with chips and subsystem modules. These GPIO (universally useful I/O) motions on the two x thirteen header pins incorporate SPI, I²C, serial UART, 3V3 and Five V control. These interfaces are not "fitting and play" and expect care to abstain from miswiring. The pins utilize 3V3 rationale level and they are not tolerant of five V levels. CSI (camera serial interface) can be utilized for associate the FIVE MP camera accessible. Not even programming empowered is the flex link connectors with DSI (show serial interface) and a serial connection inside the HDMI connector called CEC.

B.USB CAMERA:

A camera is an optical instrument that records pictures that can be put away specifically, transmitted to another area, or both. These pictures might be still photos or moving pictures, for example, recordings or films. The term camera originates from the word camera obscura (Latin for "dull chamber"), an early component for anticipating pictures. The advanced camera developed from the camera obscura. The working of the camera is fundamentally the same as the working of the human eye.



Fig.4 Diagram of USB Camera

C.L293D:

L293D is a double H-connect engine driver coordinated circuit (IC). Engine drivers go about as momentum enhancers since they take a low-flow control flag and give a higher-ebb and flow flag. This higher current flag is utilized to drive the engines.

D.DC motor

The engine driver circuit has fit for control the DC engines, which thusly control the developments of the automated vehicle. It has the voltage of around 5volt and current is around 600 milliampere.

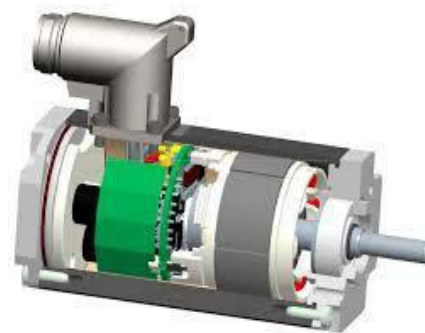


Fig.5 motor diagram

E. Sensors

In the event that if any default happens in the camera in future means the sensors can identify the question movements and give the data to the client. Latent Infrared sensor is utilized as a part of request to recognize the human or a question at the specific separation by detecting the radiation emitted from the items. They are regularly utilized as a part of robber cautions. At the point when a question before the foundation, for example, divider, it rise the room temperature to body temperature. Smoke sensor recognizes the fire mishap and bomb impact by detecting the smoke level in the air because of essence of CO₂, N₂, H₂, and so forth. It resembles a plate molded structure of around 100 milli meter(6inch) in distance across and 25millimeter(1inch) thin. Metal sensor detects the metals like gold and silver and Ultrasonic sensor detects the any objects.

IV. RESULTS



Fig.6 Diagram of Mobile Robot

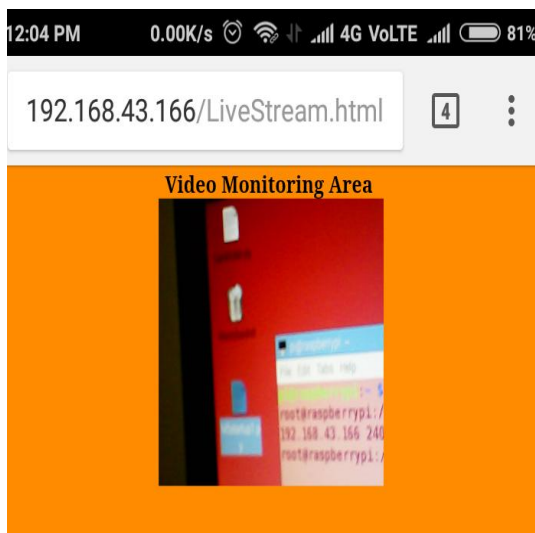


Fig.7 Video Monitoring Area screen shot

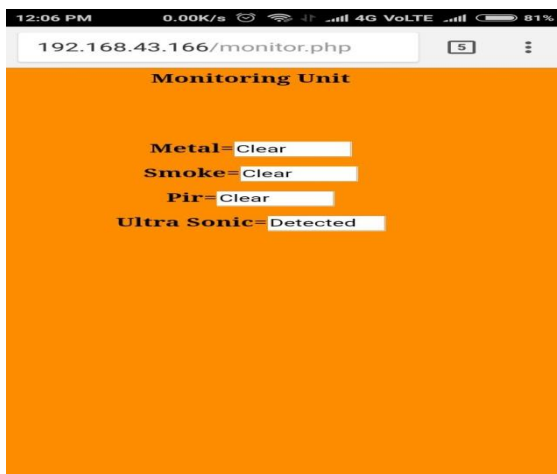


Fig.8 Ultrasonic sensor output screen shot



Fig.9 Metal sensor output screen shot

V. CONCLUSION

The observing and controlling of the portable robot by means of web utilizing Raspberry pi board using making the site page is done effectively. It needs just the Internet association which can be gotten by remote correspondence arrange. There is no hinder can be happened amid the orders to the robot from the client and the reaction from the robot to client. The robot can be effectively controlled through utilizing the PC or an advanced cell. By utilization of the web there will be a little time delay happens which relies upon the sort, speed and separation of the system. This portable robot can be

controlled by the client from wherever on the planet through Internet of Things (IOT).The website page made to control the mechanical developments is secured by the extraordinary client name and secret word which can't be hacked by anybody.

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