Smart Surveillance System – "Surveillance Robot "

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Abstract- *The digital video surveillance system is a surveillance system capable of capturing images and videos that can be sent over communication networks. Digital video surveillance systems can be used for nearly any environment. This project attempts to address the need for a affordable and easy controlled surveillance system. Currently, surveillance system require many costly components and a complicated installation process. The basic types of system currently available is a wired system. One drawback is that installation of a wired system can take a lot of time and money. Another drawback is that it is permanent. If the owner moves, the surveillance system must stay. The current surveillance system is fixed at certain angle or place because of that it can cover only certain area. The main drawback of current surveillance system is many blindspot remain in the environment of surveillance system.*

The purpose of the proposed system will be to eliminate the drawbacks of wired surveillance system. The proposed system will consist of a single unit which will monitor the environment in which it is currently working for various hazardous conditions and provide video feedback via web interface.

Keywords- IOT, CCTV , DTMF , NRF24LO1 , ARDUINO etc

I. INTRODUCTION

The present digital video surveillance system is CCTV. The present surveillance system is costly. Also it takes more time and money for installation purpose. The present system has many drawbacks as it can only cover specific area only, also it is fixed. It is non-movable. It is not affordable for small organization to maintain the system as it is very costly. So by deeply understanding the drawbacks of the current system we came to this idea "Surveillance robot".

A robot is electromagnetic device that is directed by some internal circuitry and computer coded program which makes it to perform by its own. So in this project we are making a robotic car based on mars rover model and we going to implement various sensors and device which will helps for surveillance purpose. The robotic car is based on the mars rover. Mars rover is a model which is capable of climbing stairs and also it can pass the obstacles easily.

This robotic car is operated through a RC controller which we made using the NRF24 module. Using the NRF24LO1 module we created RC receiver and transmitter which operates through radio frequency. The robot is easy to operate as the controller has joysticks to operate it. One camera is implemented on the robot for the video interface which can give you view through different angle. This system overcomes the drawback of blind-spot. This system is affordable and easy to implement also the components are easily available. The NRF24 wireless module provides good operating range. This robot can also be operated through mobile, for that purpose we are suing DTMF module. DTMF module simply convert the dial-tone frequency of mobile keypad into signal which is passed to the motor module, which operates the robot according to the signal.

II. PROBLEM STATEMENT

CCTV system is commonly used for surveillance purpose. A major disadvantage for CCTV cameras is that they can only monitor a limited area. Also the present surveillance system available in the market is very costly which is not affordable for some small scale industries or organization. The Surveillance Robot is a system that helps to overcome this disadvantages. This system is based on Internet of Things, which will create more convenient way of surveillance system.

Goals & Objective

a. This system aims to develop a smart surveillance system using Internet of Things, which simplifies the whole thing by giving control in your hand.

b. To create more convenient way of surveillance system.

c. To develop a system which overcomes the disadvantages of currently available system and build a system which is affordable to everyone.

d. This system aims to develop a smart surveillance system, which is easy to implement and handle.

III. LITERATURE REVIEW

W. K. Hawking and H. Robert, "Gesture control of mobile robot based arduino microcontroller"[1]. In the above

paper, Arduino Uno, Arduino Wi-Fi Shield are used for developing the system. In this mobile robot can operate through gestures using Arduino Microcontroller. These systems has simple approach for target detection. Also this system provide localization to control a distant robot mobile in real time.

S. Khan, Bashir Murtuza, A. K. Sehgal,"Controlling mobile robot using IMU and EMG sensor based gesture recognition"[2]. In this paper, The system is developed which control the mobile robot using IMU and EMG sensors. IMU and EMG sensors are used for gesture recognition. The robot is control through gesture. IMU and EMG sensors provide continuous recognition. The best feature of this system is user could control mobile robot using series of gestures.

Chang Su. Zing Un J. and J. S. Stoke, "Arduino based robot control using DTMF module"[3]. In [3], A system provide simple and effective way of controlling a robot using DTMF module. This system uses DTMF module and L293D motor driver for development of system. It operates through mobile. It takes input from the mobile and operates according to it. This system is simple to implement and it uses simple approach.

Petter Wane and John Wick, "A simple and effective way of controlling a robot by hand gesture"[4]. This system provide simple and effective way of controlling a robot using hand gesture. This system uses accelerometer, arduino, RF module, motor driver for development of system. This system uses basic components. Proposed system is simple to implement.

H. Watson, Dr. K. Ahmed and Zane R., "The design of hand gesture robot software based on wireless technology" [5]. This system uses wireless technology to control the robot using gestures. This system is based on wireless technology. AVR ATMega8 is used to provide wireless approach. Accelerometer is used to detect hand gestures.

Yashashree Dawale, Mansi Naik and Nikita Zarkar, "Control robot through wireless technology using NRF24 module" [6]. In the above paper, NRFL24L01 module is used with arduino pro and arduino nano to create transmitter and receiver for wireless signal transfer of joystick. The robot developed is operates through joystick. It is easy to operate. This system uses gyroscope, motor driver. Proposed system is simple to implement and it uses simple approach.

IV. PROPOSED SYSTEM

The proposed surveillance system overcomes the drawback of the current available surveillance system. The proposed system can be operated through two ways one is using RC transmitter and receiver which we build using NRF24L01 module and other way is using the DTMF module which uses L293D motor module to operate the robot. The following figure represent the schematic representation of the circuit. Fig [1] represents the schematic of RC transmitter which is made using the NRF24L01 module. Fig [2] represents the schematic of circuit of robot using DTMF module.

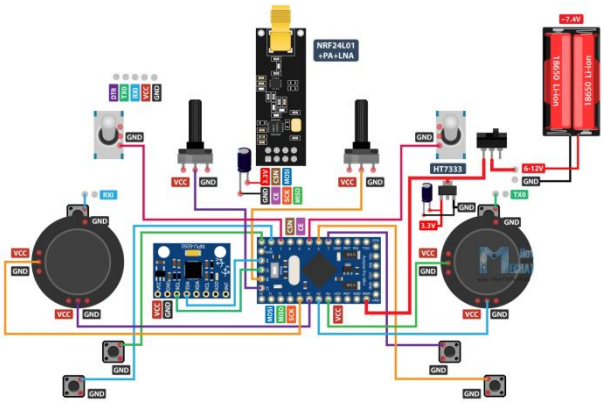

Fig 1. Schematic of RC Transmitter

In RC transmitter NRF24L01 module is used for wireless communication between transmitter and receiver. It transfer the signal to the receiver. MPU6050 accelerometer and gyroscope is used along with arduino pro. Joysticks are used to move the robot in any direction. It is easy to operate also it provide good operating range.

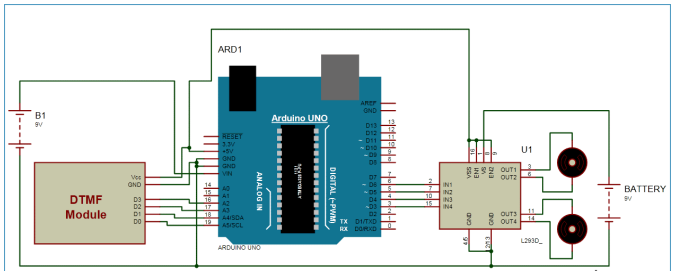

Fig 2. Circuit representation of the DTMF module interfacing with the arduino.

The above fig. represents the circuit connection of the robot using DTMF module. This is another way we implement to operate our robot. In this we used DTMF module, L293D motor driver and arduino uno3. This module operate on the frequency produce when we press the key on dial-pad of our mobile. DTMF module simply converts the analogue signals into digital signal, which is given to the motor driver which will operate on this signal and according to the signal robot moves. Also we have assemble camera and various sensors on the robotic car for the surveillance purpose. In proposed system user have all the control which is one of the best advantage

system provides. Our proposed system provides efficient way of surveillance system.

V. CONCLUSION

The surveillance robot will be designed to deliver a reasonable level of efficiency and simplicity, providing each user with a streamlined user experience. The surveillance robot is aimed at providing monitoring inclusive of vision, motion, fire, and carbon monoxide with limited setup. The surveillance robot can be customized to fuse seamlessly to any home, apartments or multi-dwelling units. Based on modular designs and complete scalability the surveillance robot is designed to be expandable and allow for future home control upgrades, thus enhancing the protection of your home as time and lifestyle change. This project is very useful in both security as well as surveillance field.

This project helps to overcome the drawbacks of current surveillance system. It provide affordable and easy to implement surveillance system.

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