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SURVEILLANCE ROBOT AND TWO AXIS ARM MECHANISM FOR ARMY OPERATIONS

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Abstract— This paper presents a practical present-time approach for surveillance robots at remote locations and enemy territories using a remote controller based robotic vehicle on wireless technology that can be used for defense and military applications. This is used for detection of bombs, since detecting bombs manually contains high risk. So, in order to save their lives this is used. The camera is used to detect and identify human, objects etc. This vehicle is designed to work in limited area with better efficiency for example In Armed forces. They can use these types of robot vehicles in hostage situations to determine the number of terrorists in the building, types of weapons used, bombs etc. It also contains a two axis arm to hold objects. The processing unit used in proposed system is Arduino working on Embedded C. The Arduino controls the movement, gather information from camera that is used to stream the real time video of surrounding to the operator

Keywords— IOT, Robot, Surveillance, Arm mechanism.

I. INTRODUCTION

Robot is a machine which is designed to do a particular task. It is based on program i.e. software and hardware. Nowadays industry is becoming modern and they use automated technology to perform risky jobs. Surveillance is a real time collection and analysis of data that timely distributes the information to the operator. Surveillance in Defense Applications plays an important role for keeping an eye out in order to protect its citizens and take necessary action as needed. As many people are getting bordered, because of which it might be risky to observe all the things at that place. So, in order to reduce the risk a robot is used which monitors continuously. This robot continuously watch and send live streaming of it to the authorized person. Because of that monitoring work will be somewhat easy and it will be accurate because of technology. By the video surveillance user can keep an eye on the live field. The system operates remotely by using web server and entire data will be stored on cloud and

only the authorized person can access the data whenever there is necessity.

Robots are usually small in size so they are enough capable to enter into tunnels, mines and small holes in building and also have capability to survive in harsh and difficult climatic conditions for life long time without causing any harm. This vehicle works within the range of the wifi. The system operates remotely by using web server and entire data will be stored on cloud and only the authorized person can access the data whenever there is necessity. This also contains a two axis arm in order to hold the objects and dissolve the bomb.

II. LITERATURE SURVEY

Till now from a detailed survey the robots are been controlled by using standard short distance RF waves which limits the capability, reduce the reliability and operational functionalities. The interfacing of sensors, camera module, Motor control and GPS is done with Raspberry pi for better processing control which provides better surveillance implementation in this system we obtain information about the area within 5m-10m by use of remote control, sensors and camera feed through wireless medium. This vehicle is designed to work in limited area with better efficiency for example in Armed forces. They can use these types of robot vehicles in hostage situations to determine the number of terrorists in the building, types of weapons used, bombs etc.

Most of the robots are used by charging the batteries as source of power. So, it becomes inconvenient to use this robot for long period. Existing robots use expensive video camera for live video streaming for manual control. This robotic vehicle with can widely be used as surveillance robot for security purpose and emergency rescue operations where human cannot enter.

The use of GSM modems ie, Global system for mobile communication is a time taking process since in this protocol

instructions to the robot are sent through messages in fixed time slots and it waits until the reply of the instruction and then goes to the next instruction. With this there will be more network delay and the power consumption is also more.

III. METHODOLOGY

PROPOSED SYSTEM

Using internet communication, a real time mobile robot system is built by interfacing the microcontroller i.e. Arduino by using a serial port. The microcontroller is programmed in Arduino C language. The mobile robot system contain camera moving in two axis arm robot to hold objects or to dissolve the bomb.

BLOCK DIAGRAM

The below figure is the block diagram to show detailed connections between the components.

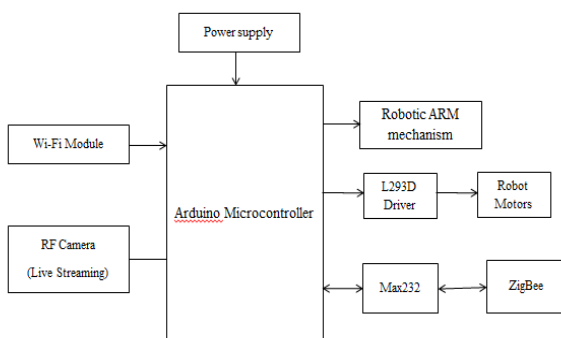


Figure:1 Block diagram

The power supply is given and then initialize the Arduino controller and load the HEX file then initialize the Wifi module by using IP address and port no. to establish network communication between hardware and PC. Zigbee module is connected with RS232 cables and the baud rate is selected as 9600. From webpage give commands for robotic direction control. From Zigbee serial window give commands for robotic arm movement control. The live streaming of data is observed on RF (radio frequency) live streaming page.

IV. RESULT

This robot is used for surveillance and the communication is done through zigbee transmitter and receiver. This will replace the human soldier in hostage situations. The arm mechanism can be used to pick, place, dissolve the bomb based on the situation.

V. FUTURE WORK

The robot can be able to travel to a longer distance using a wireless range extender which helps to increase the signal strength.

Based on the current pandemic situation, i.e. COVID-19, this robot can also be used in order to monitor the patients health condition without the contact of human being.

VI. CONCLUSION

In this we implement a smart surveillance robot for military application. With the help of this robot we know the real time condition of border area without using any human source. The surveillance robot gives us live streaming video according to that we give the command.

We can able to do video monitoring by using RF camera and also we are able to do live video surveillance for detecting harmful and dangerous objects like Bombs etc. By using zigbee Tx we can able to pick and place the harmful object and even diffuse the bomb if required.

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