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A Survey on IOT based Wireless Multifunctional Robot for Military Application

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ABSTRACT

This project is to make a robot which will be helpful for mankind. This robot will collect data from remote place and able to send those data to a remote IoT cloud database. This robot will be controlled via android mobile phone. We can control the movement of the robot by sending instructions via internet. The robot will receive the instruction wifi module and process the data with microcontroller. Then it will move the robot in all direction with the help of motor driver L298N by following the instructions received from android mobile phone. Then the robot will collect data of sensor from that place and send those data via Wi-Fi to the cloud database with the help of node MCU ESP8266. Then the data will be shown as well as the remote place can be monitored from anywhere in the globe from the internet server used. The system is made in very low cost.

Keywords: GPS, Metal Detection, Location, IoT, Ultrasonic Sensor, Microcode Applications.

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I. INTRODUCTION

Today, robotics is a rapidly growing field, as technological advances continue; researching, designing, and building new robots serve various practical purposes, whether domestically, commercially, or militarily. Robotics is a key technology in the modern world. Many robots do jobs that are hazardous to people such as defusing bombs, mines and exploring shipwrecks. Robotics' is the branch of mechanical engineering, electrical engineering and computer science that deals with the design, construction, operation, and application of robots, as well as computer systems for their control, sensory feedback, and information processing. Robotics can be defined as the science or study of the technology primarily associated with the design, fabrication, theory, and application of robots. While other fields contribute the mathematics, the techniques, and the components, robotics creates the magical end product.

Problem Statement:
To design a system which will control vehicle remotely, display updated GPS co-ordinates continually and will display other sensors data on terminal and also send data to cloud.

II. LITERATURE SURVEY

[1] IoT and Wireless Sensor Network based Autonomous Farming Robo
Year: 2020
Author Name:
Arsalan Khan, Sumair Aziz, Muhammad Umar Khan
Description:
By introducing mobility in some or all nodes in the wireless sensor network, system decreased the number of nodes and thus reducing the cost of the overall system. These mobile sensor nodes move in the environment without human intervention. nRF24L01 protocol is used for the reliable delivery of the sensor data. Digital Image processing is used to detect weeds and spray herbicides on them using Solenoid valve. The average accuracy of the system is about 93%. To make the robot autonomous, in this paper author used Ultrasonic sensors. Whole of the acquired data from the sensors is sent to internet using Internet of Things (IoT) technology by introducing Node MCU module in the system. The proposed system is fully autonomous but in coming

future this work can be elaborated by introducing a mobile application. Hence the robot can work autonomously or manually through mobile application, on user demand.

[2] An IoT based wireless robotic-hand actuation system for mimicking human hand movement
Year: 2020
Author Name:
Utkarsh Rai, Makarand Patil, Abhimanyu Pratap Singh, Dr. Wasim Arif
Description:
The robotic hand remote to the operand has almost congruent actuation to that of the operand. The latency involved is also minimal. This system can be used for further research in the medical and industrial setup where real-time, precise hand actuation is a necessity. The system in its current setup is tendon controlled which brings latency and imprecision in the movement of hand. The data transmission is done through MQTT which although has minimum latency, but is not applicable for applications where data security is an issue, a secure token based MQTT connection is more suited for these applications.

[3] IoT Based Smart Multi Application Surveillance Robot
Year: 2020
Author Name:
Aishwarya K Telkar, Prof.Baswaraj Gadgay
Description:
The robot model can be reported to build a robot whose motor movement and mode of operation i.e. manual or automated are controlled by using a cayenne software that is used to build IoT based application. The wireless night vision camera is used for video recording and the live stream of the video can be viewed through an android application known as V380. The PIR sensor used on the robot sense the motion in its vicinity and notifies the same to the operator on the android phone or PC by short message service (SMS) through GSM service module equipped on the robot. The robot proposed can reduce the loss of life of on border areas, and other locations where military surveillance is required. With the help of live video streaming the operator can perform the patrolling duty and recce any unexplored area.

III. PROPOSED SYSTEM

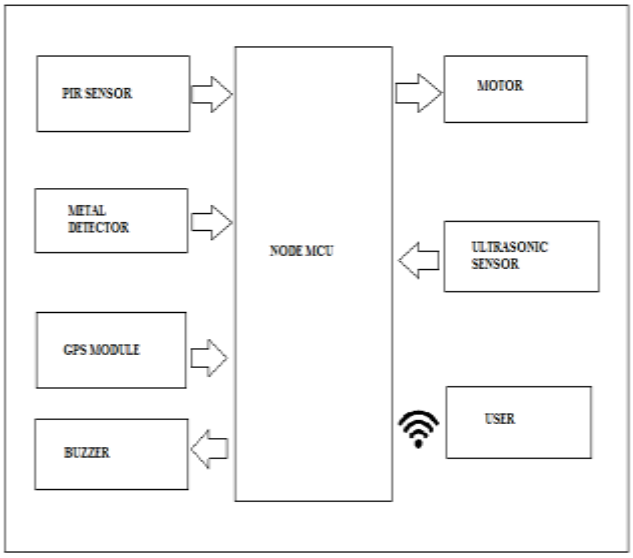

Fig 2. System Architecture

A. Description:

This robot will collect data from remote place and able to send those data to a remote IoT cloud database. This robot will be controlled via android mobile phone.
We can control the movement of the robot by sending instructions via internet. The robot will receive the instruction wifi module and process the data with microcontroller.
Then it will move the robot in all direction with the help of motor driver L298N by following the instructions received from android mobile phone.
Then the robot will collect data of sensor from that place and send those data via Wi-Fi to the cloud database with the help of node MCU ESP8266.
Then the data will be shown as well as the remote place can be monitored from anywhere in the globe from the internet server used.

B. Mathematical Model

The mathematical model for multifunctional robot system is as
Let S be Closed system defined as, S = { Ip, Op, Ss, Su, Fi, A}
Where,
Ip={sensor value, robot value}
Where,
Dtr - Set of training data
Dts – Set of testing data

Set of actions = A={F1,F2,F3,F4} Where,
F1 = Activate
F2 = Server Communication
F3 = Robot Functioning
F4 = Movement function

Ss- Set of robot's activity states
Su- success state is when a robot finishes the work
Fi- failure state is when a sensor not sensing and values and server communication fail.

IV. ACKNOWLEDGEMENT

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V. CONCLUSION

The Internet of Things (IoT) is consisting of physical devices which can be given an IP address and can be uniquely identified. It can be defined on the basis of three types. In this system IoT is used to control vehicle for parameters like Distance, Thermal Activity , Metal Detection and also for this Wi-Fi enabled microcontroller is used provide GPS coordinates for updated position of

vehicle after interval of every 5000 milliseconds and send data cloud.

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