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AUTONOMUS ROBORT NAVIGATIONSYSTEM USING ULTRASONIC SENSOR

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ABSTRACT:

The aim of the project is to provide a new or modified system in the area of surveillance which is very mandatory in many areas around the world. It can be used in all the areas where surveillance comes into a major aspect. Thus the project functions as a very efficient way for surveillance by providing a video output to the controller and avoiding obstacles automatically. The software used here is Arduino compatible C and the hardware used is TELNET, ATmega 328 board and Ethernet board.

Keywords: DC Motor, TELNET, IOT.

1. INTRODUCTION:

Surveillance is very much mandatory in today's rushing world. A sense of protection is achieved through surveillance. Thus, it is a very tedious process for a person to cover the entire area under surveillance. Hence the idea of automation plays a major role. The robots are very useful in this operation. This also reduces labor cost and covers a large area with a comparatively lesser time. This wireless controlled robot is very efficient in this process. The output is achieved with ease by the controller. The components used are very much useful for performing the

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surveillance operation. The SPduino ATmega328 controller board is a microcontroller board based on the ATmega328P (datasheet). Servo shield is used to power the PWM chip and determines the I2C logic level and the PWM signal logic level. The IR Sensor is used to sense any kind of obstacle on the robot's way. The Ethernet board used here is very essential for the Arduino board to be connected to the internet. The wireless camera that we have used is used to transmit the video signals to the user at the control end for better efficiency in controlling. The Servo motor used is used for fixing the camera as it provides the motion in both the X and Y direction. The servo motor controller is used for controlling the servo motor and the command for direction flows through this to the servo motor. The advantage in this project is that we have used the concept of IOT (Internet of Things). Because of this it can be controlled even with a smart phone connected to the same network as the robot. This is achieved as said by the Ethernet board which connects the Arduino board to the internet. Due to these advantages one can take control of the robot from any distance and can receive the data from the robot instantly. As the size of the robot is small it can be operated with ease in a very narrow and crooked pathways and places that humans cannot enter and also avoids the obstacles automatically as human errors are unpredictable and the robot can be saved from damage. Even though there are many techniques in surveillance, as the use of smart phones is major among the people around the world, this technique will be successful in the area of surveillance

2. PREVIOUS STUDY:

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Now a day the high standards of living have encouraged automation to come on the van and be an integral part of home design. At the same time, the environmental relation has ensured that energy-efficient housing models and appliances are used. So, we proposed the system called homey, a robot which can do tasks on behalf of a person at home. Our project aim is to develop a robot which can recognize the voice and perform tasks according to the command. It can be controlled manually remotely by android smart phone application or any internet enabled device through internet. So that it can be used by anyone and specially can be helpful for physically disable persons. IoT is the concept which creates a relationship between user and system remotely. It also creates interconnection between devices. There is three C's on IoT Communication, Control and Automation and Cost Savings [1]. We have tried to implement IoT so that user can control, communicate with the robot within a low budget. The user also can observe the environmental condition by using sensors. To connect with the internet, Wi-Fi Module with its low-cost effectiveness can be very useful and easy to use. Through internet a user can control the robot and its action remotely [2]. In 2017, J. Chandramohan, R. Nagarajan, K. Satheeshkumar, N. Ajithkumar, P. A. Gopinath and S. Ranjithkumar have worked with ESP8266 Wi-Fi module [3]. They have worked with Arduino UNO and ESP8266 Wi-Fi Module to control home appliance remotely. The user can control it without internet but using voice command [4]. There is a voice recognition system attached to the robot. There is a difference between recognizing voice and speech [5]. It depends on what type of recognition module and which algorithm will be implemented to the robot to recognize the voice of a user. The robot can only recognize voice, cannot

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differentiate the users. In 2015, K. Kannan and J. Selvakumar have worked on ARDUINO BASED VOICE CONTROLLED ROBOT in India. They have used EasyVR Module as voice recognizer device [6]. They have also used Arduino mega 2560 as microcontroller

3. PROPOSED SYSTEM:

The robot can be controlled by android application as figure 2 through internet using Wi-Fi module. While user press any button on the application, corresponding commands are sent via internet to the robot. The commands are in the form of ASCII character. The Arduino on the robot then compare the received command with its pre-defined commands and control the servo motors, gear motors, sensors and other peripherals to move forward, backward, left, right, stop, move hands, fingers or measuring sensor values. The temperature button send command to Arduino to check temperature sensor value and the value is sent back to the user. Temperature value also displayed on the liquid crystal display attached on the front side of the robot. If the user presses the auto button or gets disconnected from internet the robot can move anonymously. During the anonymous mode sonar sensor helps it to avoid obstacle. The sonar sensor HC-05 helps to measure distance of the obstacle in front of the robot. The sonar sensor generates ultrasonic sound using trigger. Then it reads the echo Pin, returns the sound wave travel time in microseconds. The distance is calculated using the following rule.

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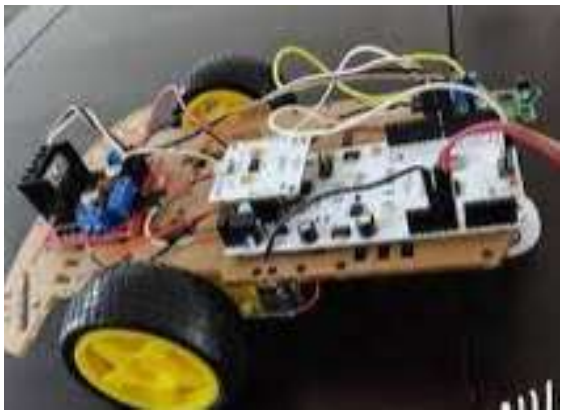

The above pictures serve evident to the working of the model and its functionality. The following outcomes were obtained as an output of the fabrication. The models movement was executed as designed. The video output was available to the operator and the control was made in a remote distance. The terrains on which the robot would perform were constrained to some factors.

4. CONCLUSION:

Thus this design and the execution of the model of the surveillance robot, controlled through IOT, will be considered as a extending leap in the area of surveillance. This will enhance the quality of the service provided in the area not accessible by the human beings. Thus this will ensure to provide success to all the areas involving surveillance. This robot can find its purpose in many fields, especially in areas of military operations, for the surveillance of foes' activities and the necessary preparations to handle it and providing the proper response to the situation. Future plans inclusive of reducing the size even more and providing the flexibility to access all kinds of terrains. This will increase the reliability and the accuracy of the data produced even more than the present model.

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