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Design and Development of Android Based Remote Control Car Unit for Search Missions

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ABSTRACT:

This project work is focused on the remote control car which is widely used in search missions such as in the occurrence of natural disasters and calamities. This system is developed using ARM 7 (LPC2148) microcontroller to detect the obstacles and the live bodies that are caught beneath the natural disaster without any harm to human beings. This car module is made up of a commercially available remote car chassis and controlling of the motor is performed using motor control unit (L293D). An exclusively developed Android application is adopted for controlling the car with Bluetooth as the platform. Also the UV sensor is integrated in the system to sense the obstacles and the objects. The Wi-Fi camera is erected for monitoring of real-time situations. The Android application uses the embedded orientation sensor on the Smartphone to determine the four directions (forward, backward, left and right) intended by the user; hence, rotating the Smartphone to different directions results in to the corresponding propulsion of the RC unit. The control commands are transmitted to the RC unit through the Bluetooth communication. The Android application also receives (via WiFi) and displays the information from the camera in real-time. Here we can also provide the video processing and find out the required parameters from the video captured by the wifi camera placed on robot.

1 INTRODUCTION:

Robots are becoming a very useful part of our lives. They are being used in almost every field of life and are working quite efficiently. One of the major reasons for using robots is their accuracy in the job. They carry out the occupation with more accuracy than people as they just do what they are customized to do. As they don't feel anything furthermore they don't get drained, they accomplish more measure of work than a typical human. One of the exceptionally fascinating territories of apply autonomy is their utilization in reconnaissance. For all intents and purposes observation is a risky zone for people and for this occupation robots are more appropriate. A few spots are not reasonable for people to go and get data from that point. There may be life debilitating animals present or that spot might be a battle area and so on. So in such places robots carry out the occupation with more effectiveness for us. Cell phones are turning out to be increasingly prominent nowadays. Practically everybody is holding a Smartphone now a days.

They have changed our way of life and have turned into the vital piece of our lives. Because of changes in working frameworks these cell phones are anything but difficult to utilize notwithstanding for a typical individual. Android is the greatest player of this cell phone industry. In 2014 more than 80% of the cell phone business sector was in hold of android. Being open source, it gives a decent office to the designers to create applications and even improve its working framework. As android is such an adaptable cell phone we can utilize it in heaps of our employments. In this experimentation we have executed observation robot control through android portable over the neighborhood Wi-Fi system. We have chosen Wi-Fi over the Bluetooth because of moderately more extensive scope of Wi-Fi system when contrasted with Bluetooth. Other than in the event of Bluetooth, we have low scope of data transfer capacity. While if there

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should be an occurrence of Wi-Fi, we have similarly higher transmission capacity which gives us more speed in information correspondence and at last more effectiveness. The beneath figure speaks to the framework.

Additionally utilizing IP tending to will guarantee our information to reach at the required location. The reason is in the system, every host is given an interesting IP address and no other host has the same IP address at the same system. It makes the recognizable proof of required article on the system parcel simpler. In the wake of accepting every order robot send an affirmation back to the android versatile which guarantees the effective landing of the information at the goal and this usefulness makes the control framework more solid.

Fig. 1 System Diagram

2 LITERATURE SURVEY:

Bluetooth-based Architecture for Android Communication with an Articulated Robot is utilized. An Articulated Robotic Arm which is utilized as a part of Industry was proposed by Sebastian Van Delden and Andrew Whigham. It can be controlled by an android gadget in a modern settled setup. It can pick and put, and do some employing works which human can't do. By utilizing the gadget control we no compelling reason to reconstruct for each time we utilize the robot for various works. It can associate different sorts of other robot too to control them. In mechanical automated situations there are a wide range of robots playing out an assortment of assignments. Every robot is controlled by its own show pendant or by means of an organized attachment application. Be that as it may, to screen the status or roll out minor improvements to the programming of the robot, the client must acquire access to the pendant or terminal. With an end goal to dispense with this need, this paper presents an android stage that speaks with robots over a Bluetooth association Practical applications: To show one of the commonsense employments of this application, an average assembling floor environment was mimicked. Two Robotic frameworks were set up with circling programs. The initially reproduced a spot welding line by going to a beginning stage simply over a device containing a model vehicle and after that rapidly going to six focuses around the model. The second reproduced a palletizing line where the robot was customized to lift and place a chamber up from a bed and place it into another bed and the other way around. Every framework was outfitted with the run of the mill "stop crisis" and "stop typical" summons that are ordinary in manufacturing plants. The stop crisis order breaks the robot quickly while the stop ordinary summon permitted the robot to complete its present cycle in the system. The robots were then associated with the Bluetooth server application and the Android application was begun. This exhibition demonstrated the case in which a client could switch between robots running diverse projects rapidly and send those robot summons. Both summons executed exceptionally well on both recreations.

Changes in Control Systems Research Directions the adjustments in the degree and usage of control frameworks energized essentially by mechanical variables, minimal effort preparing, and coordinated interchanges have brought on two principle changes in

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the hypothetical ways to deal with control framework examination and outline. The first needs to do with the unequivocal thought of the interconnections; the system now should be viewed as expressly as it influences the dynamic conduct of the control framework. We take 1932 (production of Nyquist's paper "Regeneration Theory") as the birth date of advanced criticism control. Computerized control ideas were by and large broadly examined as ahead of schedule as the 1950s. One of the soonest arranged control frameworks innovations obviously started in 1983 when Bosch GmbH in Stuttgart started an inside project to assess the idea of utilizing an information system as a part of vehicle control applications. In 1986, Bosch presented the Control Area Network (CAN). Baillieul and Antsaklis: Control and Communication Challenges in Networked Real-Time Systems. The second change needs to do with a restored accentuation on dispersed control frameworks.

3. ANDROID-CONTROLLED SURVEILLANCE ROBOT SYSTEM:

This framework clarifies how we can control and parameter logging an observation robot utilizing an android gadget. The framework incorporates Wi-Fi switch, robot and two android mobiles, one portable for client with which he will send charges to the robot and the other android for robot to get the orders from client's android and makes an interpretation of it for robot to work it likewise. Both the android mobiles are associated with a Wi-Fi switch. It permits them to convey each other over the system. The explanation behind selecting Wi-Fi for this employment is its reach and data transfer capacity. The scope of Wi-Fi is much more noteworthy than Bluetooth. The most extreme scope of Bluetooth is right around 32 feet. Though in the event of Wi-Fi system the most extreme reach goes to right around 300 feet, which is very nearly 10 times more noteworthy than Bluetooth range. Furthermore, Wi-Fi innovation gives more transfer speed than Bluetooth. That is the reason Wi-Fi is path quicker than Bluetooth. At whatever point we associate with some system our PC or host is distributed an interesting IP address. This IP location is the key for correspondence over the system. Something else is port. The correspondence depends on both the ports and IP addresses. IP address informs the information concerning the goal host though on the host machines, these are the ports where application gets information from. As appeared in the Fig. 2, IP address keeps information from getting lost on the system and to achieve the required goal address and at that location, port number aides the information to reach at the goal application. All things considered IP address and Port makes Socket. Attachment resemble a pipeline and goes about as medium for the information to travel. In this control framework first both androids are associated with system (Wi-Fi switch) and after that association is built up between both androids through attachments. The start of the procedure is finished by the client's android as it is kind of expert host in the correspondence. Once the association is set up framework is prepared for correspondence. Client's gadget sends charges to recipient android where the collector android gets orders and subsequent to deciphering it for robot it sends back the affirmation to the client's android gadget. The principle motivation behind the affirmation is to make the correspondence dependable. So client might be fulfilled that orders are being gotten by beneficiary's android gadget and correspondence is done with no information misfortune.

3.2 BLOCK DIAGRAM:

ROBOT SECTION:

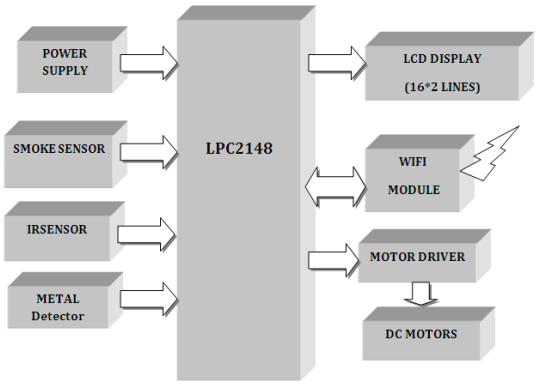

Figure 2 Robot Section

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MONITORING CONTROLLING SECTION:

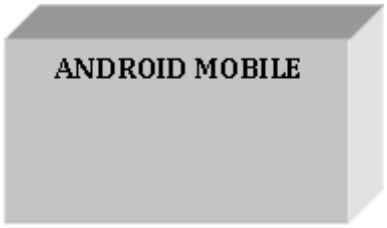

Figure 3 Monitoring controlling Section

3.1 WORKING:

There are two sections

1. Robot section
2. Monitoring or controlling section

Here the robot section consists of different sensors (smoke, ir sensor and metal detector sensor), wifi module, lcd display and dc motors. Here the sensor will sense the corresponding parameter s and fed to the arm7 microcontroller, then the controller process the data and send it to the monitoring node through wifi module. The ARM7 microcontroller also reads the commands from controlling node through wifi and control the dc motors accordingly. In the proposed system we are using a android mobile with installed App as a monitoring /controlling node.

The working flow is represented as follows.

3.2 FLOWCHART:

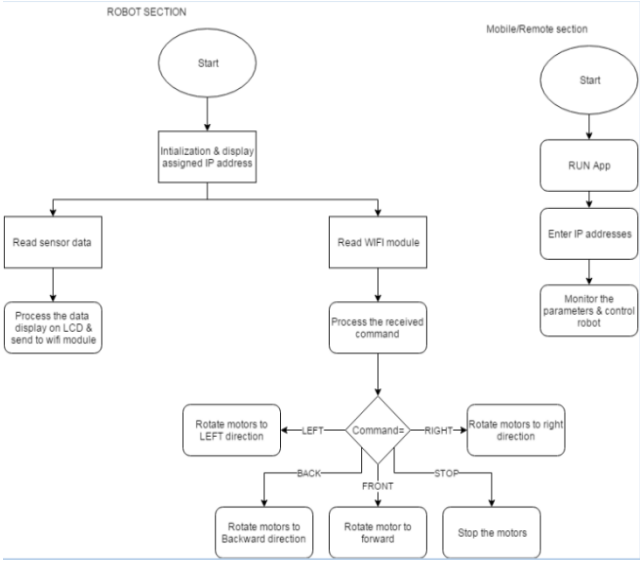

Figure 4 Flow chart

3.3PROPOSED SYSTEM:

This proposed framework introduces the instrument of controlling an observation robot utilizing android cell phones through attachment programming. Client offers summons to the robot from his android gadget. The android portable speaks with robot by means of neighbourhood Wi-Fi system. The key for sending charges to the robot is the IP tending to. The robot is outfitted with Infrared hindrance sensor, metal indicator and smoke sensors to quantify the anomalous states of specific industry. General framework comprises of a nearby Wi-Fi system, two android cell phones, sensors and a robot. One of the two android gadgets is forever connected with robot.

RESULT AND ANALYSYS

The proposed system was fully developed and tested to demonstrate its feasibility and effectiveness. The screenshots of the smart home app developed has been presented in Figure below.

Figure 5. Sideview of the AndroRC shows the android device as camera, DC Motors, ARM 7 board, and Wi-Fi router.

Figure 6. Topview of the AndroRC shows the android device as camera, DC Motors, ARM 7 board, and Wi-Fi router.

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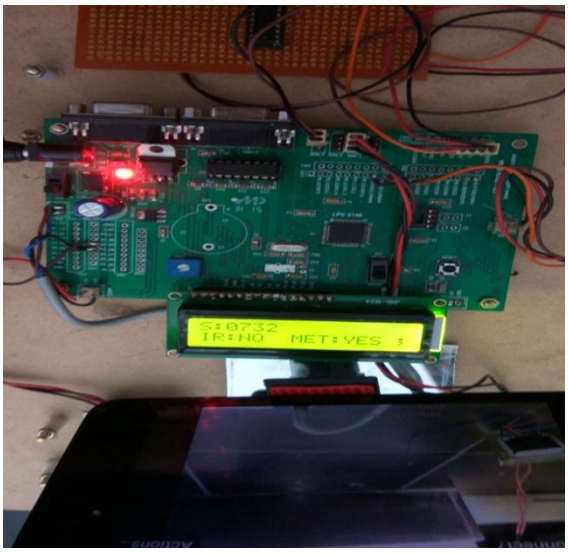

Figure 7. Topview of the AndroRC sensing the conditions the around the area

Figure 8. Screenshot of Android mobile application which is used to translate the orientations to different propulsion commands

5.CONCLUSION AND FUTURE SCOPE:

The surveillance is always has been a quite sensitive task. And it includes so many risks. So it's better to use robot for this job instead of people. And if you are able to control the robots with efficiency and accuracy then you can guarantee yourself with good results and success. This system is a good step for secure surveillance using robots.

Right now we have implemented the idea for local network that is established using a single Wi-Fi router. Therefore the access is limited to the area that is in range of that local network. So right now we are bound to the limited use of this system. But in future we intend to replace the local network by internet. In that case we will not be limited for the use of the system. We will be able to control the robot from anywhere in the world.

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