

ONE-SIZE-FITS-ALL ROBOT

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Abstract:

The Robots are specially design to make our life easier and purposes of various operations like military, industries, for home based application. For this, a robot is design and developed for multipurpose application. The method involving capturing real world data using digital image processing used to detect its obstacle which is found in its path. For making it multifunctional robot all the actions perform by user same actions perform by robot using stretch sensor. All these mechanisms are to be done by embedded. This is a wireless robot communication takes place between server and client by using Bluetooth, ZigBee and DTMF through Smart phones, Android OS.

Keywords - Android Os, Bluetooth, Wireless, Zigbee, Robot.

1. INTRODUCTION

Robots are smart machines that are programmed and used in many industry, manufacturing, production lines, or health, etc. [1]. These robots perform hard, dangerous, and accurate work to facilitate our life and to production increasing because 24 hours continuous working and without rest, and can do works like human but more precisely and with less time. There are two kind of methods of controlling the robot which is wired and wireless. The wireless robots are more convenient than wired Robot in terms of its range. The size of the wireless robot is large and cost is high as compare to wired robot. But for long distance communication purpose wireless robots are used specially used in unfavorable condition like fire rescue area, toxic gas area in such places these robots are used with much high efficiency [2]. Most of the robot there is a problem of task assignment and communication set up between user and robot. Different camera and sensors are used to detect obstacle. It is capable of finding its obstacle from source to destination [3]. In this we are design a multifunctional robot which performs multiple operations like motion in different direction. Robotics system is depending upon the combination of performance and robotics operator. Exact target distance measurement and calculation of distance and direction is to be done. Robots are inspired by different technology like ZigBee, DTMF, Bluetooth controlled. By a various operation can be done with in a One-Size-Fits- All Robot.

2. RELATED WORK

Robot has been designed and developed which has capability to fight with other robots. It is a wireless robot that can move wirelessly and also be able to immobilize .Interface Free Controller (IFC) is used as the brain of the robot to control the robot movements where all the data and information are processed in C language is used to program this microcontroller via MPLAB, so that it will function as desired.

3. PROPOSED WORK

The methodology to be followed for the project is as follows: In this the robot has been designed and developed which has capability that can move using parallel movement mechanism and used for surveillance operation in military border area. For surveillance we use image processing concepts. Using PIR sensor it detect object then it send alert through a Zibee where user can perform all operation at that time robot check during the object detection.

It also have another feature it can mimic all the action by controller from operation to place where robot present for that robot wear jacket in that stretch sensor is used were all the operation perform wirelessly and all the program embedded in propeller IC which is manufacture by parallax This is 40 pin IC inside this microprocessor 8 processor are inbuilt for synchronizing it's all multiple operation. For wirelessly connection we are going to use Bluetooth which is of having range of \100m.

A. Motion Detection and Face Recognition

Technology Used for Motion Detection is FPS technique i.e., frame per scaling. Video is collection of frames in this technique we use 16 MP cameras for capturing real world data, in one minute 1800 Frame will detected. Large no. of frames brings slow performance.



Fig.1. Shows 30 frames in one second

Depreciation & scaling is must. The difference between the previous capture image and present image is called scaling. In FPS technique first, middle and last frame is detected.



Fig.2. Shows frame per second

Hence in one minute $3 \times 60 = 180$ frame is calculated. This will increase performance, efficiency & speed.

B. Image Processing

This includes capturing the real world data, converting it into digital form and then processing the digitized data. Cameras will capture the surrounding view. The robot will be trained to recognize various

objects in the view field. Depending upon the objects and their distance the system will calculate the distance and the direction through which the robot will recognize enemy on border area. As it recognize any object it send alert to control system and during that duration if enemy try to harm that robot, robot will use gun mechanism for his protection.

C. Direct Drive Motor (DDM)

The DDM is the mode of controlling the robot directly by sending the movements directions to the robot by pressing the arrows on the Smartphone keypad, for example the user wants the robot to move forward, the user press the Up Arrow, the robot will Start moving forward, this command is applied by sending order to the robot via the connection, the robot receive the command, analyze it and then apply the corresponding movement.

4. CONNECTIVITY AND COMMUNICATION

For the communication of the robot with the cell phone or a mobile we are using the Bluetooth and ZigBee device. The Bluetooth device (HC-05) is attached to the robot that receives the data from the mobile and also can transmit the data.

4.1. Bluetooth

Bluetooth is a wireless communications protocol running at 2.4 GHz, with client-server architecture, suitable for forming personal area networks. It is designed for low power devices such as mobile phones [3]. Bluetooth now comes as standard on the majority of mobile phones, and desktop computers. It can be easily fitted with a module to allow Bluetooth communication.



Fig.3. Shows HC-05-Bluetooth Device

Bluetooth is the only appropriate communications protocol because there is no fear of getting the frequency interference. Bluetooth uses the MAC Address of the device. The Bluetooth gives the connectivity between two devices using their MAC Address. It can be range around 11.5 meter but we are increasing the meters up to 25 meter by a continuously create a trigger pluses mechanism.

4.2. ZigBee

ZigBee is a new Wireless sensor network technology characteristic of less distance and low speed. It can be used in some special situation for signal collection, processing and transmitting. ZigBee is a technology now being deployed for wireless sensor networks.

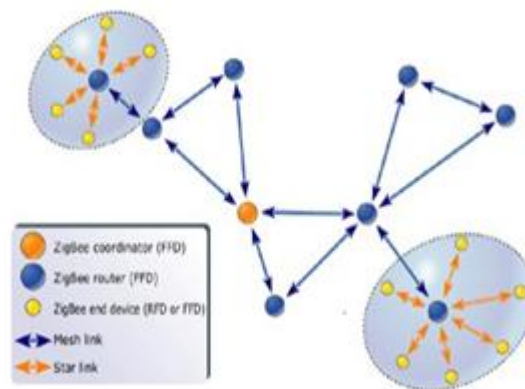


Fig.4. Shows ZigBee network topology

A sensor network is an infrastructure comprised of sensing, computing and communications elements that allows the administrator to instrument, observe and react to events and phenomena in specified environment. Typical applications include, but are not limited to, data collection, monitoring, surveillance and medical telemetry.

5. RESULT ANALYSIS

5.1. Start for establishing the ZigBee communication



Fig.5. Shows ZigBee communication with a Windows OS

5.2. Communication establish between server and microcontroller

After clicking on start it can be control the robot in ZigBee by a Visual Basic Project Output. The button value is send to server system and connection is established is shown in this window. As we turn on upper body movement button the LED will glow and the value which we are given to this button is transmitted from server to client system same operation will be followed by the lower body movement button and enable camera button and the last two buttons are used for future use.

5.3. Start for establishing the Bluetooth communication

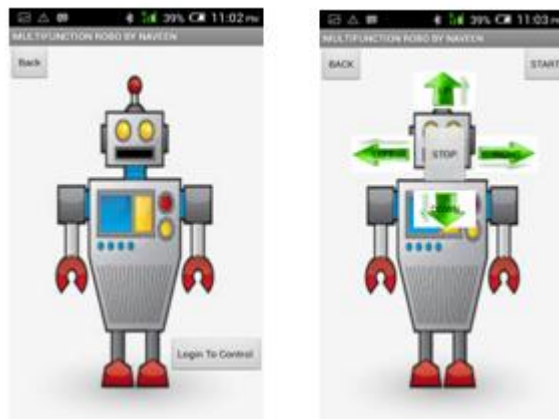


Fig.6. Shows Bluetooth communication with a Android OS

Insert The MAC address of Bluetooth connectivity clicking on the login Button.

5.4. One-Size-Fits-All-Robot



Fig.7. Shows One-Size-Fits-All-Robot

CONCLUSION

In this work communication of network between server and client and motion detection has been done after doing literature survey of various approaches. The proposed work gives the complete architecture of multifunctional robot. All the functions present in robots which are used in war all with some advance features present in these multifunctional robot. The experiment has integrated a high performance Smartphone with robotics and utilized the Bluetooth technology as a fast, secure and reliable connection between them. For synchronizing its all functions propeller IC is used in which all programs are embedded.

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