AN INNOVATIVE APPROACH TOWARDS HANDLING OF OBJECTS BY USING ARM7

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ABSTRACT

Initially in olden days there were no robos to work for/to replace the human beings. To replace the things from one place to another, people are used. To overcome that problem we have introduced this process, which performs the task of lifting of objects from one place to another. In our proposed system we are going to place the robo arms on the robo base with wheels and going to control that by using the mobile phone. We also placed the metal detector at the bottom side of the robo to identify bombs on its way. Basically the task which requires more than one person will be done by robo which is operated by one person. To perform that operation, we are going to use an application developed by android.

Keywords: Android App, Bluetooth, Robo Arms, Mobile Phone.

I. INTRODUCTION

It is very tiresome by some reason to perform the programming part for the working conditions of the ROBO and to manipulate the ROBO tasks. Generally the experts are required to perform the programming for the control of the robo. These days the demand for the ROBO is very high because it is very flexible to perform the operation of positioning of the things from one place to another. Just before few decades there were no robos, there were only machines which will be placed in only one position and they will perform the task and provide the required output. By the introduction of robo, it has reduced the labour cost, their wages, and their demands. Today to buy a robo is bit costly but it is one time investment which will reduce lots of money later. This technology is acquiring a huge demand these days, which will reduce the work burden for the human beings, which require the human brain the working parts will be the robo ones. These days the robo is having a huge demand for the quality of the product and the assurance given by the ISO (International Standards Organization), when compared with robo humans are not capable to do the work done by the robos. These are mainly used in the places where ordinary human beings cannot withstand the location temperature and gases emitted. These robos are mainly designed to move in the worst situations and to perform the task, which are done by many people.

Here are some of the important reasons why we need to use the robo in our industries

1) Manpower is reduced.

2) We can assure more quality work.

3) Has capacity to work in any situation.

4) More consistent and flexible.

5) Will increase the production.

In today's advanced world the automation is greatly improved, that has increased the production to a huge extent. To prepare a robo just it requires the few quality and experienced persons to write the coding for the robo operations.

II. SYSTEM OVERVIEW

2.1 Micro Controller (LPC 2148)

It is the main part of the project which is going to perform the task of controlling the different slaves attached to it. Here we are going to send the information from the android app to the receiver section of the kit. That information will be transmitted to the controller, so according to information received the controller is going to operate the external device (robotic arm). I have chosen this controller because it has many advanced features when compared to other controllers. The main features is that it has a capability of storage is around 32kb, and has in-built flash memory of 512kb.

It is a 32-bit controller, which can perform the operations of 32 bit data. It takes less number of instructions cycles to execute the program. It has in-built analogue to digital converters with 10-bit resolution which will convert the analogue information to digital form. It has internal SPI and I2C protocols, which are used for the data linkage. These are the some of the reasons why I have selected this controller to perform this operation.

Fig 1: ARM Board

2.2 Robotic Arms

The main application of the project is to pick the object from the one position and need to place that object in another place. There are many types of robo arms they are

- Cartesian robot / Gantry robot
- Cylindrical robot
- Spherical robot / Polar robot
- SCARA robot
- Articulated robot:
- Parallel robot:
- Anthropomorphic robot

Fig 2: Pick and Place Module

2.3 Android App

Fig 3: Sample Android App

We have developed an android app to perform the operations, of moving the robo arms.

This app should be installed in the mobile and while executing the program we need to open it. It consists of key space to be pressed, then the key pressed a coded message will be generated and that will be transmitted to another Bluetooth module. So according to the button pressed, the robo arm is going to operate. When the button is pressed from the app a coded message is generated and is being transmitted to the kit.

To perform the transmission we are going to use the Bluetooth module. Our robo consist of wheels and will also make the robo to move in all the directions.

2.4 Bluetooth Module
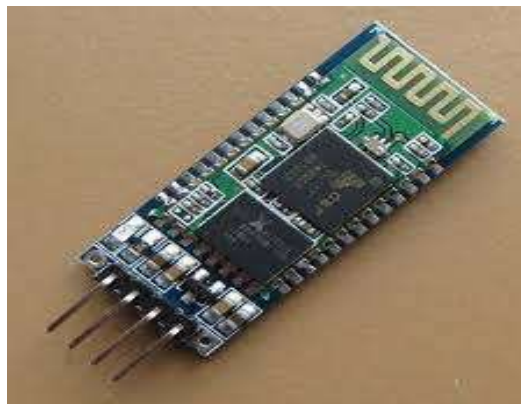
Fig 4: Bluetooth Module

This module is connected to the kit, whatever the information we need to transmit will be transmitted through the Bluetooth of the mobile and it will be received by the Bluetooth module of the kit. That information will be moved to controller and will be compared with the in-built value.

One disadvantage of this module is that its range is very short. We need to transmit the information with in short distance.

2.5 Metal Detector

This metal detector is used to detect the metals which are very nearby. They are considers in the bomb detection, because to prepare the bombs they will be using the metals likes spades, small nuts and bolts, when the bomb explodes those metals will be blown at most speed and get pearsed into the human body, which has the capacity to kill the human beings. They are usually hand held metals detector with the indicators or buzzers to indicate the metals.

Fig 5: Metal Detector

Here in our project it is placed at the down side of the robo which will identify any metals on its way.

III. BLOCK DIAGRAM
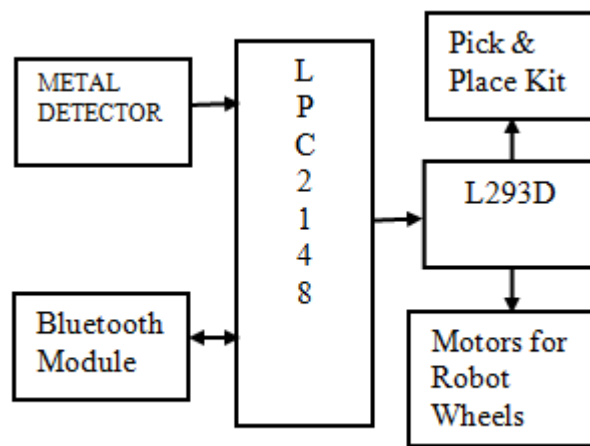
Fig 6: Block Diagram

IV. WORKING PROCESS

Our main aim is to control the robo by using wireless communication. For that we are using Bluetooth module to perform the task. When we start our kit our robo arms would be in the still position and we require the mobile phone with the android app installed in it. Firstly open the android app and connect the Bluetooth of the mobile with the Bluetooth connected to the kit.

So we need to press the one button from the keypad, the buttons respective code will be transmitted to the Bluetooth of the kit and to the controller. Then the comparison would takes place with the received one and action will be performed according to that.

So initially from the mobile we need to press the button or we need to transmit the letters. When the first character 'A' is transmitted then the robo will move forward, if the character 'B' is transmitted then the robo will move backward. When the character 'C' is transmitted the robo will move right side. When the character 'D' is transmitted the robo will move left side direction. When the character 'E' is transmitted then the robo will be get into the stop condition.

When the character 'F' is transmitted to the kit then the robo arm will open, when the character 'G' is transmitted then the robo arm will close, when the character 'H' is transmitted then the robo arm will be lifted and when the character 'I' is transmitted then the robo arm will be moving down. One final key when transmitted 'J' then all the operations will be stopped.

We have also placed the metal detector on the robo bottom side which is used to identify the bombs, so when the bomb is identified then the robo is going to display on the LCD screen that bomb has been detected.

V. FLOW CHART
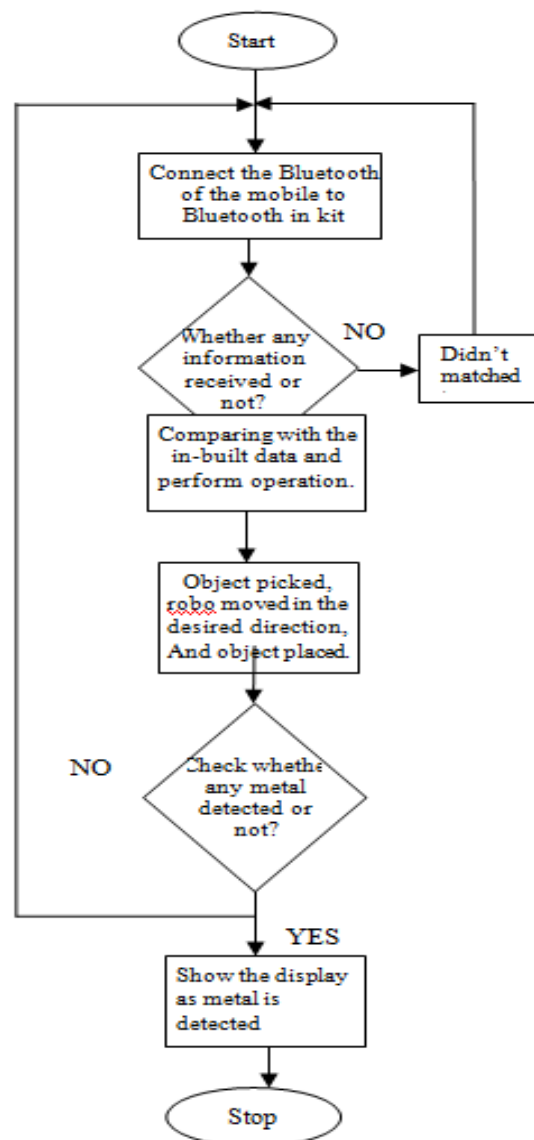
VI. EXPERIMENTAL RESULTS

We have executed the project and checked the output by placing the robo somewhere and making to move to a position and pick the fevicol bottle and bring back to the other room and place it in one ring.

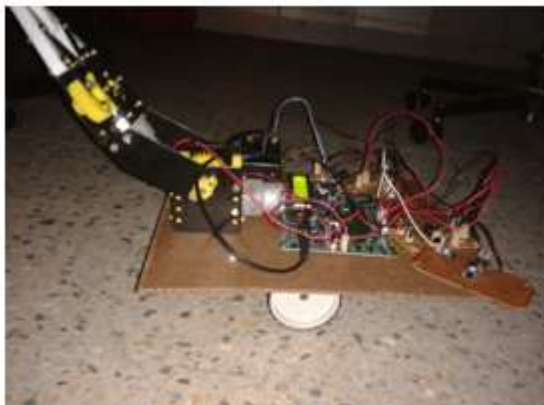In between we have placed the metals and the display has shown the content that metal is detected.

Fig 7: Pick And Place Robo

Fig 8: Robo Lifting The Object

VII. CONCLUSION

Here we have prepared a prototype of the robo which will move in all direction and will bring the objects from the different places and place them in one room. With the help of the metal detector it acts as the bomb detector, we have executed by placing metals on its way.

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