IJIRCCE

e-ISSN: 2320-9801 | p-ISSN: 2320-9798

# INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

## IN COMPUTER & COMMUNICATION ENGINEERING

Volume 10, Issue 5, May 2022

INTERNATIONAL STANDARD SERIAL NUMBER INDIA

Impact Factor: 8.165

International Journal of Innovative Research in Computer and Communication Engineering

| e-ISSN: 2320-9801, p-ISSN: 2320-9798| www.ijircce.com | |Impact Factor: 8.165 |

|| Volume 10, Issue 5, May 2022 ||

| DOI: 10.15680/IJIRCCE.2022.1005018|

# Automatic Pick & Place Robot Arm With Fire Fighting Unit Robot

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**ABSTRACT:** Fire Accident will occur very rarely, but once it occurred it consequences will be devastating. So at any cost fire accidents should be eliminated completely. Through this project you are going to build for a unique fire protection system for the Homes and commercial buildings.You will need to interface the microcontroller with flame sensor, dc motor and motor driver. You will program the microcontroller in such a way that say whenever the flame sensor detects the smoke in the air, a notification will be sent to respective authorities. After sending a notification the microcontroller will immediately check the fire presence in the room. If the fire is detected, immediately we can move robot there via Bluetooth control and pick place function will be turned on.

**KEYWORDS:** Data acquisition, Node MCU, IR sensor, Flame Sensor, Robot

## I. INTRODUCTION

Robotics is the branch of engineering science & Technology related to robots, and their design, manufacture, application, and structural disposition. Robotics is related to electronics, mechanics, and software. Robotics research today is focused on developing systems that exhibit modularity, flexibility, redundancy, fault-tolerance, a general and extensible software environment and seamless connectivity to other machines, some researchers focus on completely automating a manufacturing process or a task, by providing sensor based intelligence to the robot arm, while others try to solidify the analytical foundations on which many of the basic concepts in robotics are built [1].

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## II. METHODOLOGY

### *A. Objectives*

- To control the displacement of the robotic arm so that the arm can be used to pick and place the elements from any source to destination.
- To control the displacement and movement of robotic arm using Wireless Transmitter and Receiver.
- To implement a robotic arm with two degrees of freedom.

### *B. Literature Review*

Blutooth Controlled Robot [1] is designed to develop android application based a robotic vehicle for remote operation. This is a kind of robot can be helpful for mobility aid for elderly and disabled people. And images transmission and reception. Advantages of Bluetooth has low costs and low power and nature can be pointed to parts of Bluetooth has been added into various types of mobile devices such as mobile phones, PDAs and other wireless set

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Android Application Based Bluetooth Controlled Robotic Car [2] is indeed a cost-effective and efficient project. The novelty lies in the fact that it is a cost-effective project with a simple and easy to use interface compared to existing ones. Also the Bluetooth RC Controller application is more user friendly. The robot is small in size so it can be used in spying purpose. With few additions and modifications, this robot can be used in army for detecting and disposing hidden land mines. The robot can be used for surveillance. In future we can interface sensors to this robot so that it can monitor some parameters and we can improve the efficiency using Internet of Things (IoT) technology. We can also add wireless camera, in order to incorporate other security features.

Android Mobile Phone Controlled Bluetooth Robot Using 8051 Microcontroller [3] is to realise the smart living , more specifically the home lighting control system using Bluetooth Technology. Robot and smartphones are a perfect match, specially mobile robots. As phones and mobile devices are each time more powerful, using them as robot for building robot with advanced feature such as voice recognition. Android bluetooth-enable phones and bluetooth module via HC-06 and communication among bluetooth devices. It is concluded that smart living will gradually turn into areality that consumer can control their home romotely and wirelessly.

Arduino Based Bluetooth Controlled Robot [4] in this the Wireless control is one of the most important basic needs for all the people all over the world. But unfortunately the technology is not fully utilized due to a huge amount of data and communication overheads. Generally many of the wireless controlled robots use RF modules. But our project for robotic control makes use of Android mobile phone which is very cheap and easily available. The available control commands are more than RF modules. For this purpose the android mobile user has to install a designed application on her/his mobile. Then he/she needs to turn on the Bluetooth in their mobile. The wireless communication techniques used to control the robot is nothing than Bluetooth technology. User can use several commands like move reverse, forward, move left, move right using these commands which are given from the Android mobile. Robot has a Bluetooth receiver unit that receives the commands and move left, move right using these commands which are given from the Android mobile and send it to the Arduino circuit to control the motors. The Arduino UNO then transfers the signal to the motor driver IC's to operate the motors.

## III. PROPOSED METHOD

1) The pick and place robot being implemented to ease the process of sorting, process of moving heavy materials etc. Usually the transfer process of the heavy materials is being carried out, using man power and if the transfer process is repeated for a period of time, it can cause injuries to the operator.
2) By using the particular robot the operator, will no longer have to bent and lift up heavy loads thus preventing injuries and increasing the efficiency of the work. Operator will make mistakes whether small or big in a while. In the industrial world, the industry cannot afford to take any kind of mistakes. As every mistake is costly whether interns of time, money and material.

### *A. Block Diagram*

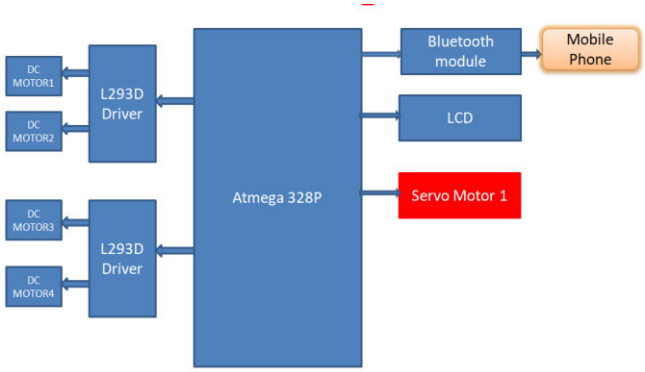


Fig 1 Block Diagram Of Robot

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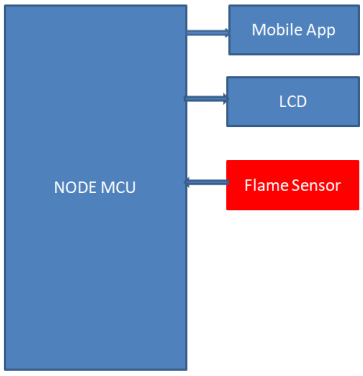


Fig 2 Block Diagram Of Fire Detection Unit

Fig 1 shows the proposed system. It mainly comprised of Arduino micro controller, bluetooth module(HC-06),four DC motors with driver IC, voltage regulator. The Bluetooth device, driver IC and voltage regulator are interfaced with the microcontroller. when the user given a command to the microcontroller, it is then checked with the prestored character and if they are same then the robot do the particular operation such as it can move to any direction forward, backward, left, right, arm up, arm down, pick up object and place it .There are five motors are used, four motors are used for the movement of the vehicle and the remaining one for the movement of gripper. The maximum upward and downward movement of arm and closing and opening of jaw is limited by the mechanical push button type switches. For the proper working of motors, driver IC (L298N) are used. Single L298N can handle a set of two DC motors simultaneously. It works on the concept of H-bridge. Voltage regulator provides a regulated voltage for the smooth functioning of the device. Blue control app is used to sending commands to the controller. Blue control is a basic Universal Remote Control for Bluetooth enabled serial devices such as Bluetooth modules connected to a controller. When a button is pressed corresponding ASCII code will send to the controller.

*B. Flow Chart*

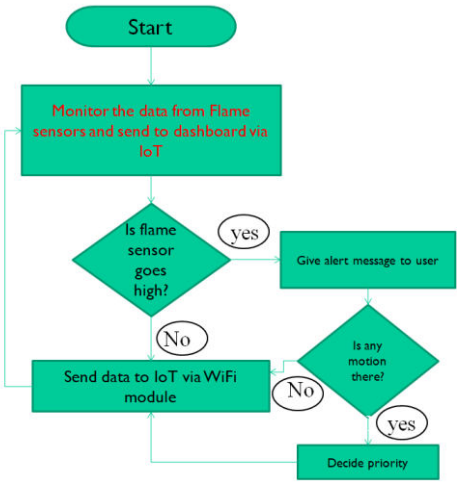


Fig 3 Flow Chart of Fire detection

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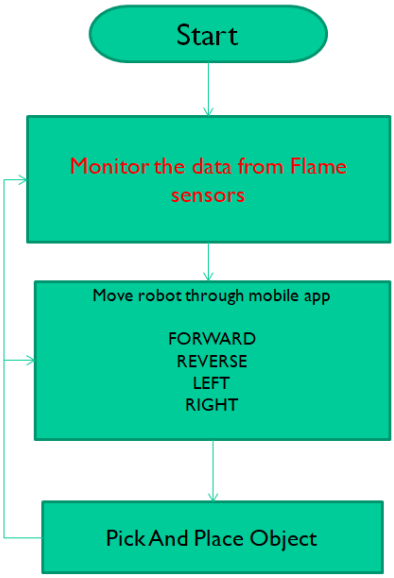


Fig 4 Robot flow chart

## IV. RESULT

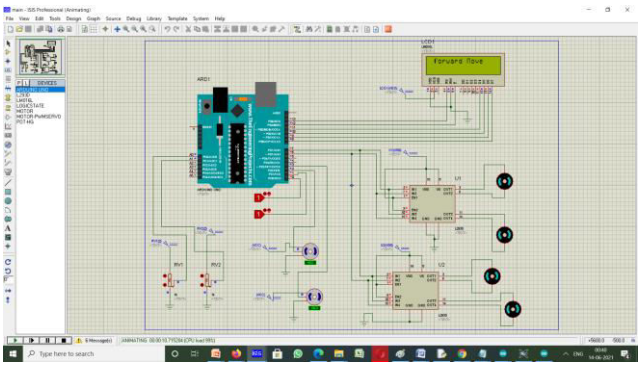

Fig 5 Circuit Simulation

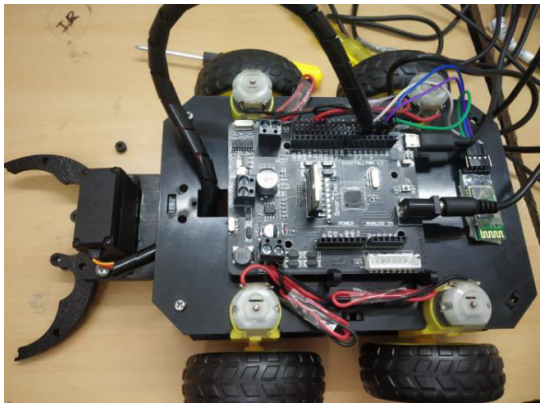

Fig 6 Final Snapshot

## V. CONCLUSION

The proposed concept of pick and place robot using Arduino is implemented via IOT play station. It is found that, the robot so implemented has the ability to locate itself to the location where the object to be lifted is available with the

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help of chassis and four dc motors. Further depending upon controlling action provided to servo motor it lifts the object and locates the same at required destination.

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Impact Factor: 8.165

doi cross ref

ISSN INTERNATIONAL STANDARD SERIAL NUMBER INDIA

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