



Wireless Pick and Place Robotic Arm Vehicle Using Arduino

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ABSTRACT

Robotics deals with the design of robots their manufacturing and applications. In recent years the industry and daily routine works are found to be more attracted and implemented through automation of Robots. Robot gained more importance in the modern era since it require less cost to operate than a human labor to do the same type task, also once programmed robot will perform better than an experienced human labor. Now a days industries are turning towards computer based monitoring of tasks mainly due to the need for the increased productivity and delivery of the final products with maximum quality. The pick and place robot is one of the technologies in manufacturing industries which is designed to perform pick and place operations. Due to the inflexibility and generally high cost of hard computerization systems lead to the use of industrial robots. The work is designed to develop a robotic arm vehicle with a soft catching gripper that is designed to avoid extra pressure on object. The robotic vehicle is arduino controlled. A robotic arm is designed using arduino to pick and place the objects via user commands. It will pick and place an object from source to destination safely. Based on the commands given by the user the robot moves accordingly. At the receiver end there are four motors interfaced with the micro controller. Two for the vehicle movement and the remaining two are for arm and gripper movement.

Keywords: IR Sensor, DC Motor, Microcontroller, Soft catching Arm gripper, Bar code Scanner

I. INTRODUCTION

Machines called robots are faster and more effective than people. The term robotics is actually defined as the study, design and use of robot systems. Robots are generally used to perform unsafe, hazardous and unpleasant tasks [1]. Construction of the manipulator as the arm of the robot is based on human arm. . Robots are built and programmed to be job specific. The development of electronic industry robot system technology expanded

increasingly [1]. In this highly developing society time and man power are critical constrains for completion of task in large scales. The automation is playing important role to save human energy in most of the works [2]. One of the major and most commonly performed works is picking and placing of jobs from source to destination [1]. The pick and place robotic arm is an arduino controlled based which can detects the object, picks that object from source and places at destination.

II. PICK AND PLACE ROBOT

The system consist of a vehicle carrying a robotic arm. It will pick and place object from source to destination according to the user command. For that a communication is established from Arduino Uno. When the controller receives the command, is compared with the pre stored value and do corresponding actions such as, It can move either forward, backward, left or right. In addition to this the arm can be move up or down and the gripper can move away or close for pick and place application. . The robotic arm consists of base plate and gripper. The motion to the robotic arm is given by dc motors. There are total four 12V DC motor, two on back wheels, one at arm which has 4 degrees of rotation and one motor at the gripper.

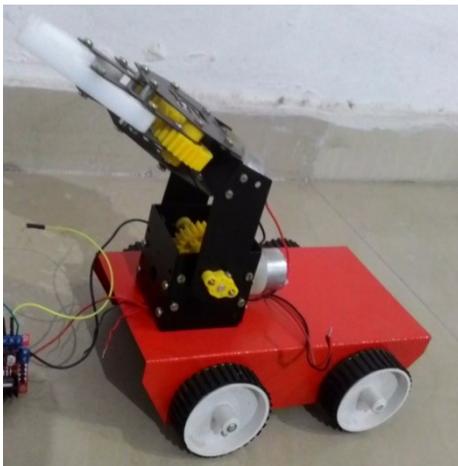


Figure 1

III. LITERATURE SURVEY

The “Wireless Control of Pick and Place Robotic Arm Using an Android Application” is designed by Muhammed Jabir.N.K1 , Neetha John2 , Muhammed Fayas3 , Midhun Mohan4 , Mithun Sajeev5 , Safwan.C.N6 to develop a pick and place robotic arm vehicle. The android application device transmitter acts as a remote control that has the advantage of adequate range, while the receiver end

Bluetooth device is connected to the microcontroller to drive DC motors via motor driver IC for necessary operation. Remote operation is achieved by any smart-phone/Tablet etc., with Android OS; upon a GUI (Graphical User Interface) based touch screen operation.

The Microcontroller Based Pick And Place Robot is designed by Anush Mohammed.S, Karthikeyan G ,Mohamed Hasanali , Mohamed Ismail to develop a pick and place robotic arm vehicle. It has 2 degrees of freedom and contains. Arm 1 is vertical rod, which is used to move Arm 2 with gripper assemble lesser than 180 degrees from picking platform to the destination platform. Stepper motors are used driver Arm 1 and Arm 2 in increasing and Decreasing Directions. Limit switches are used as sensor to detect end of Movement. We use electromagnet to pick the object and place it in the Specified place. A micro controller is used for homing the Robot, Robot Movement, Robot Controls & indicates the materials picked and placed.

IV. RESULT

The project or the robot been made is a working prototype of the pick and place robotic arm vehicle. The prototype presently cannot handle much weight but after further developments and introduction of high torque motor in the circuit will help in picking up large weights, for e.g. , bombs. Further developments like, introducing a wireless camera to the circuit may also lead to addition of various applications of the pick and place robot like, it can pick a bomb from a crowded place and place it at a place where least damage will occur to human life and property. Even the usage of Bluetooth can be modified by using other connections like GSM or Zigbee which will be

advantageous in the respect of range. Since, the range of Bluetooth is limited, it is now the limitation of our project which can be removed by using Zigbee which is efficient in terms of range.

V. CONCLUSION

The aim of our project is to reduce manpower and development of wireless control of pick and place robotic arm. The microcontroller used is an Arduino software is used to program it. In the modern era, time and man are major constraints for completion of a task, but by our product, it can minimize. The Hazardous operation is difficult to do by manpower but by our product, any industrial and hazardous operation can be done easily and safely.

VI. FUTURE SCOPE

The robot so programmed for pick and place operation can be made versatile and more efficient by providing the feedback and making it to work on own than any human interventions. It can be made possible by image processing tool interfaced with this Arduino. There are many quires and many hurdles for robots, at every stages. We need control for development of good hardware to make arms or hands that can perform all the things but the simplest is pick-and-place operations that are implement in industries. The pick and place robot is have various applications. As we are using here arduino based system the applications is in both the domestic and industrial fields. The future applications are,

1. Bomb diffusion: After some modifications in this robot we can improve the robot for the bomb diffusion purpose. Using the web cam we can train the robot to diffuse the bomb hence without

putting human life in danger we can fight against the terrorism

2. Lab: Our robot can handle dangerous chemicals in chemical lab our in nuclear reactor labs which are hazardous to human body.

3. Having a android control facility and webcam this robot can perform many tasks that human cannot or dangerous for human to handle.

4. With some modifications in this robot ,it can be used for helping the physically challenged people.

VII. REFERENCES

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