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ijircce@gmail.com

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# PICK AND PLACE ROBOT

Rukmani GM<sup>1</sup>, Inchara R<sup>1</sup>, Nayanashree LS<sup>1</sup>, Naveen KS<sup>1</sup>, Roopesh MU<sup>1</sup>, Premakumari P<sup>2</sup>

Polytechnic Students, Department of ECE, Government Polytechnic, Turuvekere, Karnataka, India<sup>1</sup>

Lecturer, Department of ECE, Government Polytechnic Turuvekere, Karnataka, India<sup>2</sup>

**ABSTRACT:** The popular concept of a robot is a machine that looks and works like a human. The industry is moving from the current state of automation to robotics to be able to provide similar products efficiently. While all research is aimed at providing robots with increasingly anthropomorphic and human-like features and superhuman abilities, today's robots will not resemble humans in anyway. One of the most common types of robots used in business is the robotic manipulator or simply the robotic arm. It is an open or closed kinematic chain consisting of rigid links interconnected by movable joints.

**KEYWORDS:** Pick and Place Robot, Robotic arm, Mechanism, Automation, Bluetooth

## I. INTRODUCTION

For years people have been trying to replace workers with machines. Machines called robots are faster and more efficient than humans. The term robotics is defined as the study, design and use of robotic systems for manufacturing. Robots are often used to perform unimportant, dangerous, repetitive, and unimportant tasks. Material handling, assembly, arc welding, resistance welding and machine tool handling, painting, spraying, etc. They do many things like Many elements of the robot are inspired by nature. The construction of the manipulator as a robotic arm is based on the human arm. Robots can control things like picking and placing jobs. It can also work independently. The development of robotic system technology in the electronics industry is expanding day by day.

Based on these applications, service robots with machine vision capabilities have been developed recently. In a highly developed society, time and manpower are essential to complete large projects. Automation plays an important role in rescuing workers in many routine and often moving jobs. The important and most important task is to select and place from place to place. Today's business is moving towards computer-based automation mainly because of the need to increase productivity and deliver finished products with uniform quality of the controversial and often high cost of complex electronic devices used to perform production tasks in the past has led to an interest in using the technology's high-capacity production in a changing environment and at a lower cost. The use of the industrial robotic arm represents some of the latest developments in production automation. However, today's industrial robot arms also have monolithic mechanical structures and closed system software architectures. They usually specialize in simple repetitive tasks that do not require high precision. A pick and place robot is a human-controlled system that detects an item, picks it up from a location, and places it in the desired location.

## II. RELATED WORK

Harish Ket.al The pick and place robotic arm consists of a robotic arm placed on a moving vehicle (chassis). The vehicle is able to move along any type of surfaces irrespective of it is smooth or rough. The pick and place robot uses four motors for the operation of the chassis, two servo motors for the operation pick and place operation. The pick and place arm consists of an arm assembly with a jaw, which is only able to move in up and down direction [1].

Ravi kumar Mourya et.al The main objectives of this project are to design and implement a 4-DOF pick and place robotic arm. This project can be self-operational in controlling, stating with simple tasks such as gripping, lifting, placing and releasing. In this project, the focus is on 4-DOF articulated arm. Articulated arm consists of revolute joints that allowed angular movement between adjacent joint [2].

Savitha H Goudar et.al On detection of object, the object is picked and placed from one location to another location by communicating with each other for task completion .It continues to its location, does its work at that location and stops. Thus, a co-operative system of individual robots that interact with each other and perform tasks is created[3].

Naga Sudheer Ravela et.al This system has 14 independent commands for all the four fingers open and close, wrist up and down, base clockwise and counters clockwise, Pick and Place and Home position to move the fingers. The

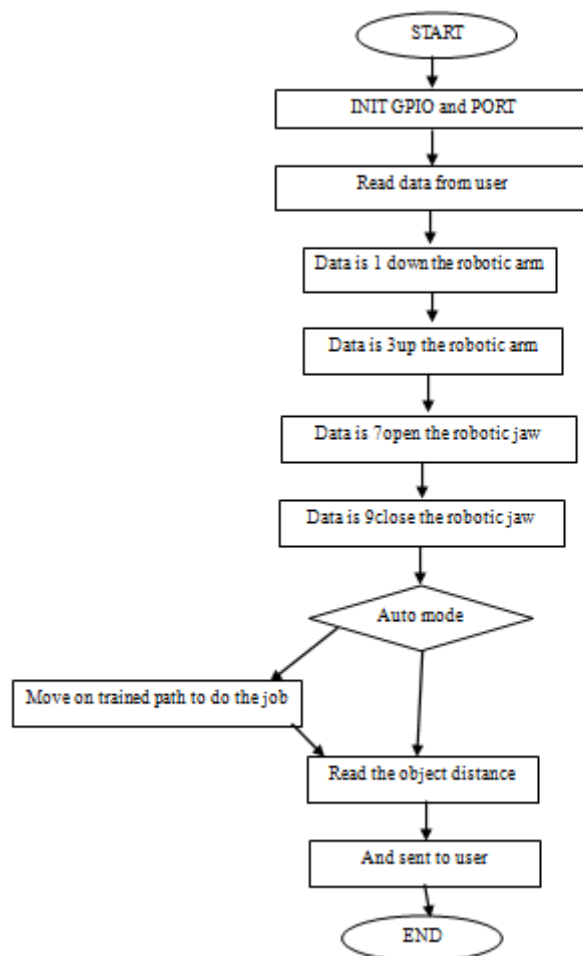
tendering system of the double revolute joint mechanism and wireless feedback network provide the hand with the ability to confirm to object topology and therefore providing the advantage of using a simple control algorithm[4].

R Neeraj et al. The robot is capable of moving forward, backward, leftward, and rightward. The arm is capable of doing the picking and placing actions. An application called, “Arduino Bluetooth controller” is installed on the user’s android device and the commands are given to the robot to pick and place the objects from source or required place to destination place[5].

Avinash N Bhat et al. Robotic manipulators resembling the human arm is known as robotic arms. They are constructed by a structure consisting of structurally robust links coupled by either rotational joints or translating joints. A robotic arm is thus a type of mechanically coupled or joined arm, run by programmable commands, with similar functions to a human arm. It may be the sum total of the mechanism links or may be part of a more complex sized robot[6].

### III.METHODOLOGY

Arduino is an electronic board, which is a type of microcontroller that can control both physically and digitally. Arduino board is embedded with a chip and compiler that can be programmed by c-language. It helps in receiving the input from the user and control the movement of robot[6]. On the robot side, we use an Arduino microcontroller placed on the robot body or chassis, which is an important part of the robot car. Under the chassis, the wheels are connected to DC motors at 30 rpm each. All motors require 12v power from an external battery. The motor interfaces with the Arduino via a relay driver. Four relay drivers are used for two motors and they are used for power generation[7].



3.1 Flowchart of Project

#### IV. EXPERIMENTAL RESULTS

The user can manually control the movement directions of the tank, robotic arm, and camera. In addition, the user can adjust the rotation angles of the robotic arm, camera and display the Real-time video by using Graphical User Interface (GUI) as demonstrated in Fig 4.1.

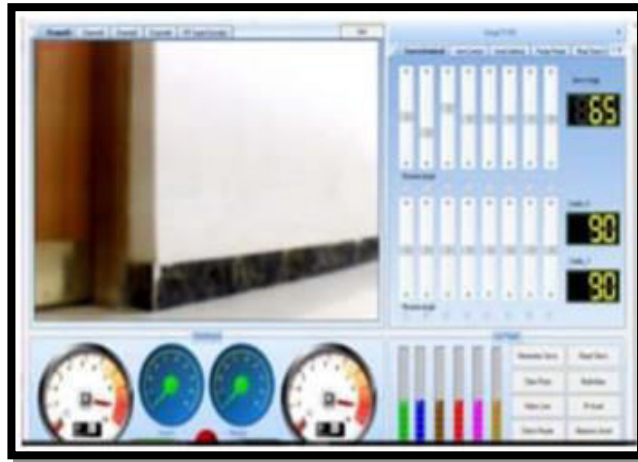
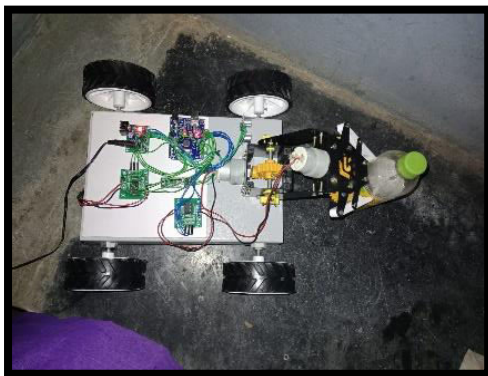
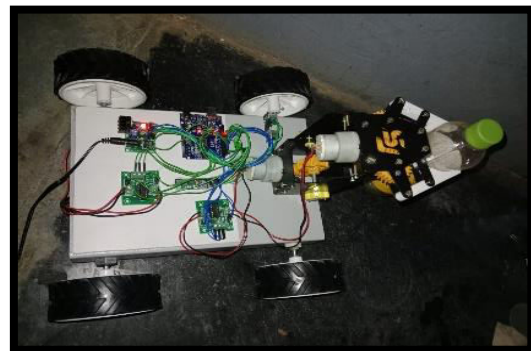


Fig. 4.1: The Graphical User Interface

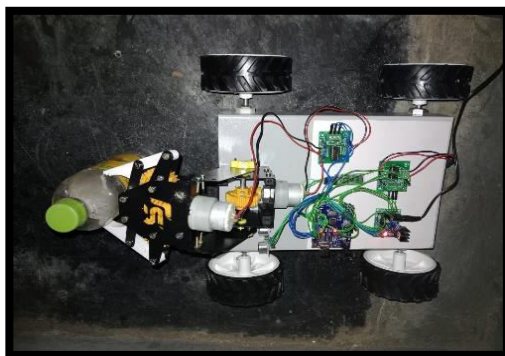
Fig 4.2 illustrates the user controls the robotic tank to pick up the object (bottle) at position A, then placing it at position B between two vases



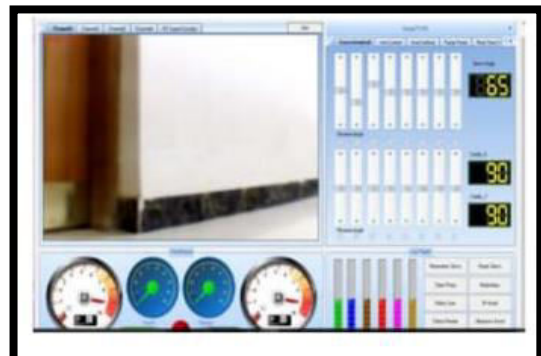
(a): Picking up the bottle from position A



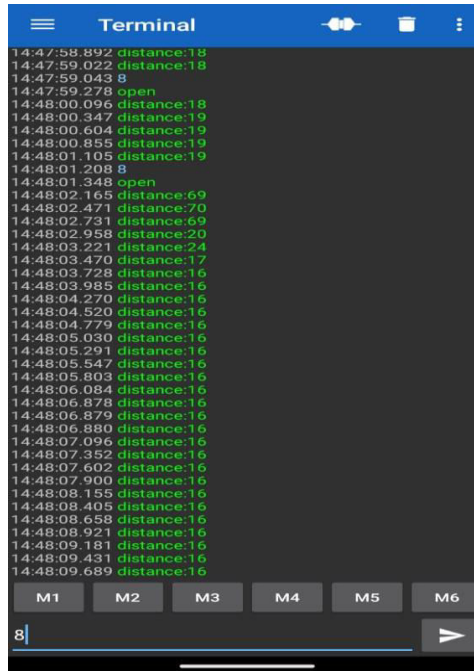
(b) Lifting up the bottle and moving toward position B



(c) Placing the bottle at position B & focussing



(d) Receiving the camera to the left vase.



```

Terminal
14:47:58.892 distance:18
14:47:59.022 distance:18
14:47:59.043 8
14:47:59.278 open
14:48:00.096 distance:18
14:48:00.347 distance:19
14:48:00.604 distance:19
14:48:00.855 distance:19
14:48:01.105 distance:19
14:48:01.208 8
14:48:01.348 open
14:48:02.165 distance:69
14:48:02.471 distance:70
14:48:02.731 distance:69
14:48:02.958 distance:20
14:48:03.221 distance:24
14:48:03.470 distance:17
14:48:03.728 distance:16
14:48:03.985 distance:16
14:48:04.270 distance:16
14:48:04.520 distance:16
14:48:04.779 distance:16
14:48:05.030 distance:16
14:48:05.291 distance:16
14:48:05.547 distance:16
14:48:05.803 distance:16
14:48:06.084 distance:16
14:48:06.378 distance:16
14:48:06.679 distance:16
14:48:06.880 distance:16
14:48:07.096 distance:16
14:48:07.352 distance:16
14:48:07.602 distance:16
14:48:07.900 distance:16
14:48:08.155 distance:16
14:48:08.405 distance:16
14:48:08.658 distance:16
14:48:08.921 distance:16
14:48:09.181 distance:16
14:48:09.431 distance:16
14:48:09.689 distance:16
M1 M2 M3 M4 M5 M6
8

```

Fig. 4.2: Remote controlling the tanker robot via Bluetooth

As shown in Fig 4.3, the coding had been done such that, by using the commands, '1', '2', '3', '4','6','7','8','9', the Moving system moves in the predefined directions Forward, Backward, Left and Right , Robot arm Up & Robot arm Down ,Robot Jaw Open& Robot Jaw Close directions respectively. To stop the Moving system the command '5' is used. The Arduino mega collects all the data which is then coded to be display the data on the pc and smart phone. The segment of the code is shown in Fig 4.3 with comments.

## V. CONCLUSION

The Pick and Place robot is successfully designed and executed in this project. project's goals which included creating the hardware and software for a wireless mobile robotic arm, operating the pick-and-place system, and testing an automaton that complies with the project's requirements have been met. The examination clearly demonstrates that its movement is exact, accurate, simple to regulate, and user-friendly. The wireless control of the arm, mobile, and automaton movement demonstrates the success of the mobile robot's development. This robot should be able to pick up and place dangerous objects quickly and easily, as well as position or pick up objects that are far from the user.

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