

Wireless Pick and Place Robotic Hand for Industrial Applications

Mr. Najeemullah¹, Shoaib Khan², Md. Shahed hussain³, Abu Bakar⁴

¹Assistant Professor Department of ECE, Lords Institute of Engineering and Technology
Hyderabad, India

^{2,3,4,5}Department of ECE, Lords Institute of Engineering and Technology Hyderabad, India

Abstract

- As Robots are used to help mankind in various environments if we combine the Robots and Internet of things we can achieve more than we can think of.
- This project discusses technological implications, open issues, and target applications in the IoT aided robotics domain

Introduction

This robot is used for pick the object from one source and place that objects in the destination. Some industrial works are harmful for humans; these kinds of robots are mainly used to avoid that kind of risk and consuming enough time and avoid labors involved in the work. Humans are tired for hard work such as assembly line, material handling etc. this robot does all those things and it mainly reduces the manual work. This robot is designed at low cost as well as high efficient. This project is to give the way for providing bigger effective robot for industrial applications.

Literature Survey

A literature survey on Wireless pick and place robotic arm shows that .This review paper highlights the various aspects of a robotic arm after reviewing several successful research papers on manipulators. Nowadays, Robotic arms are. being used in industries to minimize the human errors and increase efficiency, productivity, precision of the operations taking place. One of the most important advantages of introducing Robotic arm in Industries is that it can work in crucial conditions like high temperatures, pressures where it's risky for humans to work .Since a manipulator comes under Flexible Automation, they can be updated and modified easily. We have referred several research papers which have been experimentally verified to observe the different types of controllers used and different methodologies used by different authors to decide the degrees of freedom of a manipulator used for the picking of an object and placing it at specified position. Thus, knowledge acquainted after referring all these papers, will help in Designing the Robotic arm

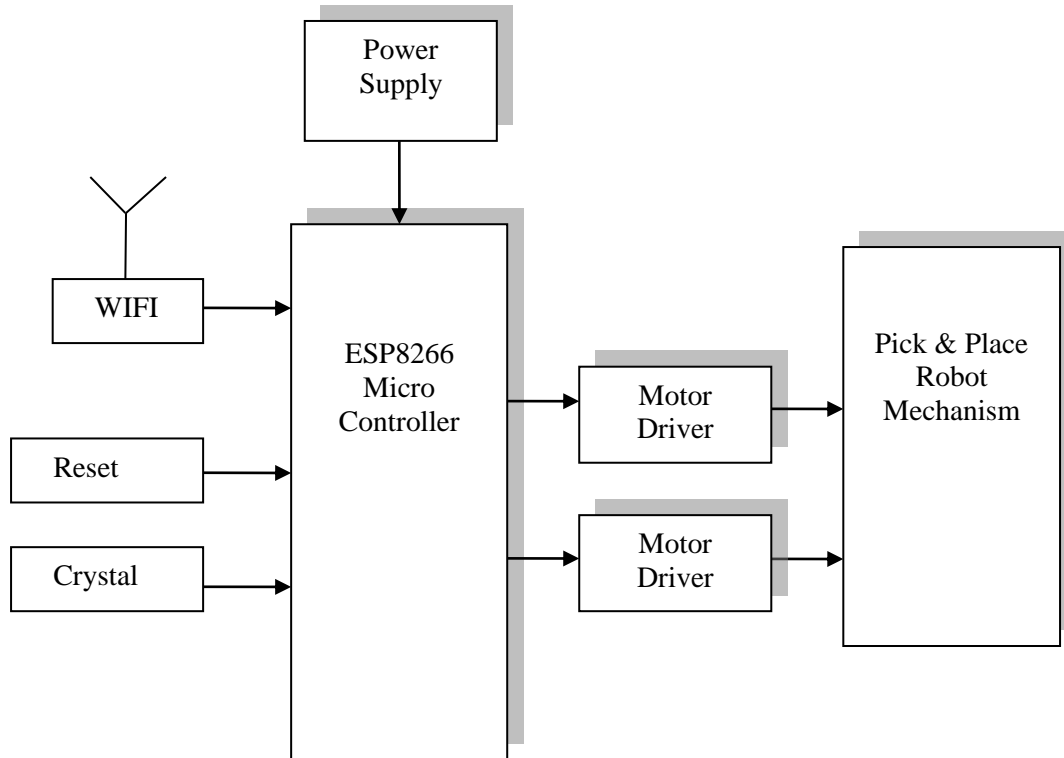
Working Principle

1. The wireless pick and place robotic system on wheels is designed for industrial applications. The robot uses wheels for mobility and is equipped with wireless communication technology that allows it to move freely without the need for cords or cables. The robot has a pick and place arm that is equipped with a gripper that can pick up and place

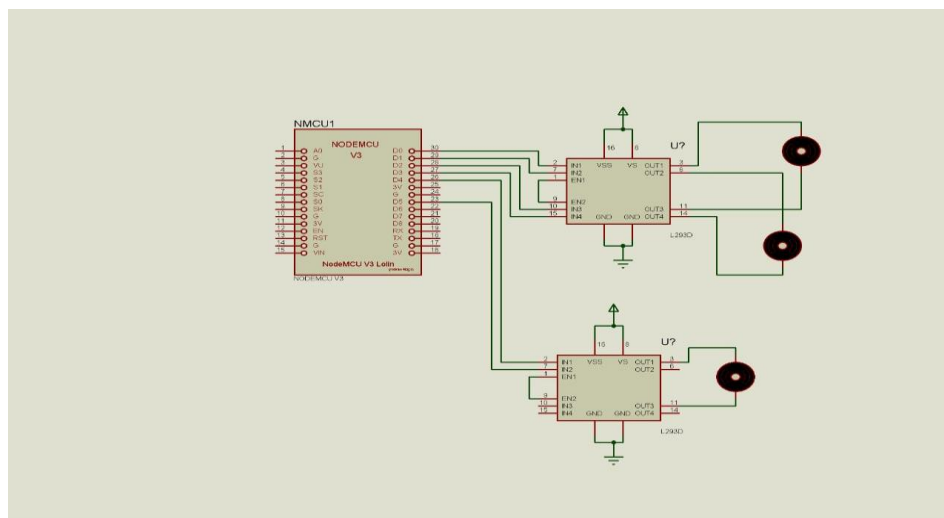
objects of various shapes and sizes.

2. The robot uses sensors to detect the presence of objects and determine the best path for picking them up. It also has an advanced control system that allows it to move precisely and accurately, even in cluttered or narrow spaces. The robot can work in collaboration with other machines or systems, and it can be programmed to perform a variety of tasks, such as picking and placing objects in a specific order or pattern.

Block Diagram



Schematic Diagram



Hardware Description

a. Power Supply

The power supply section is the section which provides +5V for the components to work. ICLM7805 is used for providing a constant power of +5V.

The ac voltage, typically 220V, is connected to a transformer, which steps down the ac voltage down to the level of the desired dc output. A diode rectifier then provides a full-wave rectified voltage that is initially filtered by a simple capacitor filter to produce a dc voltage. This resulting dc voltage usually has some ripple or ac voltage variation.

A regulator circuit removes the ripples and also retains the same dc value even if the input dc voltage varies, or the load connected to the output dc voltage changes. This voltage regulation is usually obtained using one of the popular voltage regulator IC units.

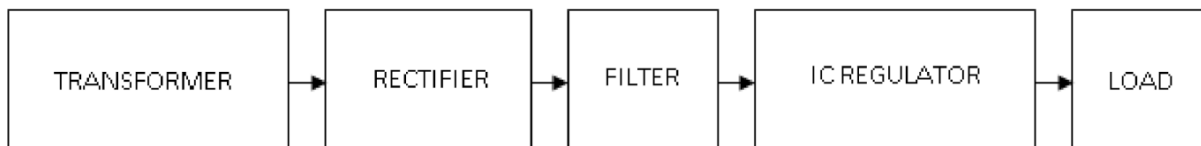
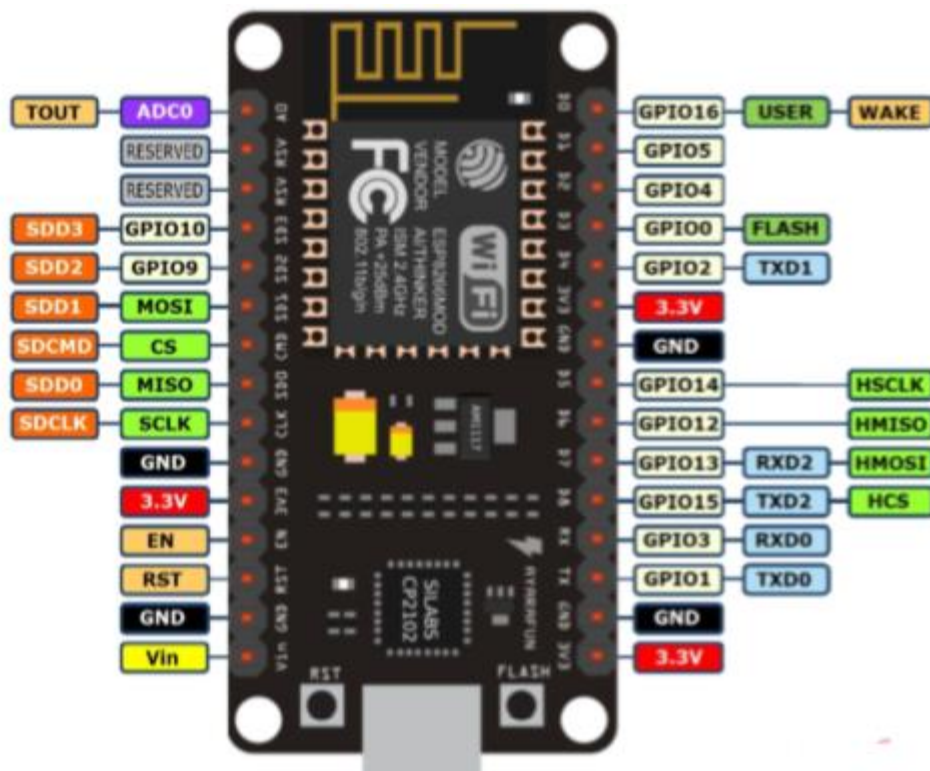


Figure 3.1 Block Diagram of Power Supply

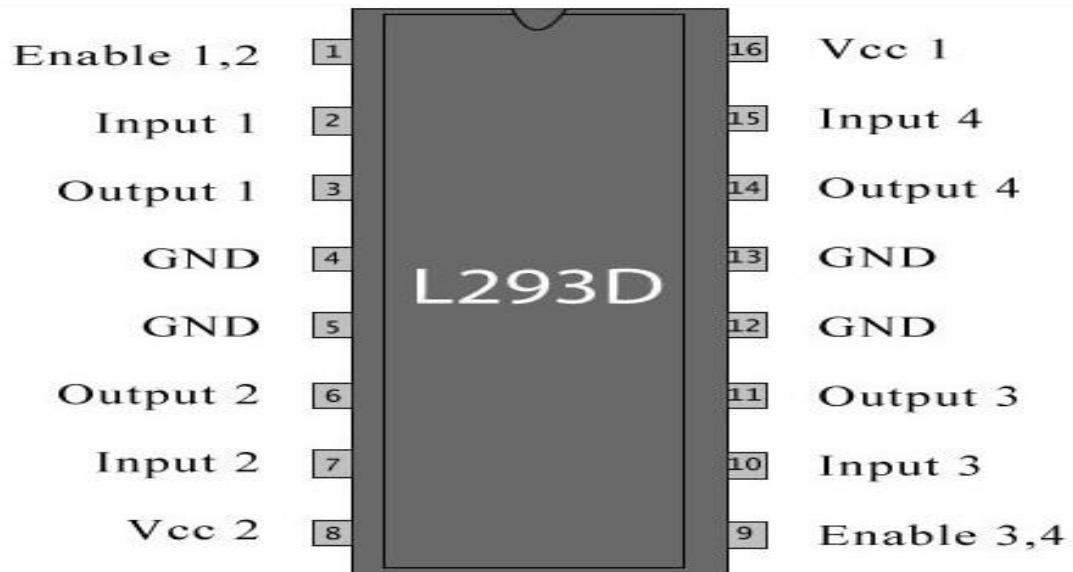
b. ESP8266



ESP8266EX offers a complete and self-contained Wi-Fi networking solution; it can be used to host the application or to offload Wi-Fi networking functions from another application processor. When ESP8266EX hosts the application, it boots up directly from an external flash. It has integrated cache to improve the performance of the system in such applications.

Alternately, serving as a Wi-Fi adapter, wireless internet access can be added to any micro controllerbased design with simple connectivity (SPI/SDIO or I2C/UART interface). ESP8266EX is among the most integrated WiFi chip in the industry; it integrates the antenna switches, RF balun, power amplifier, low noise receive amplifier, filters, power management modules, it requires minimal external circuitry, and the entire solution, including front-end module, is designed to occupy minimal PCB area.

c. L293D



L293D IC generally comes as a standard 16-pin DIP (dual-in line package). This motor driver IC can simultaneously control two small motors in either direction; forward and reverse with just 4 microcontroller pins (if you do not use enable pins).

The 4 input pins for this l293d, pin 2,7 on the left and pin 15 ,10 on the right as shown on the pin diagram. Left input pins will regulate the rotation of motor connected across left side and right input for motor on the right hand side. The motors are rotated on the basis of the inputs provided across the input pins as LOGIC 0 or LOGIC 1.

In simple you need to provide Logic 0 or 1 across the input pins for rotating the motor.

d .BO DC MOTOR

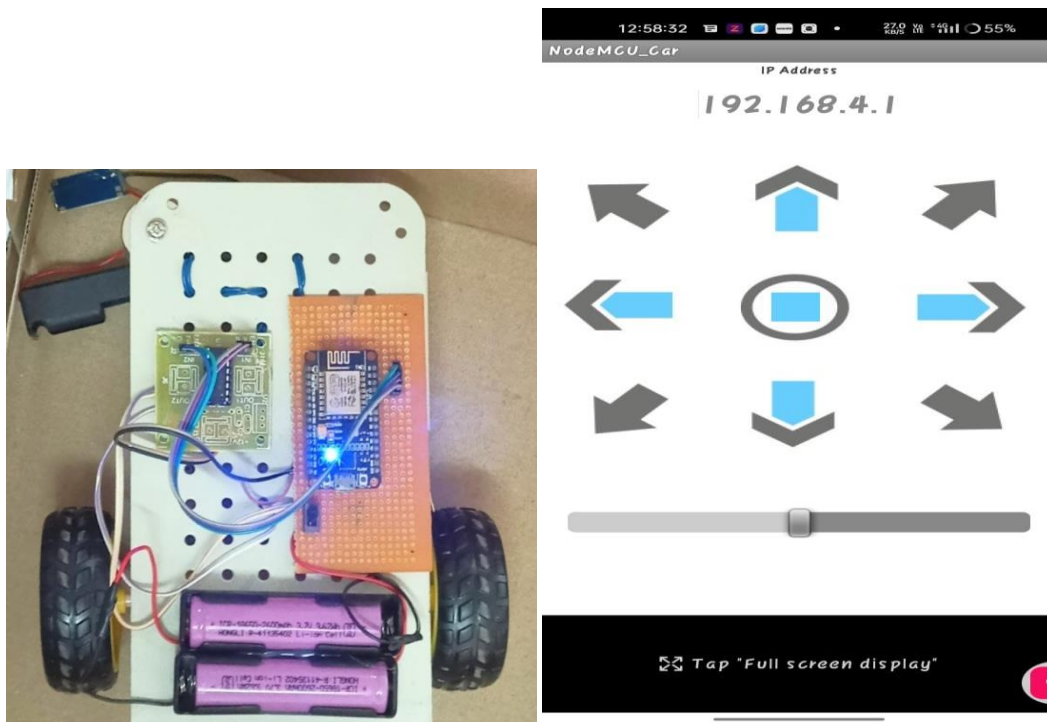
A DC motor is designed to run on DC electric power. Two examples of pure DC designs are Michael Faraday's homopolar motor (which is uncommon), and the ball bearing motor, which is (so far) a novelty.

By far the most common DC motor types are the brushed and brushless types, which use internal and external commutation respectively to create an oscillating AC current from the DC source—so they are not purely DC machines in a strict sense.

We in our project are using brushed DC Motor, which will operate in the ratings of 12v DC 0.6A which will drive the flywheels in order to make the robot move.



Result & Discussion



Conclusion

.The project “**WIRELESS PICK AND PLACE ROBOTIC HAND FOR INDUSTRIAL APPLICATIONS**” has been successfully designed and tested. It has been developed by integrating features of all the hardware components used. Presence of every module has been reasoned out and placed carefully thus contributing to the best working of the unit. Secondly using highly advanced IC’s and with the help of growing technology the project has been successfully implemented.

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