e-ISSN: 2582-5208
International Research Journal of Modernization in Engineering Technology and Science
(Peer-Reviewed, Open Access, Fully Refereed International Journal)
Volume:04/Issue:06/June-2022 Impact Factor- 6.752 www.irjmets.com

CLOUD ROBOTIC FOR INDUSTRY PURPOSE USING NODEMCU

T. Nikhil[*1], D. Pravani[*2], D. Harsha[*3], P. Kiran Kumar[*4]

[*1,2,3]Jntuh, Electronic And Communication Engineering, Ace Engineering College, Hyderabad, Telangana, India.

[*4]Assistant Prof, Department of Electronics and Communication Engineering, ACE Engineering College, Hyderabad, Telangana, India

ABSTRACT

Cloud robotics is a field that attempts to invoke cloud technologies such as cloud computing cloud storage and other internet technologies centered on the benefits of converged infrastructure and shared services for robotics. Our project is a cloud robot which is used in industrial and manufacturing environment. Here we use NodeMcu controller to control the various devices attached to it. For testing this implementation android phone, camera, dc motors, sensors and a nodemcu controller have been used. The movement of the robot is provided by dc motors and the direction is controlled from an android mobile or cpu. The controller and the receiver end is connected by wi-fi. The data input from the gas, temperature and infra-red sensors is given to nodemcu controller. A camera is used to provide visual input of the surrounding environment to the robot. The data obtained by the sensors and camera are processed by the controller and stored in cloud.

I. INTRODUCTION

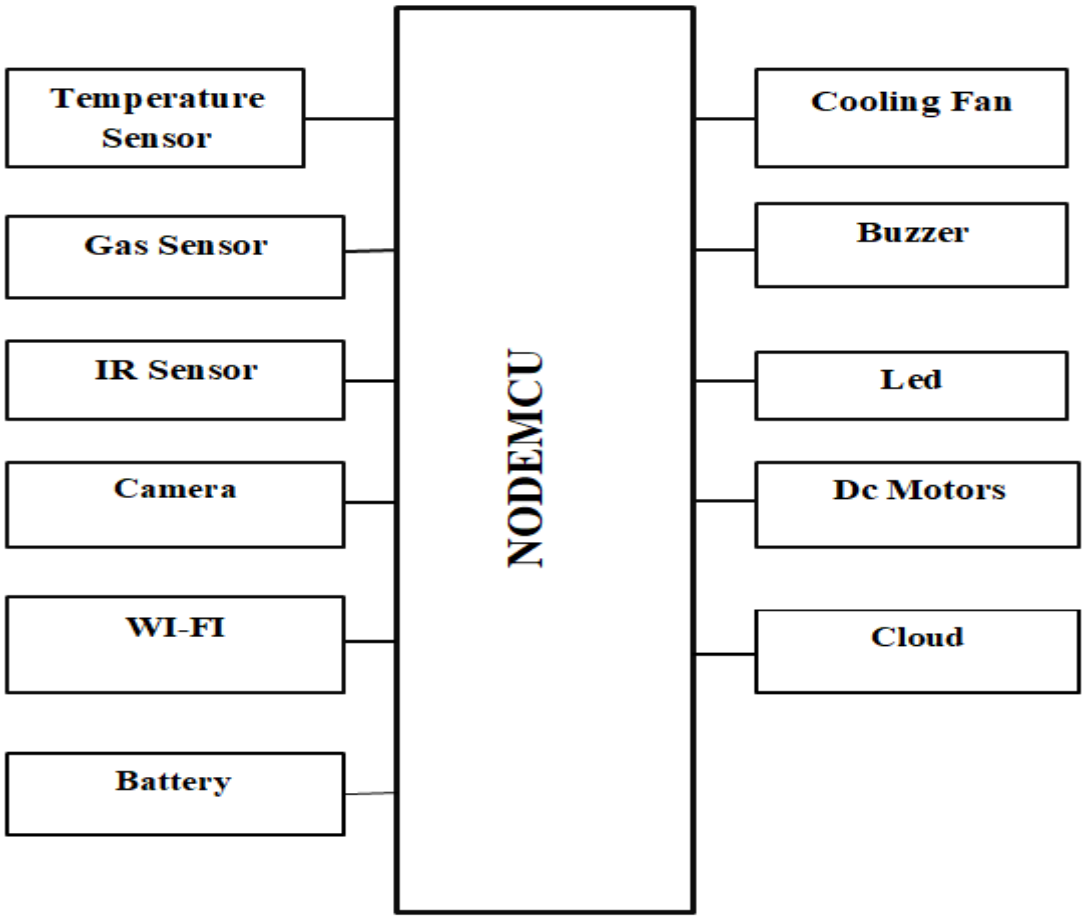
Cloud robotics is an emerging field that merges the concepts of cloud technologies and service robot. It is a disruptive technology based on the advantages of rapid fall in cost of servers, data centers and broadband access inexpensive cloud storage. Internet is used to complement the capabilities of the robots by relieving them from on board computation intensive. Within the advance in technology a new era area cloud robotics has evolved from conventional robotics which can create a wide impact in industrial areas. When connected to the cloud robots can be benefit from the powerful computational storage and communication resources of modern data center in cloud which can process and share information. The aim is to construct a robot with alert systems and sensors which works within the cloud.

II. METHODOLOGY

Robotic is a technology that deals with design construction and application of robot as well as computer system for their control and processing information. We have constructed a robot that can move and monitor the entire industry. The movement is provided by the dc motor. A DC motor is a electrical motor that converts the electrical energy into mechanical power. A DC motor speed can be controlled over a wide range using either a variable supply or by changing the field windings. Wheeled motors are more efficient and easy to control. The motor is controlled by the NodeMcu controller. NodeMcu is an open source hardware and software environment built chip. Temperature sensor DHT11 is a humidity and temperature sensor. The sensor comes with a dedicated NTC to measure temperature. If temperature levels increases above the threshold levels the controller switches on the fan. And brings the temperature to normal. IR sensors are miniaturized IR receiver modules for remote control systems. IR sensor signals if a person is trying to cross a restricted area and switches on the lamp and buzzer. Gas sensor is used to detect the gas leakage. If gas levels cross above the minimum then switch on the buzzer to the alert the workers. The camera ESP32 feeds or streams its image to a computer or a mobile using network when captured by the computer video stream may be saved viewed via WI-FI. The power supply for all the components is provided by battery. As a vehicle operates 12v DC.

e-ISSN: 2582-5208
International Research Journal of Modernization in Engineering Technology and Science
(Peer-Reviewed, Open Access, Fully Refereed International Journal)
Volume:04/Issue:06/June-2022 Impact Factor- 6.752 www.irjmets.com

BLOCK DIAGRAM:

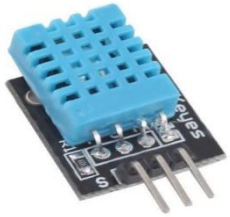


III. MODULES OF THE PROJECT

NodeMcu

The NodeMcu is a open-source software and hardware development environment built around system on a chip called the ESP8266. The ESP8266 designed in such a way that crucial elements of a computer CPU, RAM, WI-FI and even a modern operating system ans SDK.

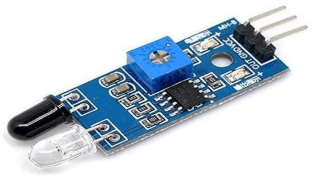
Temperature Sensor:



The DHT11 is a commonly used temperature and humidity sensor. The sensor comes with a delicated NTC to measure temperature and an 8-bit microcontroller to output the values of temperature as serial data. The sensor can measure temperature from 0 degree to 60 degree. And humidity from 20% to 90%.

e-ISSN: 2582-5208
International Research Journal of Modernization in Engineering Technology and Science
(Peer-Reviewed, Open Access, Fully Refereed International Journal)
Volume:04/Issue:06/June-2022 Impact Factor- 6.752 www.irjmets.com

IR sensor:



IR is invisible to the human eye as its wavelength is longer than that of visible light. Anything that's emits heat gives off infrared radiation. IR led is one kind of transmitter that emits radiation. These infrared receivers are available in photodiode form.

Gas Sensor:

MQ6 is one of the commonly used gas sensors. It is a metal oxide semiconductor type gas sensor also known as chemiresistors. MQ6 gas sensor works on 5Dc and draws around 800mW. Detects LPG, smoke, Alcohol, propane, hydrogen, methane and carbon monoxide concentrations anywhere from 200 to 10000ppm.

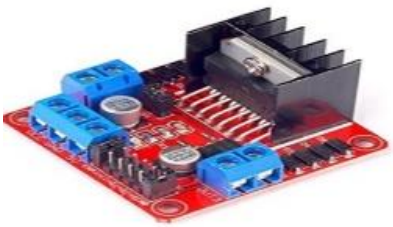
Cooling Fan:

This brushless DC Cooling fan are operating at 12v. The fan spins at 2600 RPM and can move approximately 30CFM.

Buzzer:

An audio signaling device like a beeper or buzzer main function of this is to convert the signal from audio to sound. It is provided through DC voltage and used in timers, alarm devices, etc. Based on the various design it can generate different sound.

L298DA Motor Driver:



This L298 Based motor driver module is a high power motor driver perfect for driving DC motors. It uses the popular L298 motor driver IC and has the onboard 5V regulator which it can supply to an external circuit. It can add upto 4DC motors or 2DC motors with directional and speed control. This motor driver is perfect for robotics and perfect for controlling motor from microcontrollers etc.

e-ISSN: 2582-5208
International Research Journal of Modernization in Engineering Technology and Science
(Peer-Reviewed, Open Access, Fully Refereed International Journal)
Volume:04/Issue:06/June-2022 Impact Factor- 6.752 www.irjmets.com

ESP32 Camera and WI-FI Module:

ESP32 is a low cost ESP32 based development board with onboard camera, small in size. The board integrates WI-FI traditional Bluetooth and low power. It adopts 7 stage pipleline architecture on chip sensor, temperature sensor and so on and its main frequency adjustments range from 80MHz to 240MHz.

Battery:

This device can be called as chemical voltage source is one of the most important sources of electrical energy. It is a self contained voltage source and does not need any outside energy. When the battery is discharged it is supposed to be charged with suitable power source either from main supply. As the vehicle operates at 12V DC here 12V DC rechargeable battery is used.

LED:

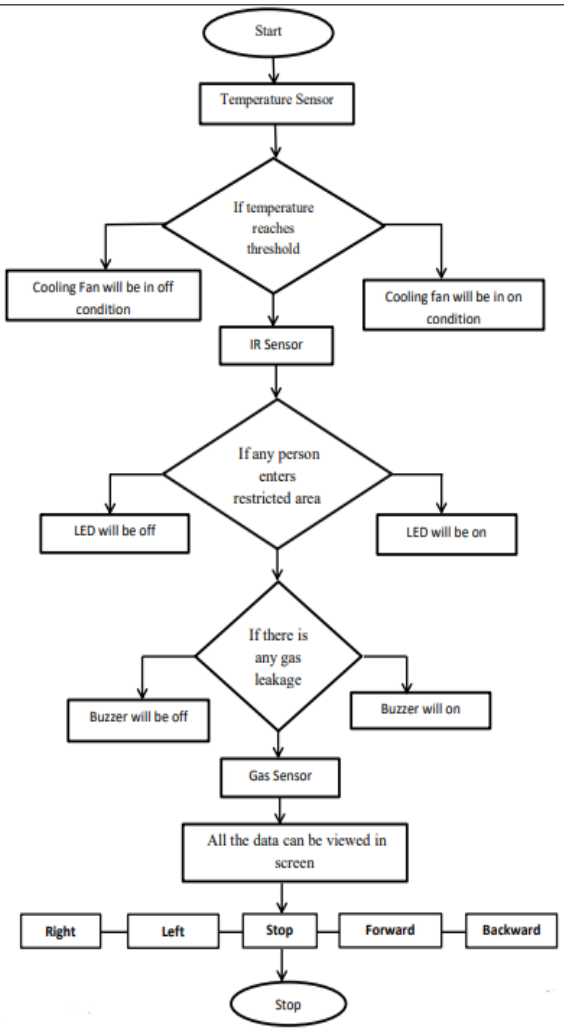
The lighting emitting diode is a p-n junction diode. It is a specially doped diode and made up of special type of semiconductors. When the light emits in the forward biased then it is called a light emitting diode.

DC Motor Control:

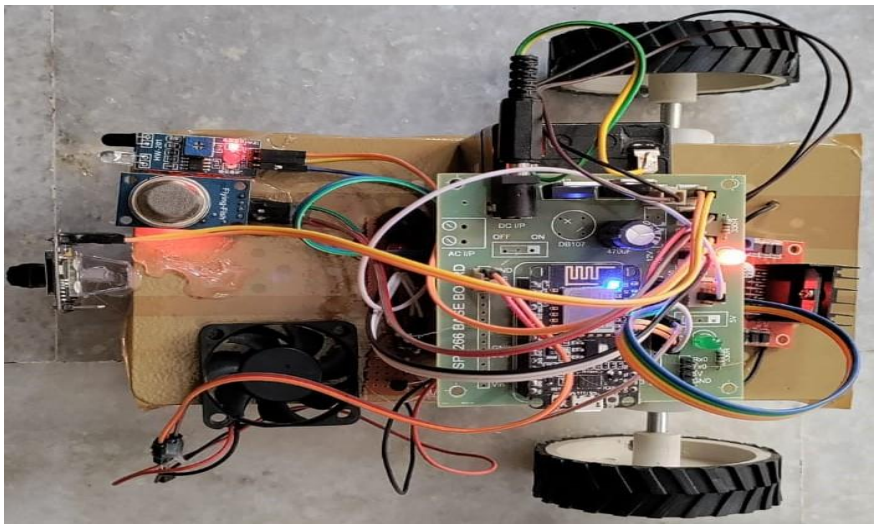
Control for the two motors in the system is carried out by using the L298D integrated circuit H bridge a microcontroller enable and disable the motor excitation elements using the internal H bridge in the circuit. The direct control using pulse width modulation to on/off and speed control for motors.

e-ISSN: 2582-5208
International Research Journal of Modernization in Engineering Technology and Science
(Peer-Reviewed, Open Access, Fully Refereed International Journal)
Volume:04/Issue:06/June-2022 Impact Factor- 6.752 www.irjmets.com

IV. FLOW CHART



V. RESULT



VI. CONCLUSION

In this project we have successfully achieved the design and development of a working model that can make monitoring and securing an easy job inside the industry. This cost efficient robot can save lot of man power and also provide accurate database of all the data obtained from inside the industry.

ACKNOWLEDGEMENT

We are grateful to our guides Prof.B.GIRI RAJU and Assistant Prof. Mr.P.Kiran Kumar for their continuous support and guidance. Through their guidance, we were able to successfully complete our project. Sincere thanks go to Dr.P.SATISH KUMAR, Head of the department of Electronic and Communication Engineering at Ace Engineering College, for his support and time.

VII. REFERENCES

[1] G. S. Bastos, C. H. C. Ribeiro, and L. E. de Souza, "Variable utilityin multi-robot task allocation systems," in Robotic Symposium, 2008.LARS'08. IEEE Latin American. IEEE, 2008, pp. 179–183

[2] L. Turnbull and B. Samanta, "Cloud robotics: Formation control of amulti robot system utilizing cloud infrastructure," in Southeastcon, 2013Proceedings of IEEE. IEEE, 2013, pp. 1–4.

[3] J. Kerr and K. Nickels, "Robot operating systems: Bridging the gap between human and robot," in System Theory (SSST), 2012 44th Southeastern Symposium on. IEEE, 2012, pp. 99–104.

[4] S. Cousins, "Exponential growth of ros [ros topics]," Robotics & Automation Magazine, IEEE, vol. 18, no. 1, pp. 19–20, 2011.