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## Bahubali- The unmanned robotic system

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### ABSTRACT

*Robots in the present scenario play a major role not only in the daily industrial operation but are used majorly in the field of defense, medicals, industries and home applications. BAHUBALI-An unmanned robotic arm is a form of a programmable mechanical arm, which performs functions similar to a human arm. It has multiple useful sensors for carrying out different operations; this robotic arm may be taken together for a single mechanism or may be part of a more complex system. The robotic system that is connected by joints allows rotational motion and translational motion.*

*The major catching point of this robotic arm which makes it different from other arm is its connectivity with Internet which provides it a huge range of control. IOT is an ecosystem of connected physical objects that are accessible through the internet. The 'thing' in IoT could be a person with a heart monitor or an automobile with built-in-sensors, i.e. objects that have been assigned an IP address and have the ability to collect and transfer data over a network without manual assistance or intervention. The embedded technology in the object helps them to interact with internal states as well as the external environment, which in turn affects the decisions taken.*

*The purpose of this robot is to automate the industries on the moving wheels with the working and strong robotic arm providing some automatic systems.*

**Keywords:** *The robotic arm, IoT, Sensoring system, Mobility, etc.*

### 1. INTRODUCTION

Our project aims to provide a moving and iot controlled Robotic arm equipped with some sensing technologies. The sensing technologies such as PIR Sensor (motion detectors) and DHT11 Sensors (temperature and humidity sensor). The values and data recorded by sensors can be read and collected on any device which has internet connectivity.

The basic idea behind this robotic arm is to create a strong, movable and programmable arm which can carry heavy industrial weights or can do any such work which is beyond the tendency of a human being.

The Arduino microcontroller is used for interfacing of temperature and humidity sensor to get real-time readings. Now, this is where our robotic arm becomes different from any other robotic arm, as BAHUBALI itself has a sensing technology which can provide us with data at any moment and at any place.

NodeMCU the open source IoT platform now operates the movement of motors through a motor driver i.e. L293d. This robotic arm on wheels can be easily operated by any Android devices and computers also. It provides a good user interface for handling the vehicle-cum-robotic arm.

The robotic arm has a good controlling range i.e. a good communication range with the help of internet connectivity.

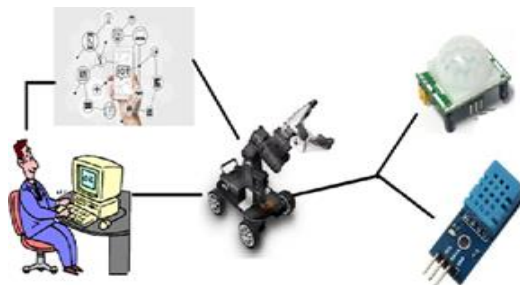
Further the project can be enhanced according to the need of the application. Such as camera technology, cameras can be installed in such robotic arm for efficient spying or surveillance.

The Wi-Fi technology used in the project enhances its connectivity and BAHUBALI can be easily controlled from any web server. This technology has an advantage over long communication range as compared to any other communication methods.

**1.1 Software/Language used:**

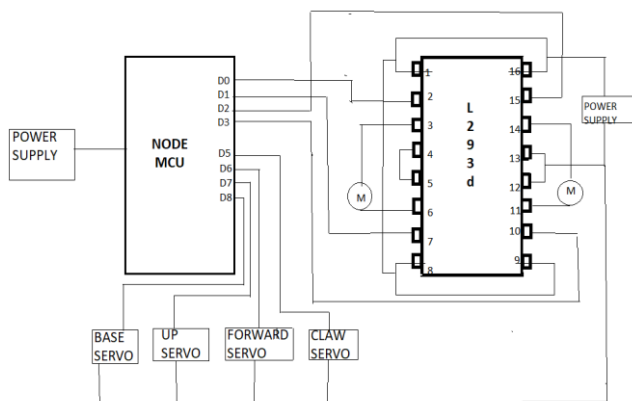
- Embedded C or assembly level language
- Arduino IDE

**1.2 Block Diagram:**



**Chart-1 connectivity using the Internet**

**1.3 Circuit Diagram:**



**Chart-2 complete circuit diagram**

**Table-1: Hardware Used**

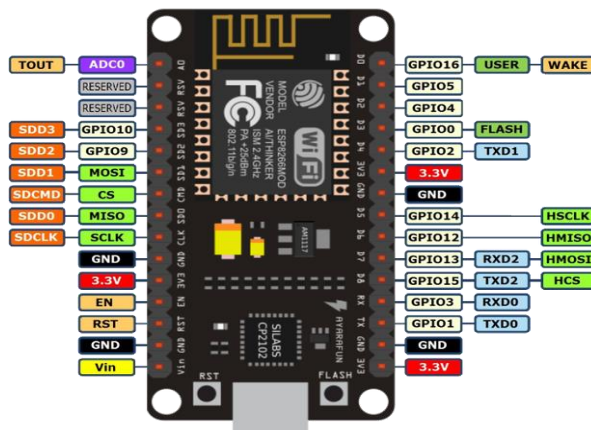
Sr.No.	Components name
1.	NodeMCU
2.	The L293D motor driver IC
3.	Arduino
4.	PIR sensor
5.	DHT11 sensor
6.	DC motors
7.	Servo Motors
8.	Blynk Application
9.	Bread Board
10.	Connection Wires
11.	Base Model

### 1.4 Components Description:

#### 1.4.1 NodeMCU:

An open-source IOT platform which includes firmware that runs on the ESP8266 Wi-Fi SoC from espressif system and the hardware is ESP -12 module.

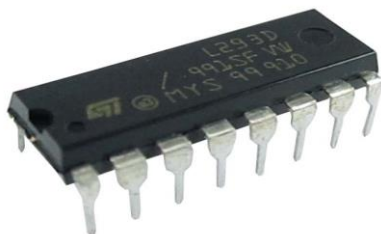
DEVELOPER: ESP8266 (open source community)  
 TYPE: Single-board microcontroller  
 OPERATING SYSTEM: XTOS  
 CPU: ESP8266  
 MEMORY: 128kbytes  
 POWER: USB



#### 1.4.2 L293D IC:

It is a dual H-Bridge motor drive IC, the motor drives generally are current amplifier because they take low current control signal and provide a higher current signal.

Their basic function is to drive the motor.



#### 1.4.2 PIR sensor:

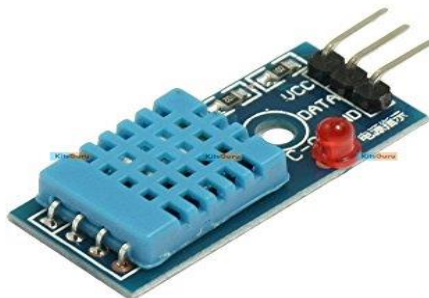
PIR sensor is used to detect motion and also called as PIR sensor. It easily interfaces able with a microcontroller. It provides an alert when any kind of motion detected.

The passive infrared sensor basically measures the infrared radiations that are emitted by the body in the field of view. In the presence of human IR energy or radiation, the infrared sensor detects the energy and immediately converts it into minute electrical pulses, enough to activate the transistor into conduction and to make its collector go low. It contains three pins as one to provide data and other two for power supply.



#### 1.4.2 DHT11 sensor:

DHT11 is a humidity and temperature sensor; it is used to generate calibrated digital output. DHT11 is a form of electronic sensor that can be used to interface with any type of microcontrollers such as Arduino, Raspberry Pi and many more, to get instantaneous results. This electronic sensor is a low-cost humidity and temperature sensor which provides high reliability and long-term stability.



#### 1.4.2 Servo Motors:

A servo motor is actually an assembly of four things: a normal DC motor, a gear reduction unit, a position sensing device and a control circuit. A DC motor is connected to a gear mechanism which provides feedback to a position sensor which is mostly a potentiometer. Servo motor controlling is easy therefore very suitable for our project to precisely control the movement of the robotic arm.



### 1.5 Application and future scope:

Our project is a prototype of a big and strong robotic arm; following applications are possible for this robotic arm:

- 1) Arms for automotive manufacturing and processing with real-time temperature and humidity readings.
- 2) Surgical arms in medical sciences.
- 3) Prosthetic arms like rover arms for unmanned systems in space research organizations.
- 4) Every day moving mechanical arms with alarming systems used as theft control.
- 5) Helps in carrying out operations in hazardous environments.

The following points elaborate the future scope of this project:

- 1) The controlling through IOT makes it available to use it anywhere without our presence.
- 2) The camera will be provided for surveillance Systems in defense.
- 3) Controlling with the help of camera and mobile make it available to run anywhere to collect samples from soils.

## 2. CONCLUSION

The project BAHUBALI is the unmanned arm which is a prototype of a strong robotic arm which is most importantly an IOT based project which makes it very reliable and flexible.

The project has sensing technology such as motion sensor, temperature sensor, and humidity sensor which makes it more helpful in the field of industry.

The block diagram shown above explains the interconnectivity of network which the project offers due to the presence of internet of things.

Basically, the project is best suited for industries and areas of devastations or any such place where the human arm is not suitable to work. The preciseness of a robot and the strength of its arm make BAHUBALI unique in every sense.

### **3. ACKNOWLEDGEMENT**

Our project would not have been possible without the guidance of Prof. ANNU GOVIND (Associate professor, EN department, IMS Engineering College, U.P. India) faculties, lab assistants of EN department, IMSEC for their technical support and constant supervision which contributed immensely to project development. I also thank for their guidance which has a remarkable force that enabled me to successfully complete the project program. They helped and coached us during our project by giving us feedback and tips on how to handle and approach situations. Last but not least, special thanks to all my friends for sharing their experiences, time and commitment especially during finishing of the project.

### **4. REFERENCES**

- [1] Embedded Systems: Architecture, Programming and Design by Raj Kamal
- [2] <https://www.instructables.com/id/Internet-Controlled-LED-Using-NodeMCU/>
- [3] <http://www.instructables.com/id/EEZYbotARM/>
- [4] "Surveillance Robot for Real-Time Monitoring and Capturing Controlled Using Android", Mobile Middle-East Journal of Scientific Research (24 (S1): 155-166, 2016).