

Robot for Disaster Management

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Abstract

The paper focuses on a Robot which is useful for disaster management. After a major disaster, there many regions which are unreachable and hence are left untouched. At those times it is not sensible for humans to go in, as they are highly accident prone. Hence a smart instrument with manageable size should go and hence not risk any lives. Robot is an electro – mechanical instrument which is guided by other electronic device with the help of some codes and programs.

• INTRODUCTION

In the era of artificial intelligence, every other task is possible thanks to technology. It has now become easier to reach out to dangerous places, which was unthinkable few decades back. Hence the idea which has been presented here is of new kind because of the use of Arduino. Therefore the whole system becomes cost effective.

• CONSTRUCTION

The robot has Arduino as its major component which helps in sensing various aspects of the surrounding. It has various components attached to it which makes it a multifunctional in nature. The major components are listed down below:

- ARDUINO UNO- The major component of this robot system is the Arduino. Arduino is an open source software hardware system. There are many different types of Arduinos available in the market, but Arduino UNO has been used in this particular project. Arduino boards have various microprocessors and controllers attached to it. The board is equipped with various input-output ports.



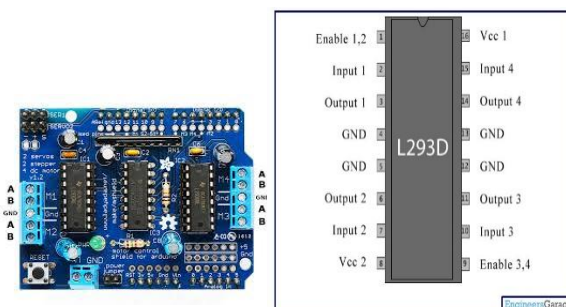
- DISTANCE SENSOR- The robot has a distance sensor helps to detects obstacle at a particular distance and hence retreats back which helps it to avoid collision. The distance sensor works very accurately, it has easy setup and low-cost integration. It functions very easily, initially it emits a signal and when an obstacle comes in its way, it strikes back the signal hence measuring the distance of from the distance sensor to the obstacle. It basically four ports amongst which one is for transmission and another one is for reception.



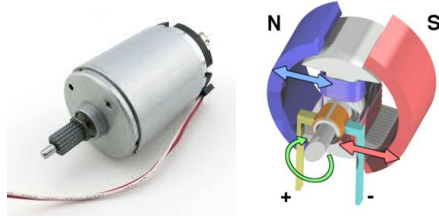
- HC05- A HC05 is a very easy to use Bluetooth module. By using this Bluetooth module, we can connect any device which has Bluetooth connectivity to the robot which helps to control its movements (forward, backward or sideward). With the help of this module we can very affectively operate the robot using our cell phones.The HC05 Bluetooth module uses CSR Blue core 04-External single chip Bluetooth system with CMOS technology and with AFH (Adaptive Frequency Hopping Feature).



- L293D (MOTOR SHIELD) – The robot system has a motor shield l293d for its coordinated motion.The motor shield makes it possible to move the robot in desired direction i.e. forward,backward and sideward. L293d is actually a dual H-bridge motor driver integrated circuit. Using the IC, the motor shield is made for proper, better and neat connections.



- DC MOTOR – Any mechanical movement visible in the Robot is due to the DC motor installed in it. A DC motor is a rotatory electrical machine which helps in converting electrical energy from the power supply to mechanical form.



- **WORKING**

The working of this system comprises of its movements which are driven by the codes embedded. The system will move with the help of control which is Smartphone (Bluetooth device) in case of the prototype. Movements consist of:

- Forward
- Backward
- Sideward in the Bluetooth range.

As the system approaches any obstacle it will stop at a distance of 6 inches from it. After it stops the remote control will be disabled from any forward movement. As described in the construction part the system consists of two motors: left and right respectively. For the system to move forward it is needed to enable the positives of both the motors hence disabling the negatives. While for backward movement exact opposite action is required. For the system to move in right, left motor needs to move in forward direction while right motor in backward direction which means that positive of left motor is enabled hence disabling the negative and vice versa with the right motor. Again, for the system to move in left direction, left motor needs to move backward while right one to forward. Therefore, negative of left motor is enabled disabling the positive and vice versa with right motor. The coding of this system is done on the basis of above mechanism.

- **DISASTER MANAGEMENT (FUTURE EXPANSION)**

Disaster management will be under the future expansion. As we will be attaching the Wi-Fi module to it along with a camera so that it can go to places which is beyond human reach and can find people who are buried under debris caused due to the natural disaster. For instance after an earthquake there is a lot of debris caused which leads to chaos regarding people who are buried in the debris. Many lives are lost as people are alive in there but we can't find them due to its insurmountable reach. It will be definitely useful and is for noble cause. It is cost effective due to the use of Arduino which is an affordable microprocessor. And with the use of Arduino it is one of a kind.

- **REFERENCES**

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