

ALL-TERRAIN VEHICLE USING ARDUINO AND BLUETOOTH

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Abstract - The objectives of this design and analysis of an ATV fun to drive, versatile, safe, durable, and high performance off road vehicle. We have to ensure that the vehicle spastics the limits of set rules. This vehicle must be capable of negotiating the most extreme terrain with confidence and ease. They can be used as service robots, for the purpose of household work and so many other indoor applications. Equally they have great importance in scientific exploration and emergency rescue, there may be places that are dangerous for humans or even impossible for humans to reach directly.

Key Words: All-Terrain Vehicle, off road vehicle.

1. INTRODUCTION

In this project we use the Arduino controlled all-terrain vehicle which is very much used in the prone areas where humans cannot reach. This simple all-terrain vehicle is controlled by mobile application. The communication between the bot and the mobile is enabled with Bluetooth module, which has the communication range of 10-15 meters. Though it is an all-terrain vehicle the design of the bot quiet heavy with chassis. The wheels controlled by the geared dc motor which connected to the motor driver with the ability to control up to 4 motor.

1.2 PROPOSED SYSTEM

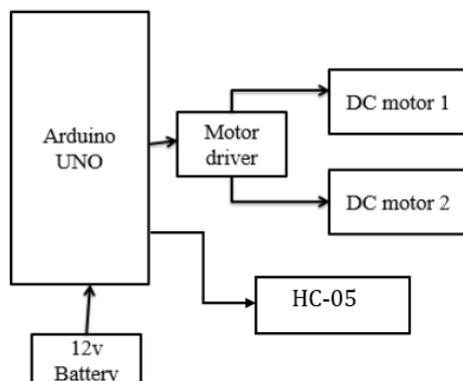


Fig- 1: Proposed diagram

2. MATERIALS AND METHODS

Here we used hardware components like Arduino UNO, DC motors, Battery, Motor driver, Chassis and one software to write command program called Arduino IDE.

2.1 ARDUINO UNO

The Uno differs from all preceding boards in that it does not use the FTDI USB-to-serial driver chip. Instead, it features an ATmega16U2 programmed as a USB-to-serial converter. This auxiliary microcontroller has its own USB boot loader, which allows advanced users to reprogram it. The Arduino Uno R3 is a microcontroller board based on a removable, dual-inline-package (DIP) ATmega328 AVR microcontroller. It has 20 digital input/output pins (of which 6 can be used as PWM outputs and 6 can be used as analog inputs). Programs can be loaded on to it from the easy-to-use Arduino computer program. The Arduino has an extensive support community, which makes it a very easy way to get started working with embedded electronics. The R3 is the third, and latest, revision of the Arduino Uno. There are many varieties of Arduino boards that can be used for different purposes. Some boards look a bit different from the one below, but most Arduino have the majority of these components in common.

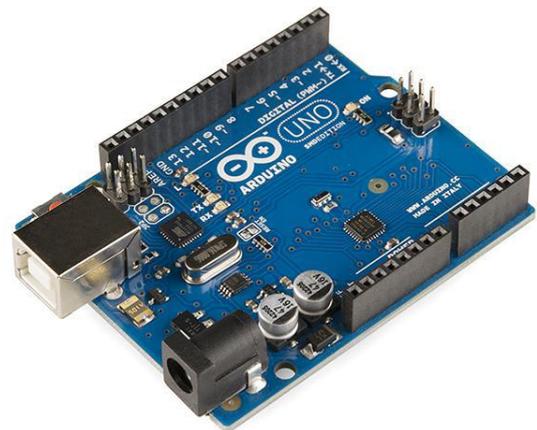


Fig-2: Arduino UNO

2.2 DC MOTOR

Geared DC motors can be defined as an extension of DC motor which already had its Insight details demystified here. A geared DC Motor has a gear assembly attached to the

motor. The speed of motor is counted in terms of rotations of the shaft per minute and is termed as RPM. The gear assembly helps in increasing the torque and reducing the speed. Using the correct combination of gears in a gear motor, its speed can be reduced to any desirable figure. This concept where gears reduce the speed of the vehicle but increase its torque is known as gear reduction. This Insight will explore all the minor and major details that make the gear head and hence the working of geared DC motor.



Fig-3: DC motor

2.3 MOTOR DRIVER

The L298N is an integrated monolithic circuit in a 15-lead Multiwatt and PowerSO20 packages. It is a high voltage, high current dual full-bridge driver designed to accept standard TTL logic level and drive inductive loads such as relays, solenoids, DC and stepping motors. Two enable inputs are provided to enable or disable the device independently of the input signals. The emitters of the lower transistors of each bridge are connected together and the corresponding external terminal can be used for the connection of an external sensing resistor. An additional supply input is provided so that the logic works at a lower voltage.

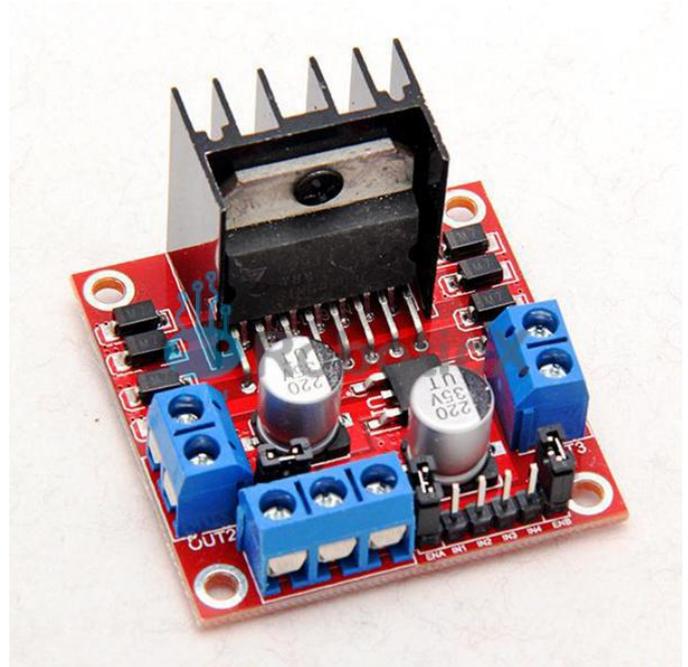


Fig-4: L298N Motor driver

2.4 Battery

All lead acid batteries consist of flat lead plates immersed in a pool of electrolyte. Regular water addition is required for most types of lead acid batteries although low-maintenance types come with excess electrolyte calculated to compensate for water loss during a normal lifetime. Lead acid batteries used in the RV and Marine Industries usually consist of two 6-volt batteries in series, or a single 12-volt battery. These batteries are constructed of several single cells connected in series each cell produces approximately 2.1 volts. A six-volt battery has three single cells, which when fully charged produce an output voltage of 6.3 volts. A twelve-volt battery has six single cells in series producing a fully charged output voltage of 12.6 volts. A battery cell consists of two lead plates a positive plate covered with a paste of lead dioxide and a negative made of sponge lead, with an insulating material (separator) in between.

2.5 ARUDINO IDE

The Arduino Integrated Development Environment (IDE) is a cross-platform application (for Windows, macOS, Linux) that is written in functions from C and C++. It is used to write and upload programs to Arduino compatible boards, but also, with the help of 3rd party cores, other vendor development boards. The source code for the IDE is released under the GNU General Public License, version 2. The Arduino IDE supports the languages C and C++ using special rules of code structuring. The Arduino IDE supplies a software library from the Wiring project, which provides many common input and output procedures. User-written

code only requires two basic functions, for starting the sketch and the main program loop, that are compiled and linked with a program stub main() into an executable cyclic executive program with the GNU tool chain, also included with the IDE distribution. The Arduino IDE employs the program to convert the executable code into a text file in hexadecimal encoding.

3. SYSTEM IMPLEMENTATION

Testing about the bot stability and reliability the all-terrain vehicle is managed in the heavy surface. The implementation is done with the Arduino with dc motor and Bluetooth powered with battery. An android app is used control the vehicle.

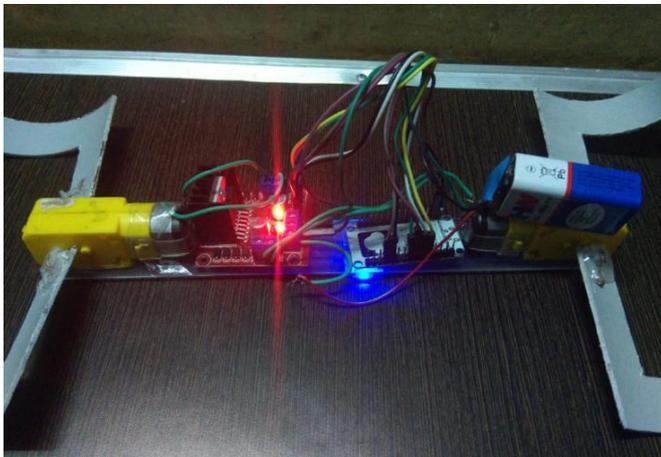


Fig-5: Top view of the bot

4. CONCLUSION

The overall bot will be useful in the future environment. It contains the process like autonomous vehicle, the robot and unmanned domestic vehicles. Even though it was useful in risky areas like prone based areas, it will work in the places even humans can't through it. If we place a camera on the top of the bot it will use to analyze present condition of the areas and in gassing areas which are harmful to humans.

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