

MULTIPURPOSE AGRICULTURE ROBOT USING SOLAR ENERGY

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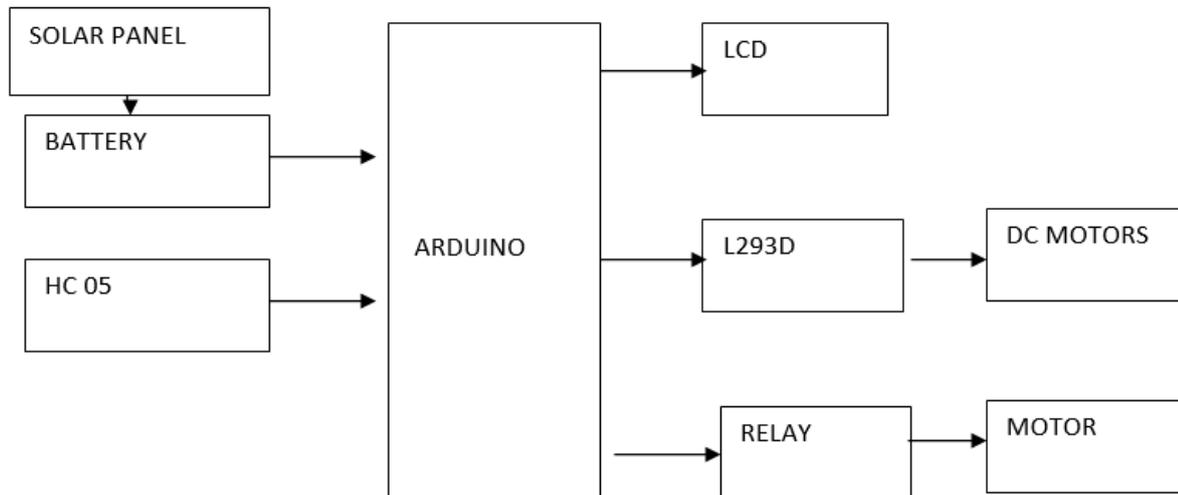
Abstract

The main objective behind developing this robot is for the surveillance of human activities in the border regions in order to reduce infiltration from enemy side and also can be used as spying the enemy moments by modifying the certain components we can use this robot for agriculture sector because, in India nearly about 70 percentage of people are depending on agriculture. Numerous operations are performed in the agricultural field like seed sowing, pesticide, grass cutting, ploughing etc by this we can reduce some burden to the farmers and also we can make it as human friendly not only farming we can use this for monitoring the fields during night time as we are implementing Night Vision camera we can observe the predator movements so we can be more attentive not only in agriculture domain, they also can be used for many purposes like street patrolling, in industries for checking on the employers work like wise and many.

INTRODUCTION

Agriculture is considered to be the basis of life for the human species as it is the main source of food grains and other raw materials. It plays a vital role in the growth of country's economy. It also provides large ample employment opportunities to the people. Growth in agricultural sector is necessary for the development of economic condition of the country. Unfortunately, the traditional methods of farming are still used by many farmers which results in low yielding of crops. But wherever automation had been implemented and human beings had been replaced by automatic machineries, the yield has been improved. Hence there is need to implement modern science and technology in the agriculture sector for increasing the yield. This paper therefore proposes a system which is useful in ploughing field as well as controlling the field operations which provides the flexibility. The paper aims at making agriculture smart using automation and Bluetooth technologies. The proposed system concentrates on performing functions like ploughing, sowing seeds, irrigation, closing the mud, fertilizing.

BLOCK DIAGRAM



ARDUINO UNO



The **Arduino Uno R3** is a microcontroller board based on the ATmega328 (datasheet). It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz crystal oscillator, a USB connection, a power jack, an ICSP header, and a reset button. It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with a AC-to-DC adapter or battery to get started.

HC-05 - Bluetooth Module



The **HC-05** is a very cool module which can add two-way (full-duplex) wireless functionality to your projects. You can use this module to communicate between two microcontrollers like Arduino or communicate with any device with Bluetooth functionality like a Phone or Laptop. There are many android applications that are already available which makes this process a lot easier. The module communicates with the help of USART at 9600 baud rate hence it is easy to interface with any microcontroller that supports USART. We can also

configure the default values of the module by using the command mode. So if you looking for a Wireless module that could transfer data from your computer or mobile phone to microcontroller or vice versa then this module might be the right choice for you.

Solar Cell



Although this is basically a junction diode, but constructional it is little bit different form conventional p-n junction diode. A very thin layer of p-type semiconductor is grown on a relatively thicker n-type semiconductor. We provide few finer electrodes on the top of the p-type semiconductor layer. These electrodes do not obstruct light to reach the thin p-type layer. Just below the p-type layer there is a p-n junction. We also provide a current collecting electrode at the bottom of the n-type layer. We encapsulate the entire assembly by thin glass to protect the **solar cell** from any mechanical shock.

BATTERY:



A battery works on the oxidation and reduction reaction of an electrolyte with metals. When two dissimilar metallic substances, called electrode, are placed in a diluted electrolyte, oxidation and reduction reaction take place in the electrodes respectively depending upon the electron affinity of the metal of the electrodes. As a result of the oxidation reaction, one electrode gets negatively charged called cathode and due to the reduction reaction, another electrode gets positively charged called anode. The cathode forms the negative terminal whereas anode forms the positive terminal of a battery.

L293D DRIVER IC



L293D is a dual H-Bridge motor driver, so with one IC we can interface two DC motors which can be controlled in both clockwise and counter clockwise direction and if you have motor with fix direction of motion the you can make use of all the four I/Os to connect up to four DC motors. L293D has output current of 600mA and peak output current of 1.2A per channel. Moreover for protection of circuit from back EMF

output diodes are included within the IC. The output supply (VCC2) has a wide range from 4.5V to 36V, which has made L293D a best choice.

DC MOTOR:



An electric motor is a machine which converts electrical energy into mechanical energy.

Principles of operation

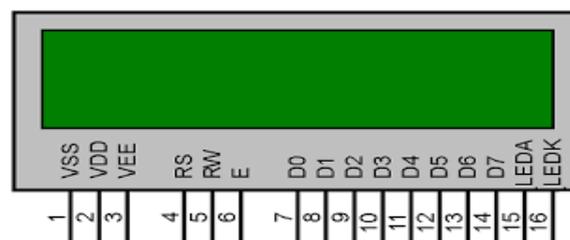
In any electric motor, operation is based on simple electromagnetism. A current-carrying conductor generates a magnetic field; when this is then placed in an external magnetic field, it will experience a force proportional to the current in the conductor, and to the strength of the external magnetic field. As you are well aware of from playing with magnets as a kid, opposite (North and South) polarities attract, while like polarities (North and North, South and South) repel. The internal configuration of a DC motor is designed to harness the magnetic interaction between a current-carrying conductor and an external magnetic field to generate rotational motion.

RELAY



Relays are used in a wide variety of applications. The advantage of relays is that it takes a relatively small amount of power to operate. Relays are simple switches which are operated both electrically and mechanically. Relays consist of an electromagnet. It also contains a set of contacts. The switching mechanism is based on electromagnet. Most of the devices have the application of relays.

LCD



It is called Liquid Crystal Display. We are going to use 16x2 characters LCD. This will be connected to microcontroller. The job of LCD will be to display all the system generated messages coming from the controller. LCD will provide interactive user interface. This unit requires +5VDC for its proper operation. This module is used for displaying the present status of the system.

APPLICATIONS:

The system or robot can be mainly use in agricultural field.

It is used in home gardening

It is used in sports ground

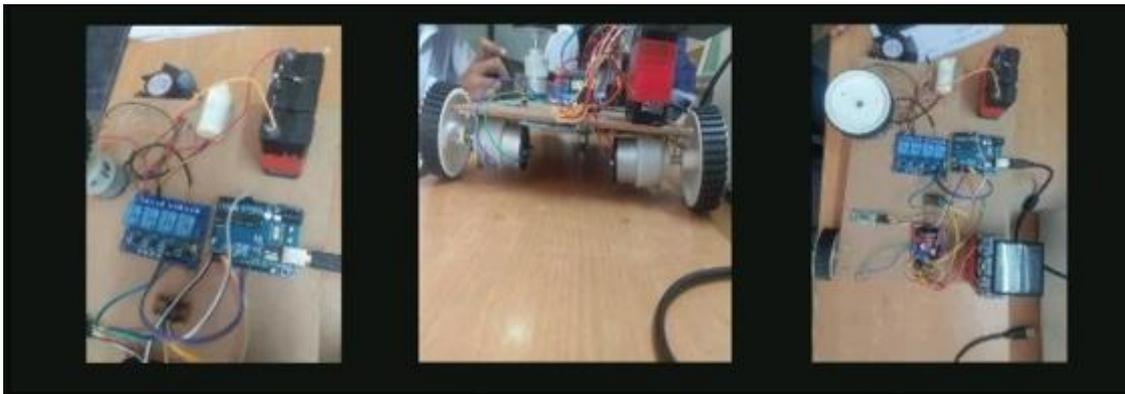
It is used in fruit gardens.

Military applications

Surveillance along border

Can be used in aerospace, domestic households and remote areas.

RESULTS:



CONCLUSION:

An autonomous multipurpose agrirobot is designed to perform the tasks like seed sowing, grass cutting and pesticide spraying. The model of robot can be described to build a robot using Night vision wireless camera by using android applications. This work is designed to perform sowing of two different sized seeds. The benefits of robot are reduced human intervention and efficient resources utilization. . Instructions are passed to the system using Bluetooth which ensures no direct contact with human and thus safety of operator is ensured. The robot is solar powered hence it is renewable energy source. The operations are performed using android app. Innovative seed sowing; grass cutting and pesticide sprayer equipment has significant influence in agriculture. By using this advanced work, farmer can save more time.

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