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Solar Power Driven Multifunctional Agribot

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***Abstract*- This paper aims to design an agricultural robot, which helps the people to survive where it performs operations such as digging of soil, sowing of seeds, spraying pesticide, cutting grass and ploughing and the detection of obstacles. In previous projects the techniques used were complicated as well as expensive. This AGRIBOT uses the renewable energy i.e. solar energy obtained from solar panel powered battery, it also consists of a visual obstacle detector and a Bluetooth module which is paired with a Bluetooth terminal application through which it is easily controlled and the instructions are given to the AGRIBOT for the operations to be performed. Hence this is a low cost AGRIBOT and is easy to operate without the need to go to the field personally it also helps the farmers to facilitate to ease work by reducing human effort, saving time and energy. By this farming can be done easily in any climatic condition irrespective of day and night. This agribot compared to other robots is very beneficial as it has multitasking functional system and advanced techniques for smart farming.**

***Keywords*- AGRIBOT, Solar Panel, Bluetooth Module.**

I. INTRODUCTION

In Ancient time to now immemorial, human being has been growing crops according to their needs. There are different types of farming depending on various factors like climate, soil, temperature, moisture and most importantly the need of the population.

Traditional farming systems include shifting cultivation (slash and burn), nomadic herding. Semi commercial systems include rice based, root crop based, grain legume based, agrisilvicultural, silvopastoral and agrisilvopastoral systems. Commercial systems include plantations, agro forestry and ranching.

Till now only human beings are connected to each other through the internet but with the advent of IOT even the things around us would be connected, making everything automatic. There is a high degree of accuracy in automation and that is why we have used IOT in our project. With changing times, man has overcome many problems but still some of the problems persist like ruining of crops by animals, water logging and unawareness of soil and air parameters. Our project aims to solve these problems. There are many other systems which do the entire farming automatically but the touch of human being is required because computer cannot beat generations of experience which man has gained in farming. Our project improves the efficiency of the farmer thereby improving the quality of his crops.

As the world is trending into new technologies and implementations it is a necessary goal to trend up in agriculture also. Many researches are done in the field of agriculture. Most projects signify the use of wireless sensor network collect data from different sensors deployed at various nodes and send it through the wireless protocol. The collected data provide the information about the various environmental factors. Monitoring the environmental factors is not the complete solution to increase the yield of crops.

There are number of other factors that decrease the productivity to a greater extent. Hence automation must be implemented in agriculture to overcome these problems. So, in order to provide solution to all such problems, it is necessary to develop an integrated system which will take care of all factors affecting the productivity in every stage. But complete automation in agriculture is not achieved due to various issues. Though it is implemented in the research level it is not given to the farmers as a product to get benefitted from the resources. Hence this paper deals about developing smart agriculture using IoT and given to the farmers.

In general, we recommend to focus on building on and strengthening ‘existing’ ecosystems, e.g. by linking to ‘mainstream’ agriculture and extending in the specific areas relevant to organic farming.

II. RELATED WORK

AGRIBOT uses the renewable energy i.e. solar energy obtained from solar panel powered battery ,it also consists of a visual obstacle detector and a Bluetooth module which is paired with a Bluetooth terminal application through which it is easily controlled and the instructions

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are given to the AGRIBOT for the operations to be performed .Hence this is a low cost AGRIBOT and is easy to operate without the need to go to the field personally it also helps the farmers to facilitate to ease work by reducing human effort, saving time and energy. by this farming can be done easily in any climatic condition irrespective of day and night. This agribot compared to other robots is very beneficial as it has multitasking functional system and advanced techniques for smart farming.

III. PROPOSED WORK

Today, the farmers are suffering from the lack of rains and scarcity of water. The main objective of this paper is to provide an automatic irrigation system thereby saving time, money & power of the farmer. The traditional farm-land irrigation techniques require manual intervention With the automated technology of irrigation the human intervention can be minimized. Whenever there is a change in temperature and humidity of the surroundings these sensors senses the change in temperature, humidity and wind speed then gives an interrupt signal to the micro-controller. Then the microcontroller sent a data to server using IOT modem.

IV. BLOCK DIAGRAM

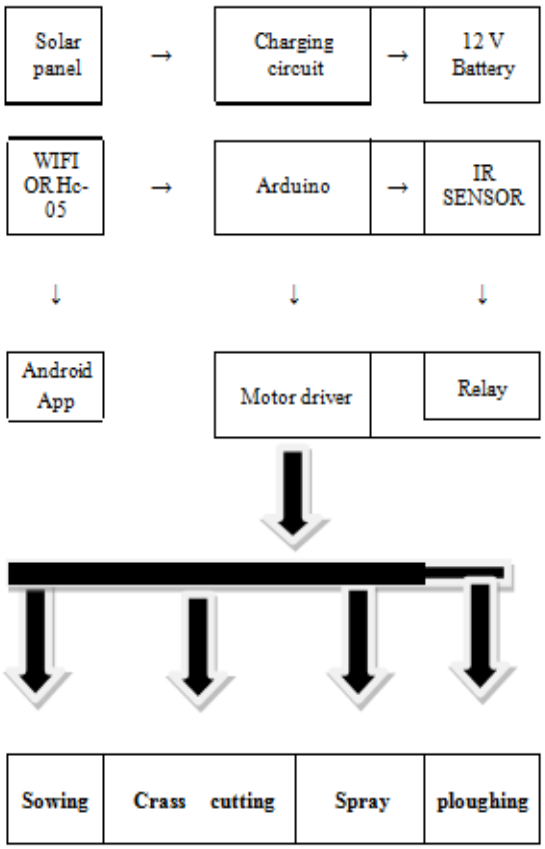

Fig 1. Block Diagram.

V. CIRCUIT DIAGRAM

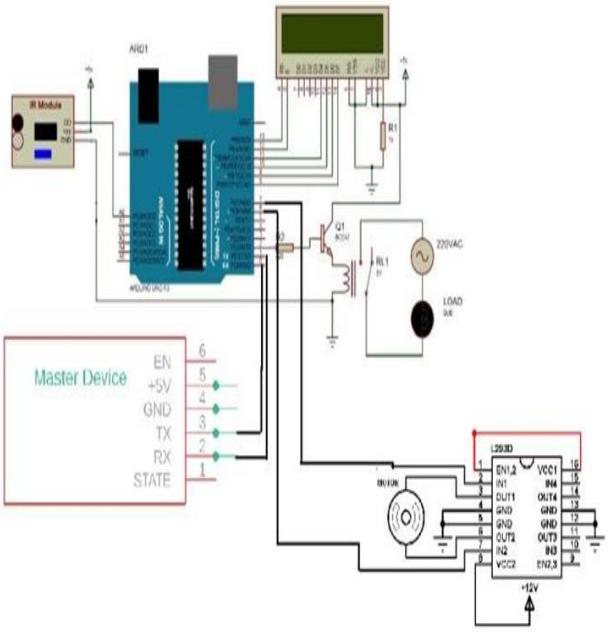

Fig 2. Circuit Diagram.

VI. MOTOR DRIVER IC L293D

The L293D is a typical motor driver which allows DC motor driver to drive on either direction. L293C is16 pin motor driver IC which provides bidirectional drive currents at voltages ranging from 5 V to 36 V. The L293D which consists 0f 8 pins on both sides with 2 DC motors and it have 4 input and output pins and 2 enable pins for the motors.

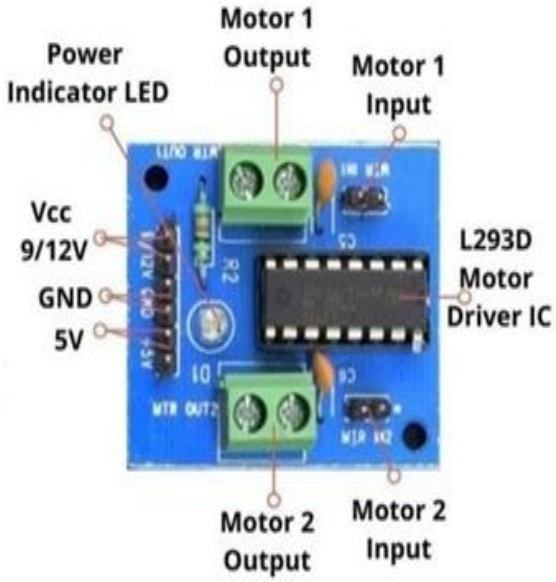

Fig 3. L293C is16 pin motor driver IC.

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VII. ARDUINO MICROCONTROLLER (AT MEGA 328)

The ATmega3289 is a microcontroller designed in a mega AVR family. It has a redesigned Harvard architecture 8-bit RISC processor core. It has 28 pins in total, where there are 13 pins for input and output where 5 pins are used for pulse width modulation outputs and 5 for analog inputs.

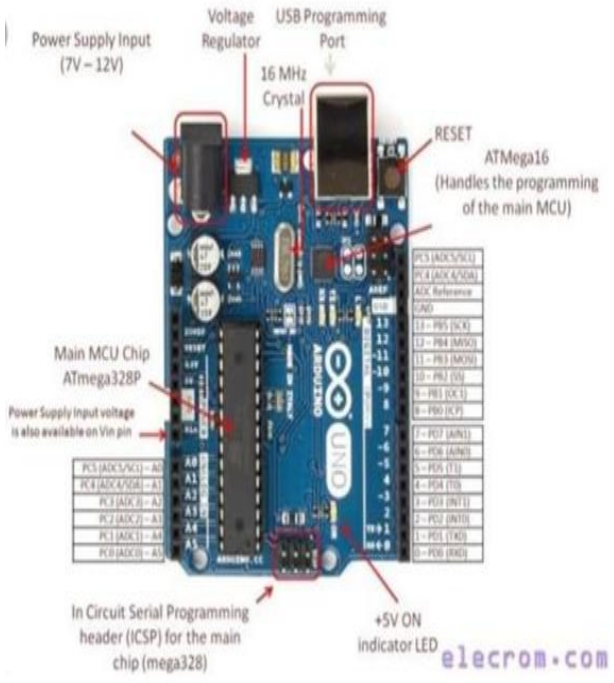

Fig 4. MEGA328..

VIII. RELAY

Relay is a switch which works on electromagnetism as relatively s mall electric current as it turns ON or OFF in huge amount of electric current. Relays are used by a split lower power signal which controls a circuit, by a single signal to multiple circuits. Relays were used widely to perform logical operations in telephone interchange and early in computers.

Fig 5. Relay.

IX. OBSTACLE DETECTION

In this AGRIBOT the IR infrared obstacle avoidance sensor module is used for detection of obstacles of the project. This sensor consists of a pair of infrared tubes of which one is the transmitting tube and the other one is the receiving tube. The receiver tube will receive the reflected IR waves when transmitting light waves are reflected back and the green light indicator gets on This module consists of three interfacing pins (Vcc, ground and output pins).

Fig 6. Three interfacing pins.

X. BLOCK DIAGRAM

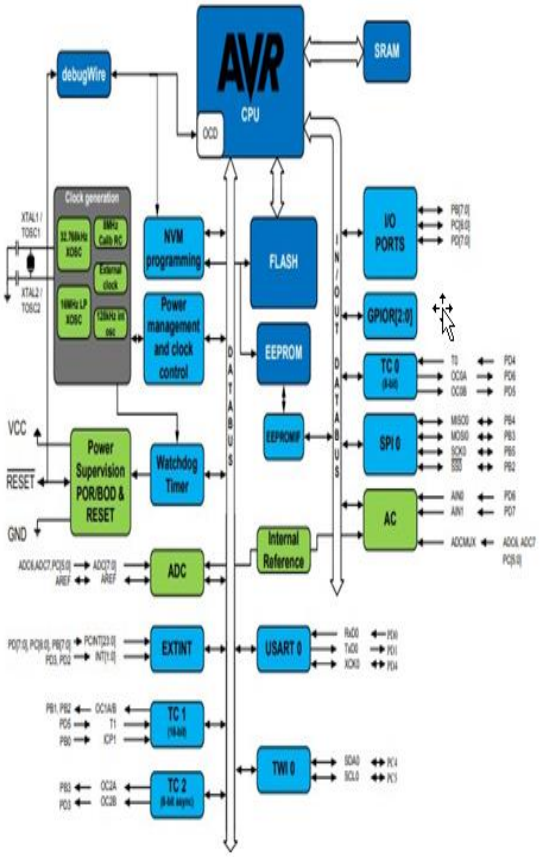

Fig 7. Block Diagram..

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XI. PIN DIAGRAM

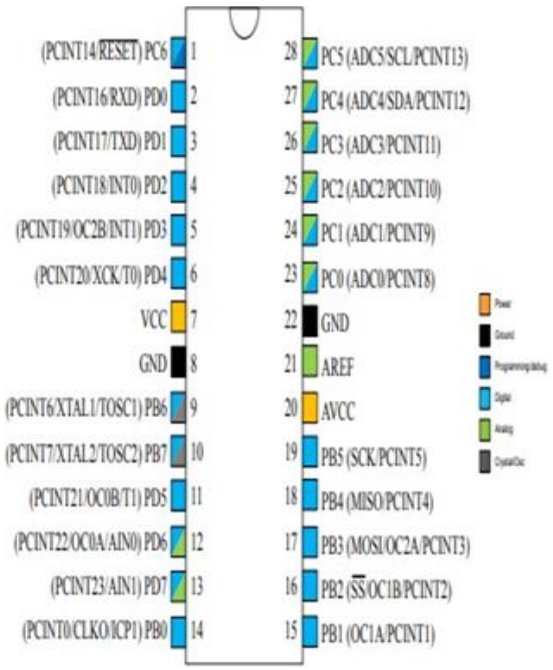

Fig 8. Pin Diagram.

1. Output

Fig 9. Output.

XII. CONCLUSION

The progress in science & technology is a non-stop process. New things and new technology are being invented. As the technology grows day by day, we can imagine about the future in which thing we may occupy every place.

The proposed system based on ARDUINO micro controller [micro chip is found to be more compact, user friendly and less complex, which can readily be used in order to perform. Several tedious and repetitive tasks. Though it is designed keeping in mind about the need for industry, it can extended for other purposes such as commercial & research applications.

Due to the probability of high technology (Atmel micro controller) used this "SOLAR POWER DRIVEN MULTI FUNCTIONAL AGRIBOT" system is fully software controlled with less hardware circuit. The feature makes this system is the base for future systems.

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