Automatic Irrigation by Smart Machine with Arduino Uno

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Abstract *Nowadays tree plantation is very important for human life. As we the trees are need of human life. Trees are contribute to their environment over long period of time by providing oxygen, improving air quality, climate amelioration, preserving soil, conserving water, and supporting wildlife. Trees absorb carbon dioxide from air and gave us the oxygen. Trees get dry because shortage of water. Some government scheme plant tree on road side but some dried because reduction of water. We always forget to supply water to plant. This project is based on this problem. The robot gives water to the plant. It is totally control with ARDUIN Uno. Whole system is controlled by ARDUIN Uno. It has four wheels to get move anywhere and has color Sensor to sense tag located at the trunk . It also have tank on the robot which fulfill from water. It is useful in urban area. It is automatically controlled by mobile. With the help of ARDUIN software we control it by moving any direction. It has also Bluetooth technology to control the robot without any wiring device. whenever the color sensor sense the color of tag it sends a command to Arduino to on the pump for irrigation. Tree plantation is important to our future and we have to save our world. From this small technique we can definitely save our nature of the earth.*

Key Words: *Bluetooth module, Arduino UNO, irrigation*

1.INTRODUCTION

As we know that India has the vast area to plantation trees. But somewhere trees are not properly grown and some getting dry because shortage of water. We should save our beauty of nature by creating some ideas, project for future life. And this is the chance and time to create beautiful nature in our country and all over the world. This is also helpful for farmer for farming. Drought is a measure problem of any farmer. To avoid this problem we should plant trees. If there is no trees monsoon will not come. If we plant tree by proper care plant will be grow easily and monsoon will come, weather condition is also depend on trees. If there is shortage of water plant won't grow properly. So, we have to plant tree everywhere. If forest area hasn't   maximum trees at this place we can to grow the trees with the help of this project. The farmer also farms the fruit trees in there farm. This will be helpful for the farming. The project is automatic Irrigation by smart machine. This is automatically controlled by ARDUINO UNO with color Sensor. Color Sensor is a main part of this project which sense the color the color of tag at the trunk of the tree. It is capable to Sensing color. At the trunk of the tree, we add the tags which is blue colored. Color Sensor is located outside the robot. So it should capable to sense the tag color or tag located at the trunk of the plant. If the tag is nearer color Sensor sends the signal to the ARDUIN and next procedure will be start. After sending command to ARDUIN.A ARDUIN sends the signal to pump to pump the water. With the help of new technology the automatic work was done by robots. And now we need to grow largest plant in our earth. Farmers are one of the largest developing economies of the world. The agricultural sector has its largest contribution in the Indian economy. Also, we should develop some new methods that use the renewable sources of energy. The development of these new techniques is going to reach our goal of country development. This technique will be a very good option for the incoming generation, who suffer every year just because of failure of plants that took place every year. The implementation of this technology has a wide scope in the future.

1.1 LITERATURE REVIEW

AUTOMATED IRRIGATION SYSTEM BASED ON SOIL MOISTURE USING ARDUINO (2017) By Abhishek Kumar and Magesh.S In this paper an automation of farm Irrigation and soil moisture control by Arduino using soil moisture sensor and L293D module. This automatic irrigation system senses the moisture content of the soil and automatically switches the pump when the power is on. A proper usage of irrigation system is very necessary because the main reason is the shortage of land reserved water due to lack of rain, spontaneous use of water as a result large amounts of water goes waste. For this reason, we use this automatic plant watering and soil moisture monitoring system and this system is very useful in all climatic conditions.

REALITY-BASED INTERACTION INTERFACE FOR AN AGRICULTURAL TELEOPERATED ROBOT SPRAYER By (2014)Georg Adamides, Georgia Christou and Christou katsanos, Mechalis xenos

In this paper the system used is semiautomatic teleoperation of an agricultural robotic. They had multiple cameras supporting peripheral vision and targeted spraying. This technology is very useful for farming. In this paper robot teleoperation combines human perception and know-how with robot accuracy and consistency and thus may provide a viable solution.

Plant Watering Autonomous Mobile Robot(2012)By Hema.N, Reema Aswani and Manisha Malik. In this paper shows automatic Irrigation System with RFID sensor. The main component of this paper is RFID sensor, which senses the RFID tag. It is completely autonomous mobile robot and cost effective system for watering indoor plotted plants. The paper describes the hardware architecture of the fully automated watering system which uses wireless communication to communicate the mobile robot and the Sensing module. This gardening robot is completely portable and is equipped with radio frequency identification (RFID) module. Robot has water reservoir and an attached water pump. It is capable of Sensing the watering need of the plants and finally watering them without any human intervention. In this paper the mobilization of the robot to the plotted plant is achieved using predefined path. An RFID tag is attached to each plotted plant.

An Automated Irrigation System for Smart Agriculture Using the internet of Things (2018) By V. Ramachandran, R. Ramalakshmi and Seshadhri Srinivasan. In this paper an automated irrigation system to reduce water utilization in agriculture by combining the Internet of Things (IoT), cloud computing and optimization tools. The automated irrigation system deploys low cost sensors to sense variables of interest such as soil moisture, pH, soil type, and weather conditions. The data is stored in Thingspeak cloud service for monitoring and data-storage.

RGB COLOR SENSING TECHNIQUE (2013)By Akriti Kaushik1, Aastha Sharama2

In this paper it shows that how colour sensor work .how the technology is used in different terms. It shows the color sensors are based on one of the color models, most commonly the RGB model (red, green, blue). A large percentage of the visible spectrum can be created using these three primary colors. Many color sensors are able to sense more than one color for multiple color sorting applications. Depending on the difficulty of the sensor, it can be programmed to know only one color, or multiple color types or shades for categorization operations. Implementation of an Automated Irrigation System (2015) By 1U N V P Rajendranath and Dr. V. Berlin Hency In this paper is to develop an automated irrigation system based on sensor, which are infrared to the microcontroller unit. The sensor used in this paper is temperature and humidity sensor DHT 11 sensor and soil moisture VH400. This sensor is interfaced to the microcontroller unit and whole unit was placed under the root zone of the plant. The irrigation system is tested under different temperatures and humidity levels of different plant under normal and wet condition. The use of soil moisture sensor is to limit the water content to the particular areas. Throughout all the values obtained in wet and normal condition are proved to be intuitive.
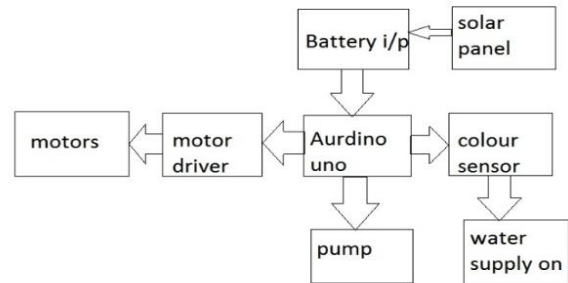
2. BLOCK DIAGRAM

Fig. Automatic irrigation by smart machine with Arduino UNO

Arduino

Arduino Uno has a number of facilities for communicating with a computer, another Arduino board, or other microcontrollers. The ATmega328 provides UART TTL (5V) serial communication, which is available on digital pins 0 (RX) and 1 (TX). An ATmega16U2 on the board channels this serial communication over USB and appears as a virtual com port to software on the computer.

LED: There is a built-in LED driven by digital pin 13. When the pin is high value, the LED is on, when the pin is low, it is off.

VIN: The input voltage to the Arduino/Genuino board when it is using an external power source (as opposed to 5 volts from the USB connection or other regulated power source). You
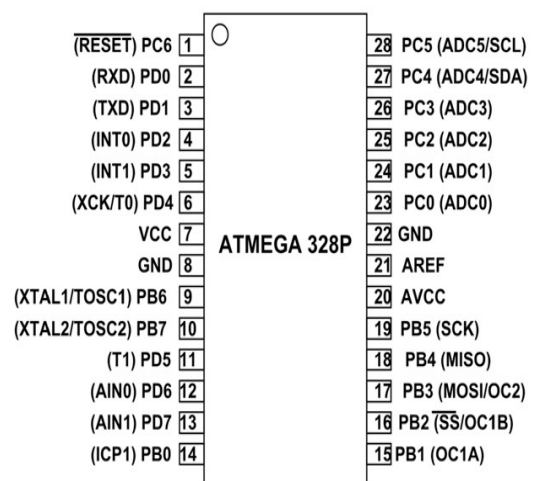
can supply voltage through this pin, or, if supplying voltage via the power jack, access it through this pin.

5V: This pin outputs a regulated 5V from the regulator on the board. The board can be supplied with power either from the DC power jack (7 - 20V), the USB connector (5V), or the VIN pin of the board (7-20V). Supplying voltage via the 5V or 3.3V pins bypasses the regulator, and can damage the board.

3V3: A 3.3 volt supply generated by the on-board regulator. Maximum current draw is 50 mA.

GND: Ground pins.

IOREF: This pin on the Arduino/ Genuino board provides the voltage reference with which the microcontroller operates. A properly configured shield can read the IOREF pin voltage and select the appropriate power source, or enable voltage translators on the outputs to work with the 5V or 3.3V.

Reset: Typically used to add a reset button to shields that block the one on the board.

Water Pump

To pump water from water tank. With the help of water pump it supplies water by pumping from the reservoir. The pumping of water is a basic and practical technique, far more practical than scooping it up with one's hands or lifting it in a hand-held bucket.

Fig. Water Pump

This is true whether the water is drawn from a fresh source, moved to a needed location, purified, or used for irrigation, washing, or sewage treatment, or for evacuating water from an undesirable location. Regardless of the outcome, the energy required to pump water is an extremely demanding component of water consumption. All other processes depend or benefit either from water descending from a higher elevation or some pressurized plumbing system.

Motor Driver L293D

L2993D is a typiacal motor driver IC which allow DCmotor to drive on either direction . L293D is a 16 pin IC which can control a set of two dc motor simultaneously in any direction.it means that you can controltwo dc motor with single L293DIC.

DC Geared Motor

A gear motor is a specific type of electrical motor that is designed to produce high torque while maintaining a low horsepower, or low speed, motor output. Gear motors can be found in many different applications, and are probably used in many devices in your home.

Colour Sensor

This is used for to sense the color. A color sensor TCS3200 is a type of "photoelectric sensor", which emits light from a transmitter, and then detects the light reflected back from the detection object with a receiver. If we stick the blue/green/red paper on plant it detects easily. To detect the color of material three main types of equipment are required. A light source to illuminate the material surface, a surface whose color has to be detected and the receivers which can measure the reflected wavelength.

3. CONCLUSIONS

This project is capable to supplying water to plant with the help of sensing component and some new technologies. It works accurate when it moving toward the plant and it sense the color of tag at the trunk of tree. With help of Bluetooth model it controls robot to move any direction.

ACKNOWLEDGEMENT

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