



Automatic Agriculture Spraying Using Arduino

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ABSTRACT: The responsibility of controlling and managing the plant growth from early stage to mature harvest stage involves monitoring and identification of plant diseases, controlled irrigation and controlled use of fertilizers and pesticides. The proposed work explores the technology of wireless sensors for remote real time monitoring of vital farm parameters like humidity, environmental temperature and moisture content of the soil. We also employ the technique of co2 sensor based automatic detection on farmer. Thus this paper vigorously describes the design and construction of an autonomous sensor featuring plant disease detection, growth monitoring and spraying mechanism for pesticide, fertilizer and water to apply in agriculture or plant nursery. To realize this work we provide a compact, portable and a well founded platform that can survey the farmland automatically and also can identify disease and can examine the growth of the plant and accordingly spray pesticide, fertilizer and water to the plant. This approach will help farmers make right decisions by providing real-time information about the plant and it's environment using fundamental principles of microcontroller and Sensor's technology .

KEYWORDS: CO₂ Sensor, Humidity, Spray Pesticide, Color sensor.

I. INTRODUCTION

The world's population is growing and with this growth must food must be produced. Due to the industrial and petrochemical revolutions, the agriculture industry has kept up in food production, but only by compromising the soil, the environment, health, and the food production system itself. The increased production has largely come from incremental changes in technology and economies of scale, but that trend is reaching a plateau. Conventional agriculture methods are unsustainable and a paradigm shift is needed. India plays a significant role in agriculture export to various countries, hence it's very shocking to find the efficiency is less than 30% compared to the developed countries. This is mainly due to the dependence on traditional methods and even higher dependence on the manual labor and on the monsoons which is not sufficient or reliable source of water, hence leading to limited water resources. Projects involving automation open up new ways for saving water and other resources while reducing the dependence on manual labor. Such technologies might further motivate the industries to start their own large scale farming which is still underdeveloped stating reasons such as manual labor is costly and inefficient. Similar to today's 3D printers and CNC milling machines, This automated sprayer hardware employs linear guides in the X, Y, and Z directions that allow for tooling such as seed injectors, watering nozzles, and sensors, to be precisely positioned and used on the plants and soil. The entire system is numerically controlled and thus fully automated from the sowing of seeds to harvest. The hardware is designed to be simple and scalable. To realize this work we provide a compact, portable and a well founded platform that can survey the farmland automatically and also can identify disease and can examine the growth of the plant and accordingly spray pesticide, fertilizer and water to the plant. This approach will help farmers make right decisions by providing real-time information about the plant and it's environment using fundamental principles of microcontroller and Sensor's technology .

II.LITERATURE REVIEW

The paper investigated the possible reasons for this phenomena, by continuing the review of agriculture robots, only this time focusing on practicality and feasibility. Upon extensive review and analysis, it was known that practical agriculture robots rely not only on advances in robotics, but also on the presence of a support infrastructure. This infrastructure encompasses all services and technologies needed by agriculture robots while in operation, this include a reliable wireless connection, an effective framework for Human Robot Interaction (HRI) between robots and agriculture workers, and a framework for software sharing and re-use. The paper provided a solution for these problems by helping farmer monitor



and control various activities through his mobile via GSM and DTMF technology in which data is transmitted from various sensors placed in the agricultural field to the controller and the status of the agricultural parameters are notified to the farmer using which he can take decisions. The main advantage of this system is that it was semi-automated i.e. the decision was made by the farmer instead of fully automated decision that results in precision agriculture. Handheld device is the mobile device which is held using hands and in normal because of the portability, simple operation and less power usage widely used in testing, automation control industry such as TV remote controllers, Air Conditioners etc. Due to the development of the handheld device in irrigation system.

Relevance to current Research

presented a paper on the REVIEW OF AGRICULTURE ROBOTICS-PRACTICALITY AND FEASIBILITY. The paper gave a review on concerns over food security which has raised sharply in recent years. The research activities on agriculture robotics were reviewed, with many showing promising results. However, agriculture robots remain experimental and far from being implemented on large operational scales. The paper investigated the possible reasons for this phenomena, by continuing the review of agriculture robots, only this time focusing on practicality and feasibility. Upon extensive review and analysis, it was known that practical agriculture robots rely not only on advances in robotics, but also on the presence of a support infrastructure.

Relevance to current Research

AUTOMATION IN AGRICULTURE The Single Chip Microcomputer Chooses Stc89c52 as its core chip, has 8LC of programming memory, 512 bytes of bytes of data memory, 8 interrupt sources, 3 counters, a good price ratio, and for faster processing speed crystal oscillator's frequency choosing around 19.7456MHz. To convert humidity value into digital data can be processed by SCM and system selects TLC1543 as its A/D conversion chip and can be used widely as multi-input channel.

Relevance to current Research

REGULATED DEFICIT IRRIGATION FOR CROP PRODUCTION UNDER DROUGHT STRESS. A Review As we know agriculture covers more than two-third of the total freshwater on earth. Due to this, there is a conflict arising between agriculture and other major economic sectors for allocation or in distribution of freshwater. So, to avoid conflicts new irrigation technology .

III.METHODOLOGY OF PROPOSED SURVEY

Solar panels are active solar devices that convert sunlight into electricity. They come in a variety of rectangular shapes and are usually installed in combination to produce electricity. A solar panel or module is a series of interconnected silicon cells joined together to form a circuit .In greater numbers the amount of power produced by these interconnected cells can be increased and used as an electricity production system. The solar panels after being hermetically sealed to protect them, are covered in a non-reflective glass to protect the solar cells from environmental damage and placed into a rigid frame. Voltage sources in a circuit may have fluctuations resulting in not providing fixed voltage outputs. A voltage regulator IC maintains the output voltage at a constant value. 7805 IC, a member of 78xx series of fixed linear voltage regulators used to maintain such fluctuations, is a popular voltage regulator integrated circuit (IC). The xx in 78xx indicates the output voltage it provides. 7805 IC provides +5 volts regulated power supply with provisions to add a heat sink. A Color Sensor detects the color of the material. This sensor usually detects color in RGB scale. This sensor can categories the color as red,blue or green. These sensor are also equipped with filters to reject the unwanted IR light and UV light.To detect the color of leaf, three main types of equipment are required. A light source to illuminate the leaf surface, a surface whose color has to be detected and the receivers which can measure the reflected wavelengths.

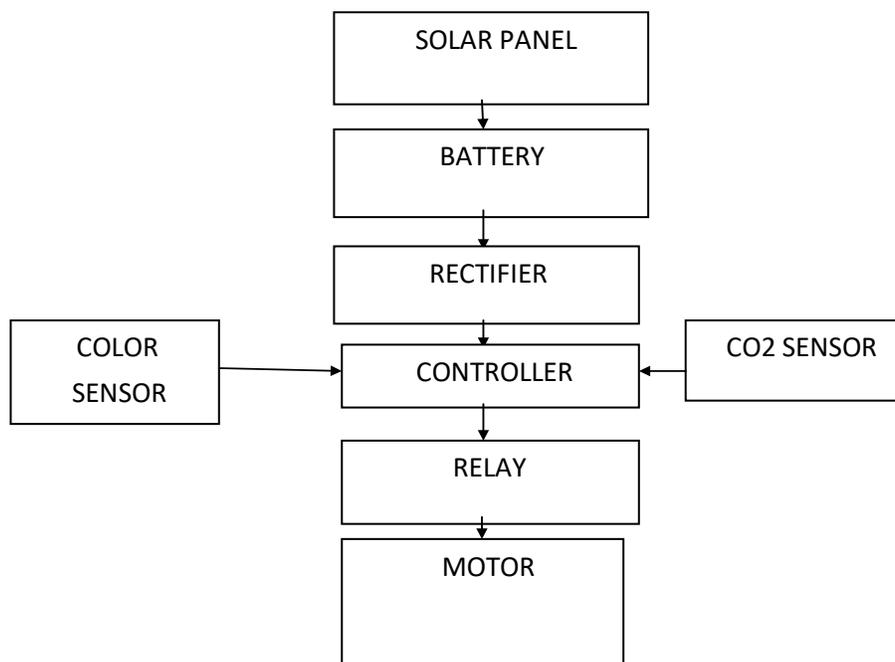


Figure 1: Proposed Block Explanation

IV. CONCLUSION AND FUTURE WORK

It can hereby see that the combination of hardware and software provides a economic irrigation controlling system which is extremely user friendly because it requires very less human interference for its operations once it is manufactured and implemented. It not only saves the most precious gift of the nature, i.e., water. It also helps the farmers to grow their crops under controlled conditions and under continuous observation by temperature monitoring. Hence, this project "Automatic Irrigation System with temperature monitoring" also helps in increased and good quality. To power the system exclusively with solar energy, the first thing needed is to calculate how much electricity it uses so that the solar system can be sized appropriately. This can be done by estimating the duty cycle of each component and then tallying up the estimated energy usage. Once determined the daily energy usage of the system, it is needed to size the solar panel and battery such that it can run continuously without running out of power as shown in On a sunny day, your solar panel will need to produce more power than the system uses so that the extra energy can be saved in the battery for rainy days..

Here all the component is used for the supply of the required current for +5V. There are two sensors used which are: temperature sensor, co2 sensor,. A fan, , water pump, artificial light and motor pumps are attached to the Arduino for cooling purpose. So that the user can easily monitor and control the parameters through android mobile application. For which android application is developed. And the user can also log on the application by providing username and password for verification. The following data of the use is stored in database. A controller is also used to send text messages which immediately displays the current status of the environmental parameters. analyse the excess of temperature and co2 in the environment. Where high temperature effects the ability of crops, to produce fruits. Hence the whole system sends SMS alert to the various mobile users.



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