PRECISION AGRICULTURE USING HANGING ROBOT

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ABSTRACT - *The precision agriculture monitoring system is an emerging concept, because sensors are capable of providing information about agricultural fields and then Artificial Intelligence takes decision automatically based on the sensor values. Monitoring environmental conditions is the major factor to improve yield of the efficient crops. In this project, we present a new approach by using hanging robot with virtual assistance in the agriculture field by monitoring moisture, temperature, light intensity, gas present in the atmosphere. And if any disease detected then this system will automatically spray the fertilizer and pesticides on the plant for improving the growth of the crops.*

Key Words: Arduino UNO, Humidity Sensor, Temperature Sensor, Gas Sensor. Light Sensor, ZigBee

1. INTRODUCTION

Farmers are now using EMBEDDED AND IMAGE PROCESSING techniques for precision farming, tracking crop humidity, soil composition, and temperature in growing areas, allowing them to increase their yields by studying how to take care of their crops and deciding the optimal amount of water or fertilizer to be used. In fact, robots and wireless sensor network technology are helping to promote new, more efficient agricultural methods that take agriculture indoors and to new heights to save energy, reduce pesticides, and shortening the market time. These robots grow food with no farmers, more like a lean factory than a plant.

EXISTING SYSTEM

In the existing system a person have to monitor the physical parameters and will take further steps. High amount of laborers are needed to sowing the seeds in the land, weeding and cultivating the crops for that land. Many of the person will be affected while spraying the pesticides or fertilizers to the land. Because DDT, MALATHION are highly powerful pesticides in these pesticides are used maximum farmers in India.

DISADVANTAGES:

- The human intervention was high.
- It is not possible to monitor and control the parameters all the time.
- Depending upon the climate the farmer takes more time for monitoring the parameters.

PROPOSED SYSTEM:

In this proposed system, we develop a Precision agriculture system by using hanging robot with virtual assistance, in that various sensors, microcontroller are used. In this proposed system we using artificial intelligence which act as a virtual assistance. Artificial intelligence is used to take a decision and action instead of human being. Real time monitoring of plant growth can be done with the help of artificial intelligence programming. For this we use mat lab software. In case if any disease detected in the leaf or fruits of the plant or if the plant growth is affected due to climate changes then the mat lab will process it with the help of AI. And that image will be send to the microcontroller unit with the help of serial communication device called ZigBee. In case if any disease detected then that information will be send to the microcontroller, so the micro controller will take the required action i.e a pesticide motor connected with the robot will automatically turned ON. And if the growth of the plant is reduced then the fertilizer will automatically turned ON.

- Our proposed system consists of a gas sensor which helps to monitor the greenhouse gases in the atmosphere.
- In this paper gas sensor is used to monitoring the greenhouse gases in the environment. Because the increase in greenhouse gases will highly affect the plant's growth.
- Light sensor is used for automatic Lights ON and OFF in farm land based on Light intensity.

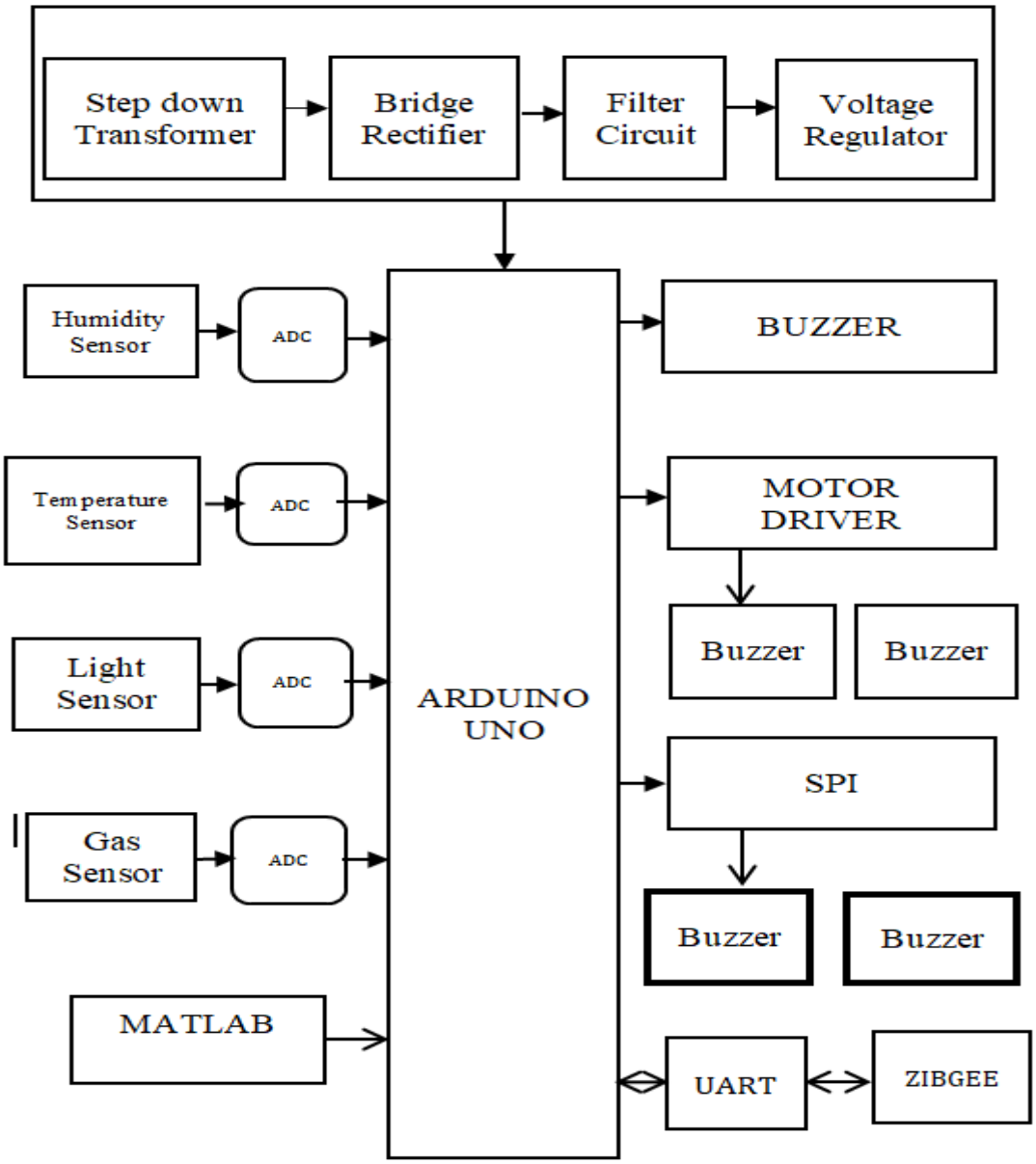
- Various sensors like temperature, humidity are used to monitoring environmental condition of the agricultural land.
- Thus our proposed system for precision agriculture using AI and wireless sensor network can be implemented.

ADVANTAGES

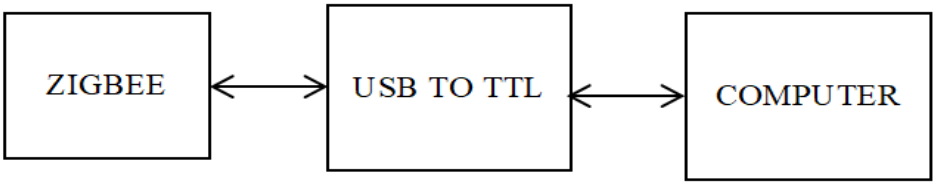
- AI in Precision Agriculture provides better efficiency and accurate results.
- Hanging robot reduces resource consumption & human intervention.
- Improves plant growth.
- Fertilizing and pesticides can be automatically applied to the plant without human help.

BLOCK DIAGRAM

TRANSMITTER PART



RECEIVER PART



ARDUINO UNO

Arduino Uno is a microcontroller board based on 8-bit ATmega328P microcontroller. Along with ATmega328P, it consists other components such as crystal oscillator, serial communication, voltage regulator, etc. to support the microcontroller. Arduino Uno has 14 digital input/output pins (out of which 6 can be used as PWM outputs), 6 analog input pins, a USB connection, A Power barrel jack, an ICSP header and a reset button.

FLOW CHART

HUMIDITY SENSOR

A humidity sensor (or hygrometer) senses, measures and reports both moisture and air temperature. A humidity sensor work by detecting changes that alter electrical currents or temperature in the air. **Humidity sensors** are used for determining the **moisture** content. Therefore, an accurate and precise means of testing **moisture** content in grain will help farmers monitor their crops. With the aid of monitoring, farmers may dry their grain until the preferred **moisture** content is achieved.

TEMPERATURE SENSOR

Temperature sensor is used to measure temperature readings through electrical signals.

The sensor is made up of two metals, which generate electrical voltage or resistance once it notices a change in temperature

GAS SENSOR

Gas sensing technology has the power to greatly assist the productivity of **agriculture**, allowing farmers to keep up with growing food demands and make their lives a lot easier.

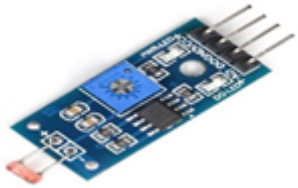
The green house gas is detected by carbon dioxide and methane sensing.

DC MOTOR

DC Motor in converts DC electrical power into mechanical power. The DC motor can move in both clockwise and anticlockwise directions depending on the sign of voltage applied between its terminals.

The DC motor operates at a range of 3 to 9V and runs at a speed of 3000RPM.

LIGHT SENSOR



The intelligent **agriculture** techniques mean using the **sensor** system to control the **light intensity**.

The **light sensor** is an electronic device which is **used** to detect the presence or no presence of **light** and darkness.

L293D Motor Driver

L293D IC is a typical **Motor Driver** IC which allows the DC **motor** to drive on any direction. This IC consists of 16-pins which are used to control a set of two DC **motors** instantaneously in any direction.

BUZZER

A **buzzer** or beeper is an audio signalling device, which may be mechanical, electromechanical, or piezoelectricBuzzer is a kind of voice device that converts audio model into sound signal. It is mainly used to prompt or alarm.

ZIGBEE

ZigBee is an IEEE 802.15.4-based specification for a suite of high-level communication protocols used to create personal area networks with small, low-power digital radios, such as for home automation, medical device data collection, and other low-power low-bandwidth needs, designed for small scale projects which need wireless connection. Hence, ZigBee is a low-power, low data rate, and close proximity wireless ad hoc network.

CONCLUSION

The **agricultural** sector is of vital importance for the region. It is undergoing a process of transition to a market economy, with substantial changes in the social, legal, structural, productive and supply set-ups, as is the case with all other sectors of the economy.

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