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Modern Agriculture using Sensors

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Abstract: ***In this project came from the countries where economy is based on agriculture and the climatic conditions lead to lack of rains & scarcity of water. The farmers working in the farm lands are solely dependent on the rains and bore wells for irrigation of the land. Even if the farm land has a water-pump, manual intervention by farmers is required to turn the pump on/off whenever needed and also the farmer need safety for their components and they need vegetable safety from wild animals. The aim of our project is to minimize this manual intervention by the farmer, which is why we are using a ARDUINO UNO. If the wild animals is entering inside the farm land means will be altered. So this project is very useful to modern agriculture.***

I. INTRODUCTION

Agriculture uses 85% of available freshwater resources worldwide, and this percentage will continue to be dominant in water consumption because of population growth and increased food demand. There is an urgent need to create strategies based on science and technology for sustainable use of water, including technical, agronomic, managerial, and institutional improvements. Drip irrigation system makes the efficient use of water and fertilizer. Water is slowly dripped to the roots of the plants through narrow tubes and valves. Water is fed directly to the base of the plants which is a perfect way to water plants. There should be proper drainage in the fields or pot plants to avoid any water logging which in case may affect the productivity.There already exist automatic drip irrigation systems which water plants based on soil humidity, pH value of soil, temperature and light. These parameters are required in big agricultural fields where productivity of the crop matters. Then we are preventing agriculture land from animals using ir sensor with gsm module.

II. RELATED WORK

A. Preventing Agriculture Land from Animals

A major challenge in agriculture is to prevent agriculture land from animals.in early days Agriculture land belonging to individual farmers are maintain using fensing.Now we are implementing new technologies.so we are using IRSENSOR to detect the motion of animal.

B. Automated Irrigation System

There have been technological advancements in agriculture sector from the last decades and growth of the irrigated areas. 85% of available water resources are used for agricultural lands.To find the moisture content of the land, we use soil moisture sensor in the land. Using these data the diver board controls the automatic ON and OFF of motor.

III. SYSTEM ARCHITECTURE

In the proposed system we are using arduino and various sensors like ir sensor and soil moisture sensor, senses the environment and send signal to Arduino. Arduino has inbuilt Atmega processor which process the data and send it to database.The ir sensor detect the motion of animal and send the information to user using GSM module ,at the same time buzzer and led will automatically ON in the agriculture land.They are all connected with arduino device .Soil moisture sensor is used to find the moisture of the land ,it also with arduino.Aautomatically control the motor with the help of driver board.

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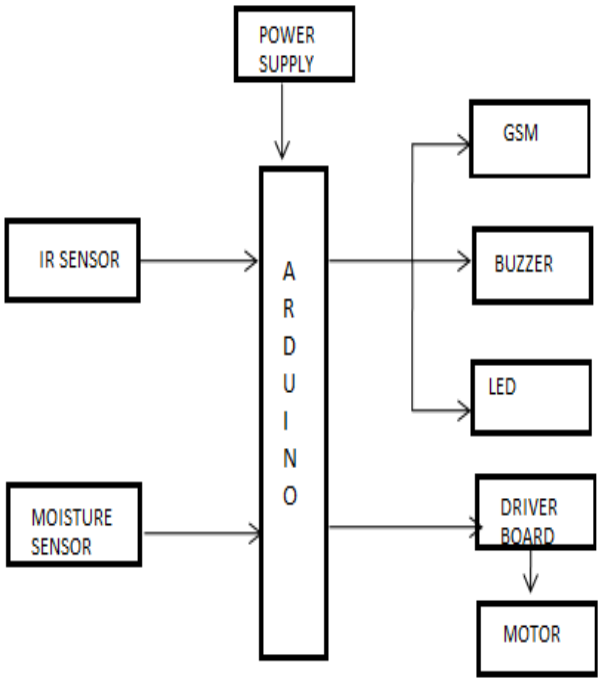

Fig 1.System Architecture

IV. ADVANTAGE

A. There is no need of manual power to controlling the water pump .wild animal entering in the farm land prevented.
B. Minimizing the wastage of water.

V. BLOCK DESCRIPTION

A. IR Sensor

An infrared sensor is an electronic device that emits in order to sense some aspects of the surroundings. An IR sensor can measure the heat of an object as well as detects the motion. These types of sensors measures only infrared radiation, rather than emitting it that is called as a passive IR sensor. Infrared radiation is the portion of electromagnetic spectrum having wavelengths longer than visible light wavelengths the region roughly from 0.75µm to 1000 µm is the infrared region

All objects which have a temperature greater than absolute zero (0 Kelvin) posses thermal energy and are sources of infrared radiation as a result.Infrared sensors typically use infrared lasers and LEDs with specific infrared wavelengths as source. Infrared waves are invisible to human eyes.

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B. Soil Moisture Sensor

Soil moisture sensors measure the volumetric water content in soil. Since the direct gravimetric measurement of free soil moisture requires removing, drying, and weighting of a sample , soil moisture sensors measure the volumetric water content indirectly by using some other property of the soil, such as electrical resistence, dielectric constant, or interaction with neutrons,as a proxy for the moisture content

C. Arduino

Arduino is open-source computer hardware and software company, project and user community that designs and manufactures microcontroller-based kits for building digital devices and interactive objects that can sense and control objects in the physical world.The project is based on microcontroller board designs, manufactured by several vendors, using various microcontrollers. These systems provide sets of digital and analog I/O pins that can be interfaced to various expansion boards ("shields") and other circuits. The boards feature serial communications interfaces, including USB on some models, for loading programs from personal computers. For programming the microcontrollers, the Arduino project provides an integrated development environment (IDE) based on the Processing project, which includes support for the C and C++ programming languages.

D. GSM

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GSM stands for Global System for Mobile Communications. It is a standard set developed by the European Telecommunications Standards Institute (ETSI) to describe protocols for second generation (2G) digital cellular networks used by mobile phones.A Modem is a device which modulates and demodulates signals as required to meet the communication requirements. It modulates an analog carrier signal to encode digital information, and also demodulates such a carrier signal to decode the transmitted information. A GSM Modem is a device that modulates and demodulates the GSM signals and in this particular case 2G signals. The modem we are using is SIMCOM SIM300. It is a Tri-band GSM/GPRS Modem as it can detect and operate at three frequencies (EGSM 900 MHz, DCS 1800 MHz and PCS1900 Mhz). Default operating frequencies are EGSM 900MHz and DCS 1800MHz.

VI. MODULE

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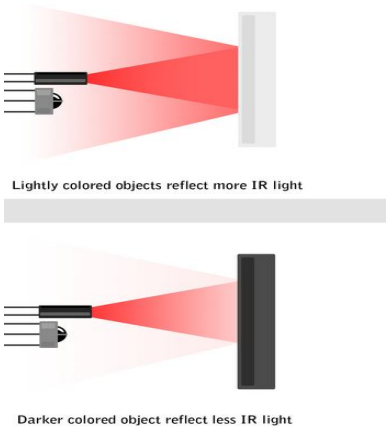

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VII. CONCLUSION

The objective of this paper is to design a fully automated irrigation and protect agriculture land from animals using MOISTURE SENSOR,IR SENSOR,GSM and ATMEGA processor. The system provides a real time feedback control module which monitors and controls all the activities of drip irrigation system efficiently.

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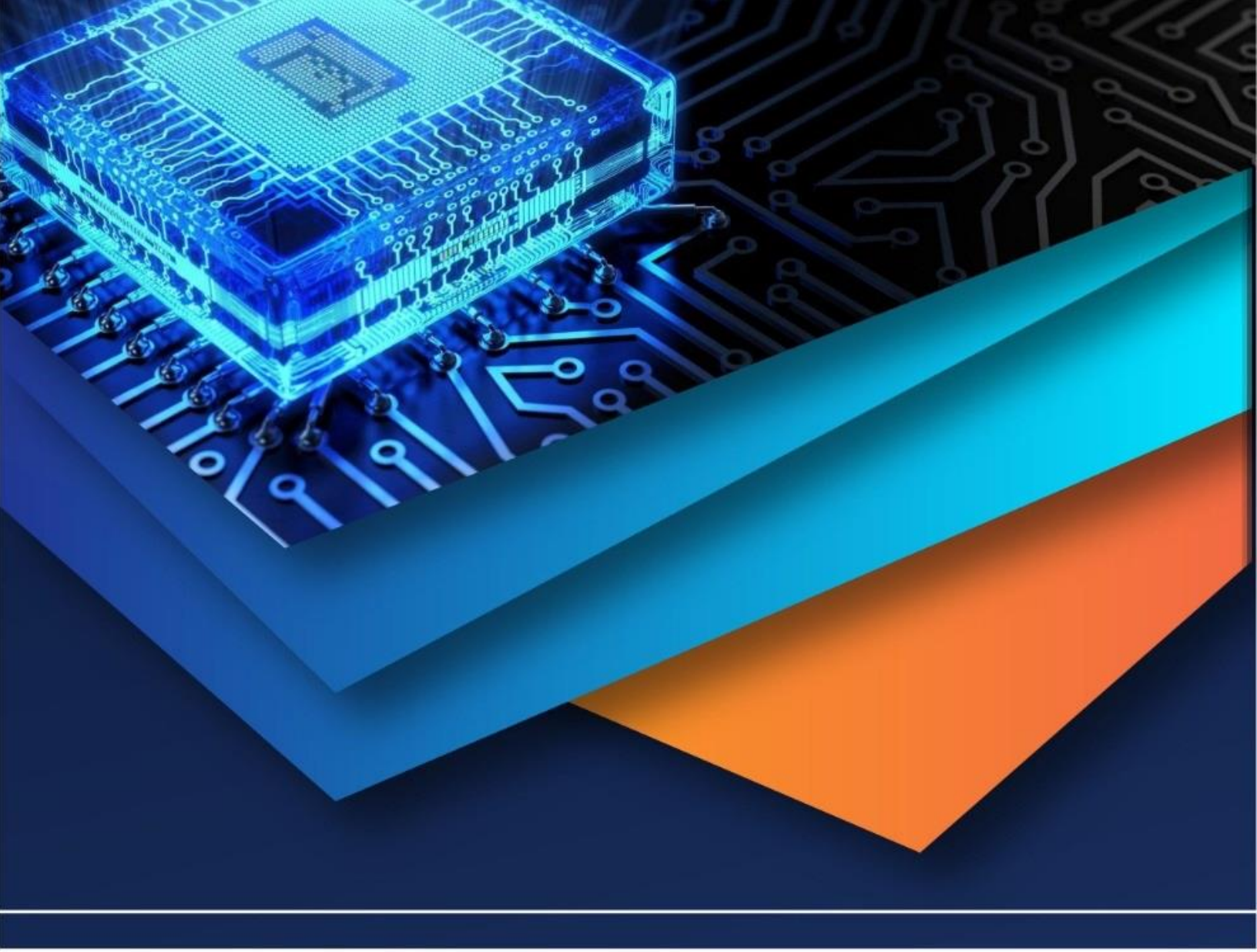

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