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Implementation of Crop Protection System against Wild Animals Attack

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ABSTRACT

In the agriculture field, the crop yielding isacquiring minimized by the wild animal attacks. The necessary factor is to stop the animals that pass out of the forest into the agricultural land,hasbecomeoneinalltheincreasingissuethatinfluence agriculture. The farmers ache heaps by the animal barrage. Generally, individuals additionally lost their lives whereas they struggle to banish the animals out of their place. The animals set foot into the agricultural land due to the shortage of water supplies within the forest areas and deforestation.To enhance agriculture because of the endurance of the fittest,wild animals that a set foot in to the Agricultural land is often viewed and a repelled device is employed to supply the ultrasound thatannoystheanimalsanddirectsthem.Togetherwithahearth detector is superimposed to avoid the spreading of fireside from the biological science areas to the agriculture. With the assistance of IoT,an alert are often given relating to the animal foot in and also the forestfire.

1. INTRODUCTION

Arduino is an associate open provide element and code company, project, and user community that designs and constructs single-board microcontrollers and microcontroller kits for form digital devices and interactive body which will sense and management body inside the physical world. Arduino board devices utilize a ramification of microprocessors and controllers. The boards provide sets of digital and analog entry/exit (I/O) pins which can be interfaced to varied enlargement boards (shields) and different circuits.

The board's characteristic sequential communications links, moreover as Universal Serial Bus (USB) on a few of patterns that are utilized for charge programs out of distinctive computers. The Internet ofthings (IoT) is that the network of the human body, motors, domestic materials, and various things implant with natural ideology, software, sensing parts, actuators, and network belongings that permit this stuff to connect and swap data. Each issue is unambiguously identifiable through its implant ADPS but is prepared to between process at intervals the triumph webconfiguration.

2. PROPOSED SYSTEM

Here, we decide to monitor the wild animals where the PIR sensor detects the presence of object and load cell Animal variation is found by the load cell. If an animal is identified, the repeller devices start producing sound at three different frequenciesbasedonthetypeofanimaldetected.Monitoring details send to the web server via IOT device andArduino.

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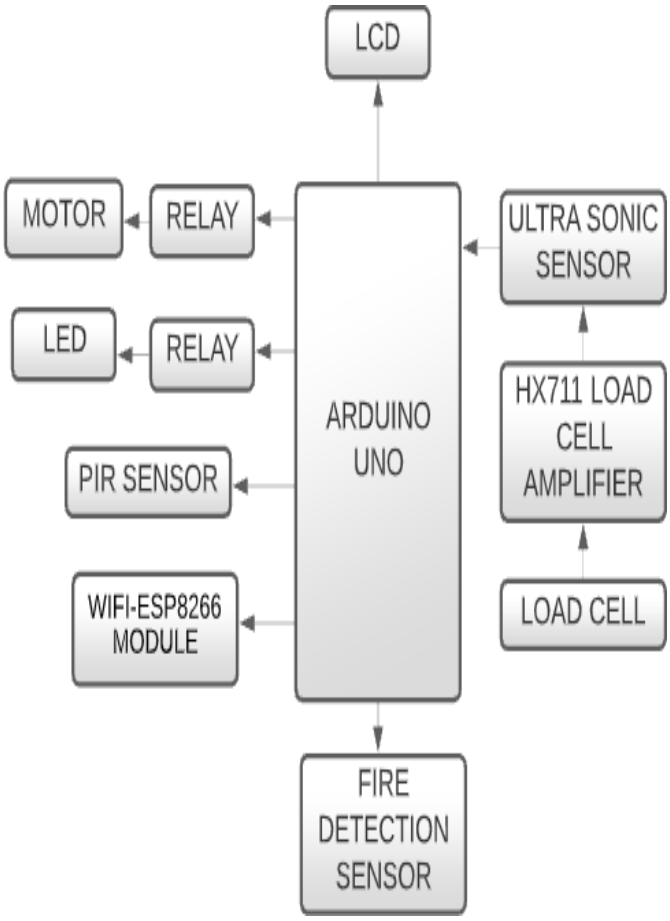
3. BLOCK DIAGRAM



3.1.ARDUINO MICROCONTROLLER

Arduino Uno(ATmega328p) is a microcontroller with 14 digitalI/Opins6Analoginputpins,USBConnector,Crystal Oscillator, Voltage Regulator, a power port and a reset button.

The suggested range of voltage is from 7 to 12 volts. It uses three types of memory. Code is

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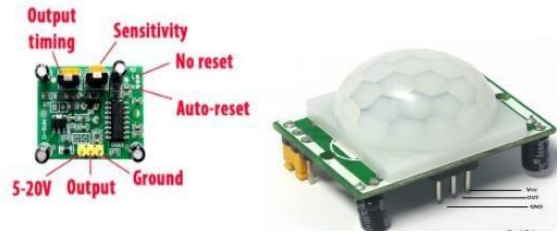
stored in 32KB flash memory,2KB of SRAM (Static Random Access Memory), and 1KB of EEPROM (Electrically Erasable Programmable Read-Only Memory). The program is loaded from Arduino IDE to Arduino board via USBport.

3.2.PIRSENSOR



It detects whether the human is within the sensor's range or has moved out of the sensor's range. These are tiny, affordable, low-power, user-friendly and they have a wide range of the lenses. The Liquid Crystal Display module includes two rows.Each characterisassembledby a 5x8pixelbox.Itisoperatedontwo modes. It works faster on 8- bit mode than 4- bit mode. The operating voltage varies from 4.7 to 5.3V and the current utilization is1mA.

The ESP826 is a module well suited with full TCP/IP capability, sitting on an Integrated Microcontroller Unit board (MCU) which allows it to manipulate I/Digital pins through an easy pseudo-code-like programming language. It connects the PIC to the internet, hence allowing the affected person essential signal analyzing to be transmitted in real-time over the net for the healthcare providers.

The sensor is used to produce ultrasound. The sound producedissoundwaveswithhigherfrequencieswhichhas an audible limit higher than the human hearing. The audible limit of humans varies from one person to another and it is 20KHz.Ultrasound's frequencies range from 20KHz to numerousGHz.

3.6.HX711 LOAD CELL ANDAMPLIFIER

It measures the weight of the object detected. This amplifier isusedtointegrateloadcellseasilyintotheprojectwithoutthe use of any other amplifiers or dual powersupply.

3.7 RELAY

It is a switch which is used for the manual purpose such as openingandclosingofthecircuit.Itisalsousedtoconnector disconnecttwocircuits.Alongwiththemanualoperation,itis also applied with an electrical signal, which in turn connect or disconnect anothersignal.

8.DCMOTOR

Itconvertsdirectcurrentintomechanicalwork.Itisdeployed bytheprinciplecalledLorentzLaw.Theforceexperiencedis known as the Lorentz force. It follows Fleming's Left Hand Rule.

The two major parts of a DC motor are Armature and Stator. The induced AC in the armature is converted into DC by the commutator. Current from the rotating part to stationary external load is transferred by brushes.

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9. FIRE DETECTIONSENSOR

This device detects smoke or fire in the surroundings. An alertsoundisblownsothat,thenearbypeoplecouldbealert.

BLYNK

Blynk was particularly designed for IoT. It will manage hardware remotely, it'll show detector data, it'll store data, visualizeit, and do many various cool things. There are three major parts at intervals of the platform.Blynk app acts as a communication bridge between the hardware and smartphones.

WORKING OF BLYNK APP

There are 3 major parts within the platform.

BLYNK APP- permits to us manufacture extraordinary interfaces for our originatesharassment varied widgets we provide.

BLYNK SERVER- is responsible for communications between hardware and smartphone. Blynk Cloud or else the personal Blynk server can also be used. Its code document might merely handle thousands of devices and will even be launched in the Raspberry Pi.

BLYNK LIBRARIES are used in most of the hardware platforms. It interacts with the server and processes all the outgoing and incoming commands. Whenever we press the button in the Blynk app the message reaches the Blynk Cloud, and then it will reach the hardware. Blynk app is used widely in IoT applications.

FEATURES OF BLYNK APP

The Blynk app can be connected to the cloud using GSM, Wifi, Ethernet,Bluetooth and BLE,USB (Serial). Blynk app is user-friendly application. Similar Applications and User Interface for all supported hardware devices. Sending notifications-mails,tweetsetc...Ispossible.Theyalsokeepon adding new features in the BlynkApplication.

Hardwares such as Raspberry Pi,Arduino or similar kind of development kit areused.

BlynkApplicationusesinternetforitsworking.Thismeans that the hardware that we are going to use should be capable of connecting to the internet. Few boards like Arduino Uno needs WIFI Shield or an Ethernet to communicate .Others like ESP8266 are already internet enabled, Raspberri Pi connected with Wi-Fi dongle, Particle Photon or Spark Fun BlynkBoard.Ifshield,isnotavailablealsowecanconnectit over USB to the laptop. There are also many hardware's available that can be connected to Blynk.

A Smartphone: Blynk App works on both iOS Mobiles and AndroidMobiles.BlynkAppisaverygoodinterfacebuilder.

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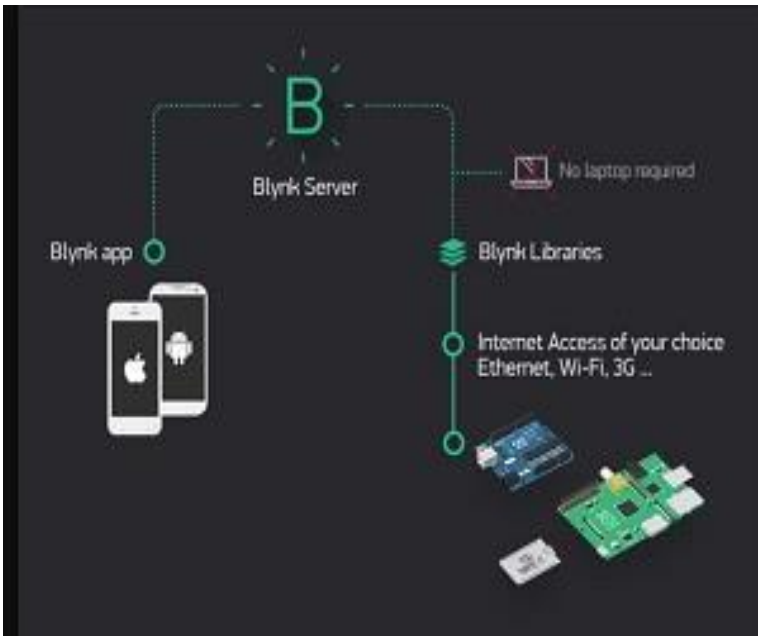

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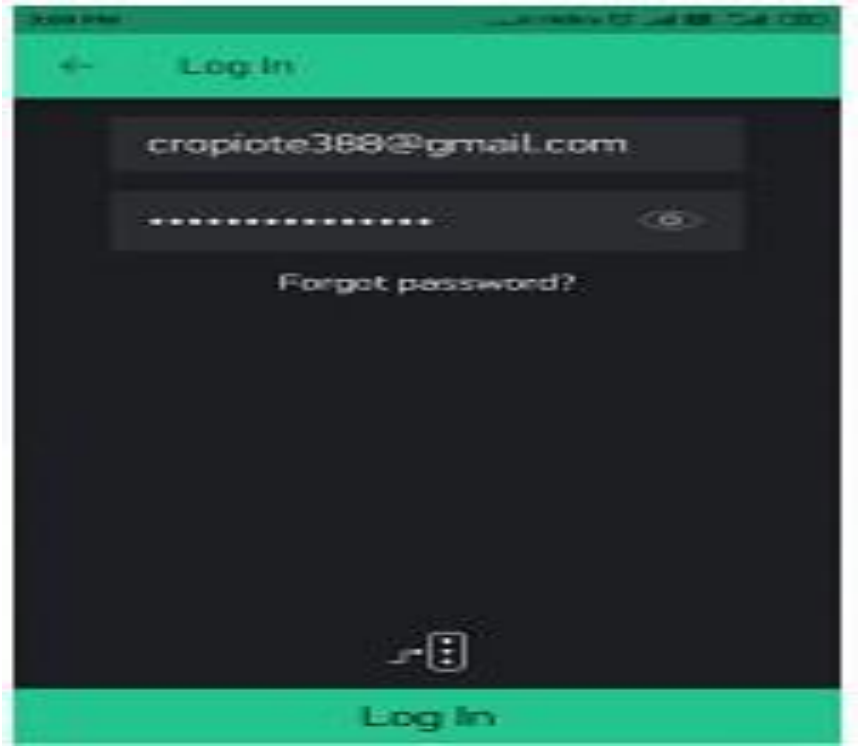

WORKING PRINCIPLE

TheFarmerswhoareneartheForestandHillareasarefacing lotofproblemsbecauseofanimalsattackintheiragricultural land.Theaimofthisdeviceistoprotecttheagriculturalfield by detecting the sensor, Which will be

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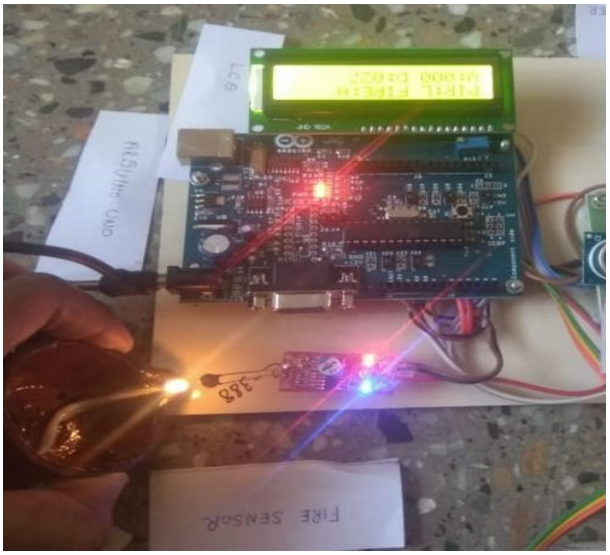
installed in the device and connected with the buzzer that will gives an alert message to drive away the animals and agricultural field will getspreventedfromtheanimalsbycreatingUltrasonicsound frequency.
The PIR sensor is used to sense the intruders of the wild animals for every second to second. The load cell is attached in this device is used to measure the weight of the intruders and wild animals. The fire detection sensor also connectedin thisdevice,tocheckthefirein



caseithappensintheforestor agricultural field. This fire sensor alerts the people that there is a potentialfire.
Once, if there is any instruction of animals is detected by the PIR sensor, the load cell measures the weight of that particular animal, using the controller repeller that has been programmedtoemittheultrasoundfrequency,thissoundthat irritates theanimal.
To drive away, and the flash light gets ON, Due to this flash light and ultrasonic frequency sound the animals will not enter into the agricultural field.
At the sametime, if any animals has been detected by PIR sensororanyfirebeingdetectedbythePIRsensor,theWIFI
module has been connected to the system that will send the information about the animal or fire causes as a data to the field owner or to the Forest department Officer.
Hence, this system helps in saving the agricultural fieldfrom animals as well as device alerts the officer to safegaurd the areas to prevent from animalsattack.

DETECTION OF FIRE

Fire is detected by the Fire detection sensor and fire is active HIGH, in case of any forest fire or fire caused in field this sensor sense the flame and gives the message.

When fire detection sensor in the field detects the fire ,the userwillgetnotifiedintheblynkappthatthefireisdetected.

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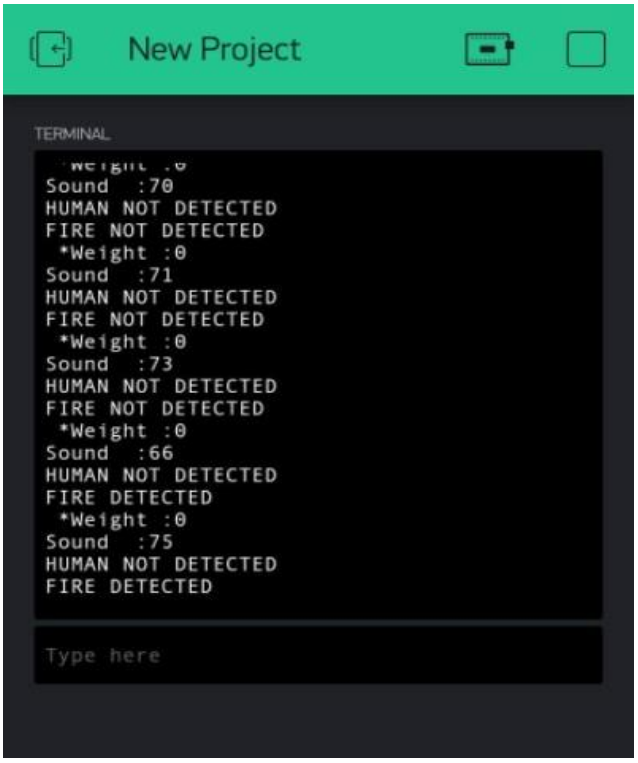

DETECTION OF ANIMALS

When load has been detected, The load exceeds more than 20kg and when no human is detected by the PIR sensor the LED turns ON, the smoke device also turns ON at the same time. The Ultrasonic sensor produces noise which cannot be heardbythehumans,butcanbeheardbytheanimalsanddue to these three factors of ultrasonic sound, LED light as well as the smoke the animals will be drivenaway.

When the weight is displayed above 20 (WEIGHT >20) and when "HUMAN NOT DETECTED", is displayed it means that wild animals have entered the field, by checking the weight > 20 and also the message "HUMAN NOT DETECTED", we can conclude that the animals haveentered thefield.

DETECTION OF HUMAN

PIR sensor active high weight more than 20Kg but the flash, smoke motor do not turn ON because human has been detected, The flash will turn ON only when animals other than the human has beendetected.

When the weight > 20 is displayed and displays that HUMAN DETECTED we can conclude that humans entering the field and notanimals.

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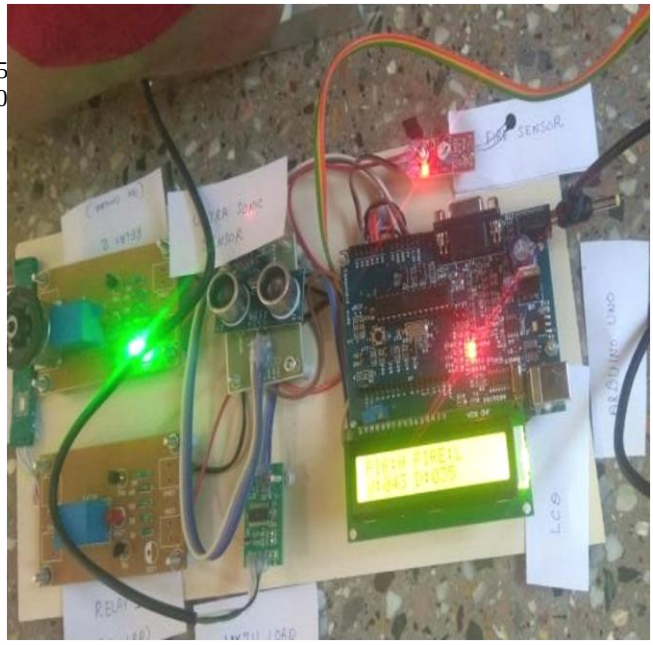

CONCLUSION

Superiority of citizenry of India rely on agriculture. Our farmers are cladding lots of injuries like intruders or animals destroying in agricultural place which eventually lead to economicaffair,starvation,orpoverty.Uptillnowthesekind of conflicts have been stored in National Bulletin. So in this project, the main goal of this device is to virtualized or vigilant agricultural place by installing sensing element whichismergedalongwithbuzzerthatwilldriveoutanimals and prevent them to get in agricultural place, by creating ultrasonicsoundfrequency.Ithasafuturisticprovisionin the device according to therequest.

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FUTURE SCOPE

Thusweexpandasystemofamergedapproachforfire,flood and animal destroy protection system. The sensing element and device produced during the operation are possible to be executed in the real-time. The head of the device is the Atmega parentage of the microcontroller which is outline by simple implant C programming. The discerning value is the keep in touch blaze , fire and flood discerning value . The reporting part in the project is IoT web server merged element which has global security. This build the device obtainable to any region of the world.

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