SMART CROP PROTECTION SYSTEM FOR AGRICULTURE

ABSTRACT

Animals like wild boars, buffaloes, cows, elephant, monkeys, birds, etc. damages the crop a lot which results in loss of production and so of farmer. It is very difficult for a farmer to keep an eye on the field every time. This system is designed to surveillance thE field 24*7 which is not possible for a human being and diverts the animals without harming them. The system uses raspberry pi, PIR sensor to detect animal, camera module to look on animal, GSM module to send alert message to farmer, and a buzzer to divert the animals. This system ensures the safety of farm and decreases the loss of farmers.

INTRODUCTION

Agriculture is the primary source of livelihood for about 58% of India's population. Agriculture is an important sector of Indian economy and it contributes about 17% to the GDP. Agriculture also provides employment to 60% of population. But due to various climatic changes and animal intervention the farmers are facing major losses. There are many traditional methods that are being used by the farmers like scarecrows, electric fences, etc, In some areas farmers uses smoke to prevent their farmland, the burn elephant dung or other materials that create heavy smoke. In some areas people also uses fish or garlic natural emulsion, castor oil to repels the animals. But these are not very effective to save the farms from animals. Hence, we have designed this affordable system to surveillance and to protect the farm effectively.

LITERATURE SURVEY

1. Smart Cropprotection system from living objects and fire using Arduino

This paper motive to designing and executing the superior improvement in embedded device for Crops in farms are over and over ravaged with the aid of nearby animals like buffaloes, cows, goats, birds, andfireplace etc. This results in huge losses for the farmers. It is now not feasible for farmers to barricade complete fields or precede field 24 hours and protect it. Therefore here we present computerized crop safety system from animals and fire. This is a Adriano Uno primarily based device the use of microcontroller. This technique makes use of a motion sensor to discover wild animals drawing near the sphere and smoke sensor to discover the hearth. In such a case the sensor alerts the microcontroller to require action. The microcontroller now sounds an alarm to woo the animals away from the sector further as sends SMS to the farmer and makes call, in order that farmer may fathom the difficulty and come to the spot just in case the animals don't recede by the alarm. If there's a smoke, it immediately turns ON the motor. This provides us entire safety of plants from animals and from fireplace for this reason protecting the farmer's loss.

2. Review on IOT in Agricultural Crop Protection and Power Generation

Agriculture is that the science and artwork of cultivating plants. Agriculture performs most important position inside the economic development of our us of a and this can be the first occupation from a few years. So as to extend the productivity of the crops and to attenuate the expenses of agricultural practices we adopt smart agriculture techniques using IOT. The sensors are placed at different locations within the farm, by which the parameters is controlled using remote or through internet services and by interfacing the sensors operations are performed with microcontrollers. India is that the second most populated country. Power generation and supply is typically an unlimited

problem. This paper mainly addresses power generation and rainwater harvesting as an influence generation method using energy together with crop protection.

3. IOT based smart crop monitoring in farm land

As new technologies has been introduced and utilized in modern world, there is a need to bring advancement in the sector of agriculture also. Various Researches have been undergone to enhance crop cultivation and are widely used. So as to enhance the crop productivity efficiently, it is necessary to monitor the environmental conditions in and around the field. The parameters that have to be exact monitored to enhance the yield are soil characteristics, weather conditions, moisture, temperature, etc., Internet of Things (IOT) is being utilized in a number of real time applications. The introduction of Internet of thing (IOT) along with the sensor network in framrefurbishes the traditional way of farming. Online crop monitoring the use of IOT helps the farmers to stay related to his subject from somewhere and anytime. Various sensors are used to screen and collect records about the area conditions. Collectively the about the farm circumstance is disbursed to the farmer thru GSM technology.

4. Development of IOT based Smart Security and Monitoring Devices for Agriculture

Agriculture area being the backbone of the Indian economy deserves security. Security no longer in phrases of sources solely however additionally agricultural products wishes protection and safety at very preliminary stage, like protection from attacks of rodents or insects, in fields or grain stores. Such challenges should even be taken into consideration. Security systems which are getting used now a days don't seem to be smart enough to produce real time notification after sensing the matter. The mixture of typical methodology with present day technologies as Internet of Things and Wireless Sensor Networks can cause agricultural modernization. Keeping this scenario in our mind we've got designed tested and analysed an 'Internet of Things' based device which is capable of analysing the sensed information then transmitting it to the user. This

gadget will be controlled and monitored from far off region and it is carried out in agricultural fields, grain shops and bloodless stores for protection purpose. This paper is oriented to intensify the methods to unravel such problems like identification of rodents, threats to crops and turning in actual time notification supported records evaluation and processing besides human intervention. During this device, referred to sensors and digital units are built-in using Python scripts. Supported attempted take a look at cases, we had been capable to obtain success in 84.8% check cases.

EXISTING SYSTEM

Traditional electric fence has been helpful as a guard of crops. However, that system has some problems such as it cannot notify the voltage which occasionally drops.Furthermore, the owners of the fence have to check the voltage but they cannot know it without going there .An electric fence management system we develop uses wireless communication, and it enables the owners to know thevoltage and the state of the electric fence and monitor it from remotelocations safely. It describes a demonstrative experiment in a mountainous region, and suggests an approach to resolve some problems. An electric fence system using wireless network technology has been developed. The system consists of several observers and a display Fig.7, the farmers are able to measure voltage at thefence, and have an ability to show it. The observers transmit the voltage with the direction of the voltage leak to the display.Here we are using 2*16 display Fig.7 as shown ,Thedisplay shows the received data and the owners can knowthe state of the electric fence.

PROPOSED SYSTEM

Our project is smart crop protection system Using Arduino. This project is helpful for the farmer to protect his farm from animals and unknown person near to his farm. We are use PIR sensors for sensing the movement at the boarder of farm and that data will be

given to Arduino after processing it can be display on lcd display. But we it is not sufficient to protect the farm hence we can add dog sounds via speaker so that the animals arenot come inside the faram.We are interface nodemcu for message of alert. When any movement detect then we have amessage on our register Android phone. This project is fully works on free energy i.e. solarenergy is store at battery. The battery is connected to our system hence we don't require to give another power supply.We have added new feature to protect our farm byanother issue. When the fire on our farm then we have received a fire message. So this is very protective and costly project. Hence because of our project the farmer can check the security and getimmediate action.
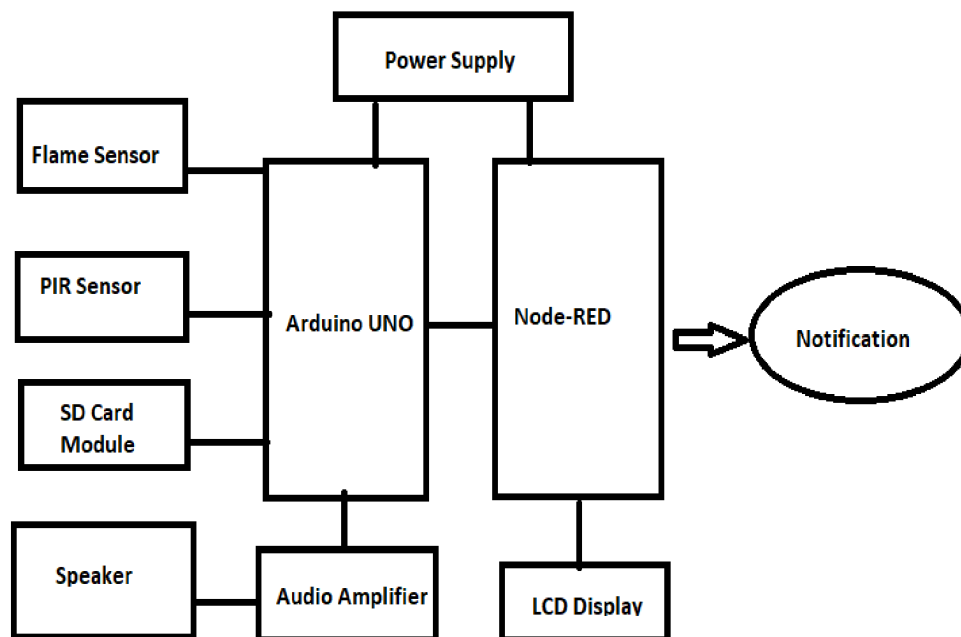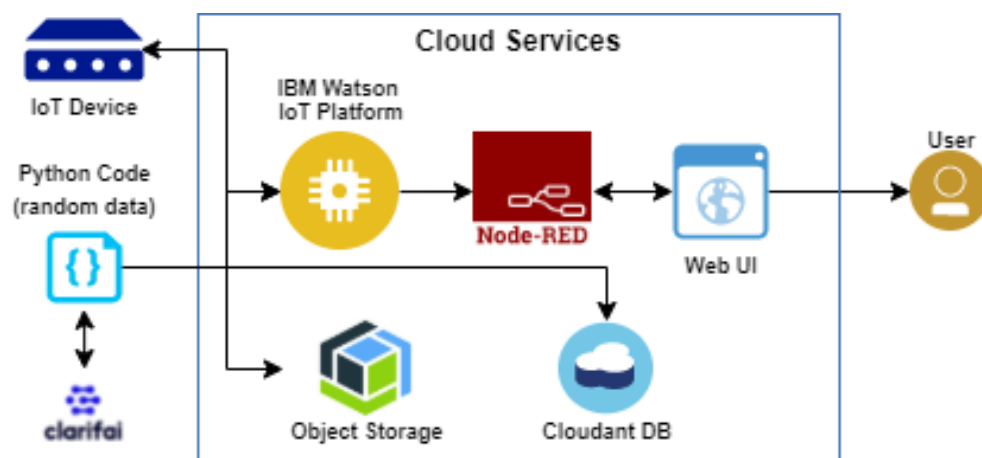
Requirements:

1.Software Requirements:

- Python IDLE
- Node Red
- Ardunio IDE

2.Hardware Requirements:

- Arduino Uno
- NodeMcu
- Flame sensor
- PIR sensor
- SD card module
- Speaker
- Connecting wires
- PCB
- Solar panel

METHODOLOGY

Developing a Smart Crop Protection System from Animals, some steps need to be followed to achieve this successful task. The steps are definable as follows:

- Motion detection
- Image capturing
- Image processing
- Alert generation

Software development of the system is done using Python. Whenever motion is detected, program will capture the image using Raspberrypi Camera. Image captured by the camera will be processed to differentiate between Human and Animal OpenCV library is used along with COCO dataset. OpenCV (Open Source Computer Vision Library) is an open source computer vision and machine learning software library. The MS COCO dataset is a large detection, segmentation, and captioning dataset published by Microsoft. Understanding visual scenes is a primary goal of computer vision; it involves recognizing what objects are present, localizing the objects in 2D and 3D, determining the object's attributes, and characterizing the relationship between objects. Therefore, algorithms for object detection and object classification can be trained using the COCO dataset. If the captured image is of Animal then buzzer will be turned on in the farm to scare the animals and an alert email will be sent to the farmer along with the captured image for the verification. If Human presence is detected then the program will continue to detect the motion.

OBJECTIVE

- The main objective is to protect the crops in farm area from animals.

- IR sensor detects the animal while crossing it, by sensing the movement of the animal and ultrasonic sensor detects the birds entering in the fields**.**
- This system will continuously check for any animals entering inside the field.

CONCLUSION

In India many times farmers face huge loss just because of animals. Hence, to overcome this issue, the designed system produces the sound to scare the animals, so that animals will automatically ran away. The main aim is to prevent the loss of crops and to protect the area from intruders and wild animals which poses a major threat to the agriculture areas. The GSM module is used to make a call to the farmer to alert him. Therefore, the designed system is affordable and useful to the farmers. The designed system won't be harmful to animals and persons and it protects the farm areas.The system is capable to protect the farm in day and night with IOT monitoring.

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