IOT Based Smart Crop Protection For Agriculture

ABSTRACT

Low productivity of crops is one of the main problems faced by the farmers in our country. This can be because of two main reasons. Crops destroyed by wild animals and because of bad weather condition. This paper provides a solution to the destruction of crops by animals. This system will provide a complete technical solution using the Internet of things (IOT) to the farmers to prevent their crops from wild animals and provide information to the farmers to maximize their production. Animals are detected using PIR sensors and cameras where animals are identified using TensorFlow image processing Techniques. Raspberry Pi is used as the processing unit of the system and sound buzzers are used to emit the ultrasound frequencies.

INTRODUCTION

In recent decades, the livelihood of many farming communities in the country has come under threat from the attacks of wild animals on crops. Heard of stray animals often enter to fields and destroy the crops which result in loss of crops for farmers. The currently available systems use a different type of methods like using loud noises, alarming conditions to prevent the animals from entering or destroying the crop field. In some systems, the animals are only detected using PIR sensors and notification is sent to the farmers. These systems are not reliable with different types of animals. In this proposed work, we are introducing an IOT based system which is simple, reliable and cost efficient to over come the problem faced by the farmers.

LITERATURE SURVEY

1. Ramaprasad S, S .Sunil Kumar, B S Sivaprasad Lebaka

"Intelligent Crop Monitoring and Protection System in Agricultural fields Using IoT"

IoT is gaining an important place in research across the nook and corner of this world especially in area of modern wireless communications. One of main areas where IoT based research is going on and new products are launching on everyday basis to make the activities smarter and efficient towards better production of crops in agricultural sectors. IoT is an integration of wireless sensors with agricultural mobile apps and cloud platforms helps in collecting vital information pertaining to the pertaining to the environmental conditions temperature, rainfall, humidity, wind speed, pest infestation, soil humus content or nutrients, besides others linked with a farmland, can be used to improve and automate farming techniques, take informed decisions to improve quality and quantity, and minimize risks and wastes. To supervise above mentioned parameter we have used some of the smart devices like sensors and also internet, through internet all devices are connected and controlled.

Requirements

- Arduino Microcontroller
- Sensors
- DHT11 sensor and IR sensor.
- Soil Moisture Sensor
- Motor Pump
- Wi-Fi Module

Advantage

➢ This system uses intelligent irrigation system to get good

➢ Intelligent irrigation system will increase the crop quality and increases the productivity by the use of sensors like, soil moisture, air temperature, humidity and water level of the tank.

➢ This concept of irrigation system reduces the manpower to water the crops especially during night time because in villages power will be available during night time.

➢ This is system can be used for multiple crops using multiple moisture sensors using single MCU, which can monitor various parameters of different crops

➢ In our system we are using PIR sensor to detect the Human, Intruder or any animal, if any intruder coming to the agriculture filed

➢ It uses optimal usage of water in-turn it saves the water and also power consumption.

2. Prof K.A. Patil, N.R. Kale
proposes about a model for "Smart Agriculture using IOT"

Climate changes and rainfall has been erratic over decade. Due to this, climate-smart methods called smart agriculture is adopted by many farmers. In the existing system, village farmers may have planted the same crop for centuries, but over period, weather patterns and soil conditions and epidemics of pests and disease have been changed. By using the proposed system approach, which senses the local agricultural parameters, identify the location of sensor, transfer the data crop fields and crop monitoring. The Received updated information allows the farmers to cope with and even benefit from these changes. The Complete real-

time and historical environmental information is expected to help to achieve efficient management/monitoring and utilization of resources.

Existing System

Threshold values for climatic conditions like humidity, temperature, moisture can be fixed based on the environmental conditions of that particular region. The system also senses the invasion of animals which is a primary reason for reduction in crops. This system generates irrigation schedule based on the sensed real time data from field and data from the weather repository.

Hardware Requirements

- Raspberry Pi
- Arduino UNO R3
- Sensor for particular usage(soil, temperature, moisture)

Software Requirements

- Arduino
- Cloud application
- Data base of record

Advantages

By comparing the previous year record of cropping, farmer enhance the soil quality and quantity Management of cropping are efficiently done through these process.

3.P. Rekha et al

"IOT BASED SMART CROP PROTECTION SYSTEM FROM ANIMALS"

Proposed a system for preventing agricultural land from animal and automated irrigation system. By using arduino, GSM module, IR sensor and soil moisture sensor, senses the environmental data and send to arduino. This system makes the use of IR sensor for detection of animals and soil moisture sensor to find the moisture of soil and automatically control the water pump for auto irrigation system. But this system does not utilize advanced technologies for alerting the farmer and detection of animals in farm

Hardware Requirements

1.Raspberry pi 3 B+

- Broadcom BCM2837B0, Cortex (ARMv8) 64-bit SoC @ 1.4GHz

- 1GB LPDDR2 SDRAM

- Extended 40-pin GPIO header

- Full-size HDMI

- CSI camera port for connecting a Raspberry Pi camera

- Micro SD port for loading your operating system and storing data

- 5V/2.5A DC power input

- Power-over-Ethernet

2 Big Dome PIR Motion Detector Module

- Supply Voltage DC 5V

- Quiescent Current: 65uA

- Level output: High 3.3 V /Low 0V

- Operation Temp: -15-+70 degrees

- Using pyroelectric PIR sensor, Fresnel

- 3-5 m sensing range

- 110 degree angle sensor

3.5MP Raspberry Pi 3 Model B Camera

- Resolution: 5 MP

- Interface Type: CSI(Camera Serial Interface)

- Supported Video Formats: 1080p @ 30fps, 720p @ 60fps and 640x480p 60/90 video

4. Buzzer

5Flashlight (PoE) support (requires separate PoE HAT)

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

Advantage

➢ 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

4 Gogul Dev N S, Sreenesh K S, Binu P K
"IoT Based Automated Crop Protection System"

The destruction of crops by wild animals is one of the main problem faced by farmers. Thus this project carries the solution to prevent the animals from entering the crop field. Hence we have designed an IoT based system which is cost efficient and consumes less energy. Since the system uses ultrasound frequencies to prevent the animals from entering the crop field, it won't disturb the people living in the nearby area. Such a system will help the farmers to protect the fields and also save them from critical financial losses**.**

Requirements

- Pir Sensor And Camera
- Raspberry Pi
- Ultrasound Speakers
- Ultrasound Detector
- Frequency Generator