IOT Based Secured Farm System

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Abstract- Technology is a major part of our daily lives. The Internet of Things (IoT) is in high demand across a wide range of industries, and this has attracted both industry and academic research interest. Smart farming and precision agriculture are just two examples of the innovations brought about by the implementation of IoT in the agriculture sector. The creation of an Internet of Things application for crop protection is presented in this paper in order to stop animal incursions into the crop field. To stop possible damages in agriculture from weather and wild animal attacks, a repellent and monitoring system are offered.

***Keywords*- Crops, Animal, Damage, Protection, Security.**

1.INTRODUCTION

Crop vandalism, or the issue of wild animals attacking crop fields, is becoming very common. Phenomenon that exists in many states, including Maharashtra , Uttarakhand, and Tamil Nadu, Kerala. Monkeys, stray animals (particularly cows and buffaloes), wild dogs, nilgais, bisons, elephants, deer, and wild pigs are examples of wild animals. And even birds like parakeets seriously harm crops by either destroying them with their teeth or running over them. This results in a low crop yield. These animals attack fruit orchards, destroying the fruits and flowering plants. The farmers and orchard owners suffer large financial losses as a result in both situations. Because of these animal attacks, farmers sometimes choose to abandon the area, highlighting the severity of the problem.

Crop damage caused by animal attacks is one of the major threats in reducing the crop yield. In the agriculture sector alone, the deployment of IOT has led to smart farming, precision agriculture, just to mention a few. This System presents the development of Internet of Things application for crop protection to prevent animal intrusions in the crop field. A repelling and a monitoring system is provided to prevent potential damages in Agriculture from wild animal attack.

2. LITERATURE SURVEY

In their proposed effort to address the problem of farm vandalism, M. Jaya Prabha et al. designed a system that played sound to frighten the animals and birds, causing them to flee instinctively [1]. In order to address the problem of wild animals stealing agricultural crops and ruining farmers' livelihoods, Sonal D. Khandare et al. propose work in their proposal [2]. This system relies on solar fencing, loud noise systems, and SPV for protection. In their proposed work, Atchaya V. et al. use an IoT-based farm monitoring and protection system with a Noise Repelled Device (NDR) [3]. In their proposed work, Mr. D. Meghan nathan et al. use a PIC microcontroller with a motion sensor to detect and sound an alarm to entice animals away from the field [4]. In this proposed system, Omkar Kekre et al. focus on three farmland [5]. P. Rekha et al. suggested an Arduion and GSM-based system to protect farms and notify farm owners by sending SMS [6].

3. SYSTEM OBJECTIVE

The primary goal is to keep animals away from the crops in agricultural areas. When an animal crosses a field, an infrared sensor tracks its movement, and an

ultrasonic sensor finds the birds as they fly into the fields. This system will keep an eye out for any animals that might be entering the field.

4. EXISTING SYSTEM

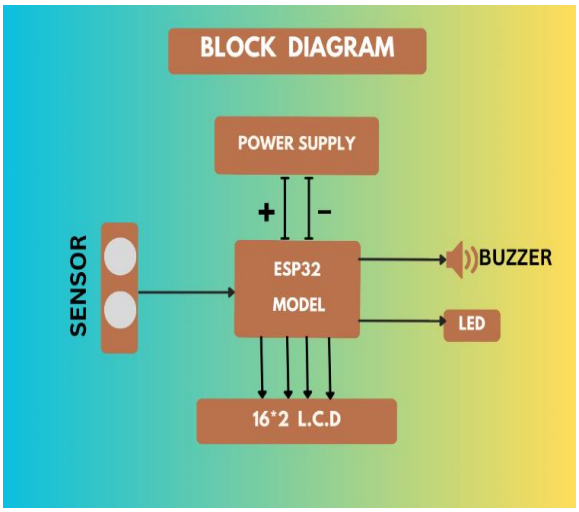
In the past, farmers used an ineffective method of keeping out wild animals, though it was somewhat effective in keeping out birds, by erecting human puppets and effigies on their farms. Other frequently employed strategies by farmers to stop animals from damaging their crops include the construction of physical barriers, the deployment of electric fences, fire crackers, and manual surveillance, among other risky and labor- intensive techniques.

5. PROPOSED SYSTEM

The proposed system involves the placement of sensors within the agricultural field to monitor crops. In the proposed work, ultrasonic sensors use sonar to measure an object's distance and movement. The ESP32 microcontroller, acting as the project's brain, receives this data and sends an acting reaction to the IoT (Internet of Things) WiFi module, producing a loud noise from the buzzer that annoys the animal and makes it go away. It will simultaneously send the farm owner an SMS from the farmland. The ESP32 microcontroller-powered farm watchman machine is the name of the entire system. The farmer must have an Android-based smartphone in order for this system to work, and the Blynk app will help the application develop on that phone. This project benefits farmers since it eliminates the need for farmers to stay on the field 24 hours a day, seven days a week.

If motion is detected after processing, the ultrasonic sensor will detect movemennt happening around the farm land After getting that initial input signal, it will be given to the microcontroller for further processing and the system will be activated immediately, and ESP32 model connected to the ultrasonic sensor will and the sound is being played to divert the animal, at the same time it will send message to owner. The alert message will automatically send on farmers mobile which we have connected with the blynk server and the farmer will let know that someone is near their field. Whole process is controlled by microcontroller.

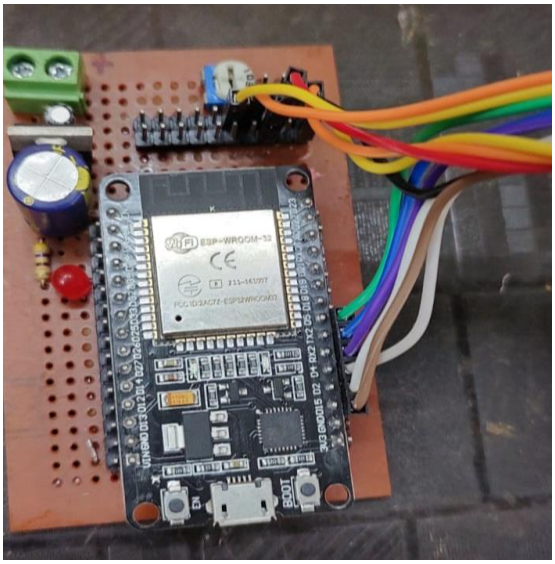
6. BLOCK DIAGRAM



The proposed system is classified into four parts – DC power supply part, sensor part, controlling part, alarm part. DC power supply part consists of an ac supply of 12v. The sensor part consists of two IR sensors and ultrasonic sensor. This part senses the movement of animals and birds. Next controlling part which consists of a comparator which receives input from the IR sensor, it gives constant voltage and feeds the Arduino with the signal. And the blynk application installed on owners phone.

7. HARDWARE

A. ESP32 microcontroller.



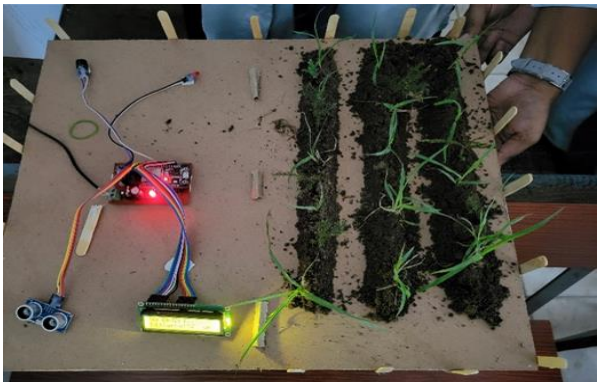
B. Ultra Sonic Sensor.

C. 12v Adaptor.

D. Buzzer

8. HARDWARE RESULT

Once an animal or bird is detected, the speaker turns on, and the recorded sound plays continuously at a time. Through the Blynk App, which is installed on the farmer's mobile device, the farmer can control hardware and send messages to the Blynk Cloud.



CONCLUSION

In recent years, crop vandalism caused by wild animals and moisture has grown to be a significant social problem. Given that there is currently no workable solution to this issue, it needs to be addressed right away. Because this project seeks to address this issue, it has a high social impact. In addition to saving farmers money, this project will help them safeguard their fields and orchards. They will also be able to increase crop yields thanks to this, which will improve their financial situation. These sensors can detect farmland from anywhere in the globe and gather data that is helpful to farmers. It helps farmers grow more crops. More crops mean a healthier life, and more crops mean less labor.

FUTURE ENHANCEMENT

There will be a lot more scope for this project in the future, and wireless networks can be the basis. Wireless sensor networks and various types of sensors are used to gather data about crop conditions and changes in the environment. The farmer receives this data via the network and uses it to start corrective action. Farmers have access to information and are aware of global agricultural conditions at all times.

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