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IOT Based Crop Protection System from Animals

M. Sai Ganesh[1], K. Avinash Sekhar[2], Ch. Kalyan Kumar[3], M. Yashwanth[4], A. Kavya[5]

[1] Assistant professor,[2,3]UG Students, Department of Electronics and Communication Engineering, DVR & Dr. HS MIC College of Technology, India
[4,5]UG Students, Department of Electronics and Communication Engineering, DVR & Dr. HS MIC College of Technology India

ABSTRACT:

The main aim of this project is to protect the crops from birds and wild animal attacks.The most essential need for all living things is food. Agriculture is the primary source of our food, either directly or indirectly. The security of the agricultural land is crucial today. Animals and birds frequently destroy crops on farms, resulting in significant losses for farmers. Farmers deal with a new kind of issue every day. The main issue with agriculture is birds because they consume crops when they fall on them. Farmers are unable to defend their fields for a full day.

A bird and animal detection system has been created to identify the presence of both birds and animals in order to address this issue. without injury, issues a warning and directs the animal. The device is set up to scan the entire area continually for any birds or other animals.

Animals and birds can hear at particular frequencies. A special logic is used to estimate the annoyance frequency at dawn and dusk while birds are eating rice seeds, ragi crops, maize, wheat, etc. from the crops. In order to irritate birds and flay outside the field, we can produce a loud noise. We can lessen the issue that affects agriculture the most by employing this concept.

A motion detector, an electrical device that uses a sensor to detect nearby motion, is used in this circuit. A system that automates a process or alerts a user to motion in a space frequently includes such a gadget as a part. PIR sensor, power supply, buzzer, resistor, and transistor are the circuit's primary components.

***Index terms*- PIR Sensor, Microcontroller, LCD Display, APR Voice Player , MATLAB, GPS Module, GSM Module**

INTRODUCTION

The economy's most important industry is agriculture, and farmers must overcome many obstacles to ensure strong agricultural harvests. The harm that birds and other wild animals do to farmers' crops is one of their biggest problems. Physical barriers and chemical repellents are two common means of crop protection, however they are not always efficient and can be costly.

An IoT-based crop protection system has been created to solve this issue and provides farmers with a practical and affordable solution. To identify and stop bird and wild animal attacks on crops, the system combines sensor technology with deterrents and video technology.

Infrared, motion, and vibration sensors are all utilised in the system to detect the presence of birds and other animals. The device generates deterrents like ultrasonic sound and flashing lights to frighten the intruders away once the sensors identify them. The system also has a camera that records photographs of the intruders, allowing for the identification of the species and the patterns of behaviour.

Machine learning techniques are used to examine the data gathered from the sensors and camera in order to find patterns in the behaviour of birds and other animals. Improved crop protection techniques can be created using the analysis to stop more attacks.

IoT-based crop protection system provides farmers with a complete way to safeguard their crops against attacks from birds and other wild animals. The system is suitable for farmers of all sizes because it is made to be affordable, effective, and simple to operate.

The system employs a range of sensor technologies, including infrared, motion detection, and vibration sensors, to find animals and birds. For optimal coverage, these sensors can be installed on and around the farm.

Deterrents: When the sensors pick up the presence of animals or birds, the system triggers deterrents such flashing lights, ultrasonic sound, and water sprays to frighten them away.

The Animals and birds can be startled by ultrasonic sound and flashing lights without suffering any harm. Technology utilising a camera: The system has a camera that takes pictures of intruders. The camera may be used to recognise different bird and animal species as well as their behavioural patterns. Crop protection methods can be developed using the information gathered by the camera.

Data analysis: To find patterns in the activity of birds and other animals, python techniques are used to examine the data gathered by the sensors and camera. Improved crop protection techniques can be created using the analysis to stop more attacks.

Integration with farm management systems: To offer real-time data concerning crop protection, the IoT-based crop protection system can be integrated with already- existing farm management systems. By integrating the two systems, farmers may improve their agricultural practises and make educated decisions on crop security.

LITERATURE SURVEY

The literature on IoT-based plant protection systems against bird and wildlife attacks is relatively new and there is little research in this area. However, a number of studies have been conducted and the following literature review summarizes some of the most important findings.

A study published in the Journal of Applied Remote Sensing evaluated the effectiveness of an IoT-based bird detection system for crop protection. The study found that the system was effective in detecting and deterring birds, resulting in reduced crop damage.

Another study, published in the International Journal of Advanced Research in Computer Science and Software Engineering, proposed an IoT-based system to protect crops from wild animals. The proposed system used infrared sensors, cameras and deterrents to detect and prevent animal attacks.The study concluded that the system was effective in reducing crop damage .

A review article published in the Journal of Agriculture and Environmental Sciences discussed various technologies and approaches that can be used in plant protection, including IoT-based systems. The article highlighted the advantages of IoT-based plant protection systems, such as cost-effectiveness, efficiency and ease of use.

The study concluded that the system was effective in protecting crops and reducing losses. literature suggests that an IoT-based plant protection system against bird and wildlife attacks is a promising technology to help farmers protect their crops effectively and efficiently.

The system has shown positive results in reducing crop damage and increasing yields. However, further research is needed to assess the long-term effectiveness of the system and identify potential limitations

EXISTING SYSTEM

To stop assaults from wild animals, boundary walls and solar fences are constructed around the vulnerable locations. However, this arrangement prevents the animals from being independent or having a wide range of mobility. In order to redirect wild animals onto an alternative path without obstructing car traffic, overhead or subsurface structures are erected. However, this approach is more labor-intensive, takes longer to complete, and is neither efficient nor acceptable. To better understand the movements and habitat use patterns of lions, tigers, elephants, olive riley turtles, and other wild animals, research institutions are using a variety of information technology tools, such as radio collars with extremely high frequencies, the global positioning system, and satellite uplink facilities.

PROPOSED SYSTEM

A proposed IoT-based crop protection system against bird and wildlife attacks would use sensors, cameras and deterrents to detect and prevent animals from entering a crop field. The system is designed to operate independently without human intervention

The proposed system would consist of the following parts:

Sensors: The system would use a combination of infrared and motion sensors to detect birds and wildlife in the crop area.

Cameras: The system uses high-resolution cameras to record images and videos of intruders. The cameras would be strategically placed to cover a large area.

Deterrents: The system would use a combination of deterrents such as loud noises, flashing lights and mild electric shocks to determine intruders.

Internet of Things (IoT) Platform: The system would be connected to an Internet of Things platform that would allow farmers to control the system remotely.

The platform would also provide real-time alerts and notifications when an intrusion is detected.

When the sensors detect an intruder, the cameras record images and videos of the intruder. The IoT platform would analyze data from sensors and cameras and determine the type of intruder. Appropriate deterrence is activated based on the type of intruder detected. For example, loud noises would be used to scare away birds, while electric shocks would be used to repel wild animals.

The farmer would be notified of the intrusion through the IoT platform and could monitor the system remotely so that preventive measures are effective. Overall, the proposed IoT-based plant protection system against birds and wild animals would provide farmers with a cost-effective and efficient solution to protect their crops. The system would help reduce crop losses due to animal incursions and improve yields.

WORKING METHODOLOGY AND BLOCK DIAGRAM

The IoT-based crop protection system against bird and wild animal attacks is a complex system that uses sensor technology, warning devices and camera technology to detect and prevent crop attacks. The method of this system is as follows:

Sensor placement: The first step in deploying an IoT- based crop protection system is to identify the areas where sensors need to be placed. Sensors can be placed in and around the farm to achieve the best possible coverage. The system uses infrared, motion and vibration sensors to detect the presence of birds and wildlife.

Deterrents: When sensors detect the presence of birds and animals, the system activates alerts such as an ultrasonic sound, flashing lights and water jets to scare them away. These obstacles effectively repel birds and animals without causing damage.

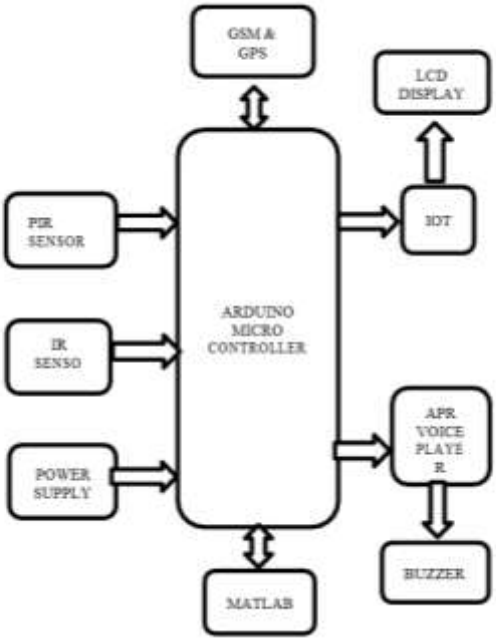
Camera installation: The system includes a camera that takes pictures of intruders. The camera can be placed in strategic places to photograph birds and animals.

The images taken can be used to identify species and their behavior patterns.

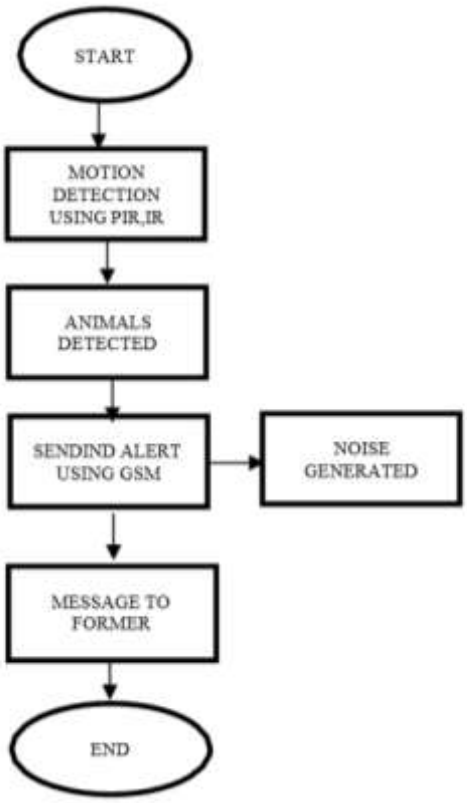
Data collection and analysis: The data collected by the sensors and camera are analyzed using machine learning algorithms to identify behavioral patterns of birds and animals. This analysis can be used to develop better strategies to protect crops and prevent future attacks.

Integration with farm management systems: The IoT- based plant protection system can be integrated with existing farm management systems to get real-time crop information to protect This integration can help farmers make informed crop protection decisions and optimize their farming practices.

Maintenance and monitoring: The system requires regular maintenance and monitoring to ensure that it is working properly. Sensors, cameras and warning devices should be checked regularly to ensure they are working properly. In summary, an IoT-based crop protection system methodology against bird and wildlife attacks includes sensor placement, deterrents, camera installation, data collection and analysis, integration with farm management systems, and maintenance and monitoring. This comprehensive method ensures that farmers can effectively and efficiently protect their crops.



Flow chart for Crop Protection System:



RESULT:

CONCLUSION:

Farmers in India's rural areas face serious risks, such as animal damage. In order to solve this problem, a system that plays sound while detecting the light intensity using an LDR and focusing the light if necessary has been developed. in order to prevent wild animals from entering the farm. It's going to flee. The farmer is informed through message from the GSM module. This leads to the conclusion that the design system is very beneficial to farmers and reasonably priced. The design system will safeguard farms and not endanger people or animals.

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