SMART CROP PROTECTION AND ALERTING USING MICROCONTROLLER AND GSM MODULE

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ABSTRACT

Farmers all across the world confront a huge difficulty when it comes to crop protection against animals. Effectiveness, scalability, and sustainability are issues with traditional solutions like fences, scarecrows, and chemical repellents. In order to protect their crops, farmers are also unable to spend the entire day in the fields. In order to prevent agricultural damage brought on by animals, this study suggests a smart crop protection system that makes use of Arduino-based technologies. To identify the presence of animals, initiate the proper responses, and provide real-time monitoring and control, the system integrates sensors, actuators, and data processing capabilities.

INRODUCTION

Animals, such as deer, rabbits, birds, and other pests, frequently cause damage to agricultural fields that reduces their ability to produce food. The consumption of crops, mutilation of vegetation, and trampling of plants by these animals can result in significant economic losses. Traditional crop protection techniques frequently involve a lot of work, take a long time, and demand constant observation. Electronic technology developments in recent years, like Arduino, have created new opportunities for creating intelligent, automated solutions to these problems. A increasing number of people are now interested in creating smart agriculture solutions to help farmers overcome their numerous difficulties. These solutions take advantage of technological improvements to build automated, intelligent systems that can enhance agricultural operations, boost output, and reduce losses. Arduino is one such technology that shows potential in the area of crop.platform for open-source electronics Arduino provides a flexible and user-friendly platform for creating interactive projects. The tool, made up of a micro controller board and a development environment, allows users to programme and control a variety of electronic components and sensors. Ingenious techniques can be developed by farmers to better and more efficiently preserve their harvests. platform for open-source electronics Arduino provides a flexible and user-friendly platform for creating interactive projects. The tool, made up of a micro-controller board and a development environment, allows users to programme and control a variety of electronic components and sensors. Ingenious techniques can be developed by farmers to better and more efficiently preserve their harvests.

LITERATURE SURVEY

The article is written based on Protection of crops from animals using intelligent surveillance . The suggested method uses the Fourier transform for segmentation and object identification in order to recognize animals.

In the narrative, a smart farm employs a Raspberry Pi to guard against crop loss and animal intrusion. The proposed system does this using a GSM (Global System for Mobile) modem and an RFID (Radio Frequency Identification Device) module. These SMS, which will be issued to farmers and forest officers, will include the area that the animals watch. The article which is based on IOT Solutions for protection of crops. They demonstrated how heterogeneous sensors and actuators may coordinate with one another and the cloud to create a platform that would enable the development of new services in this field.

RELATED WORK

In First Paper. A low-cost security system was built for the project under consideration. It has a smoke sensor and a passive infrared sensor. It receives the signal produced by the PIR sensor and sends the information to the micro-controller. Additionally, there are sirens. When a fire is detected by the smoke sensor, the DC motor will switch on. It also includes a GSM module that is automatically included and utilized to locate the field.

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EXISTING METHOD

Motion sensors positioned thoughtfully throughout the field are one existing technique for smart crop security from animals using Arduino. When an animal enters the sensor's field of vision, it sets off an alarm or activates a deterrent device, like flashing lights or a loud noise. Although this procedure is reasonably straightforward and inexpensive, it may not be accurate in classifying the species of animal and may result in false alarms.

Today, agricultural yields represent a variety of fields that exist on a global scale. The goal of this project is to estimate any crop- or animal-related problem and then determine the best course of action. The output of agricultural crops is being decreased by wild animal attacks. One of the most urgent issues we currently confront is animal attacks in agriculture. Farmers experience severe suffering as a result of animal attacks. People have occasionally died while trying to remove animals from their homes. Animals migrate to agricultural land as a result of deforestation and a shortage of water supplies in woodland areas.

PROPOSED METHOD

Multiple sensors and cutting-edge approaches can be incorporated into a suggested system for smart crop security against animals utilizing Arduino to improve accuracy and efficacy.

Surveillance is essential in many places, including the home, hospitals, schools, public places, farms, etc. It gives us the ability to monitor a specific area, prevent theft, and also provide proof of evidence. Surveillance is essential on farms and agricultural fields to prevent unlawful entry and protect the area from animals. Animals that eat their crops are these farmers' main adversaries, but we frequently forget that varied methods only concentrate on surveillance, which is largely for human intruders. Crop output is poor as a result, and agricultural owners suffer significant financial losses. This issue is so severe—frequent animal attacks—that occasionally farmers decide to leave the locations.

BLOCKDIAGRAM

In this block diagram we using the Atmega328 When reading analogue or digital input signals from various sensors, the Arduino, which has a 5 volt operating voltage, converts them into outputs like turning on a motor or a light, among other things. We are using a 2 volt, 1 amp AC-DC adaptor to supply the power. The sensors which we are using are IR sensor which is used for detecting the motion of the objects like if in case there exist a presence of animal then it detects through motion and alert the owner through gsm , soil moisture sensor which is used for monitoring the soil moisture level if in case the soil is in dry condition then the sensor automatically turns on the water from water pump, fire sensor which is used to detect the fire if in case the is short circuit in the fields there may cause fire in the fields to avoid it we are using flame sensor, the electric fence is a traditional method such that if any animal is collides with the fence then there exist short circuit in the fence turn on the alarm through buzzer sounds and alerts the owner through gsm.

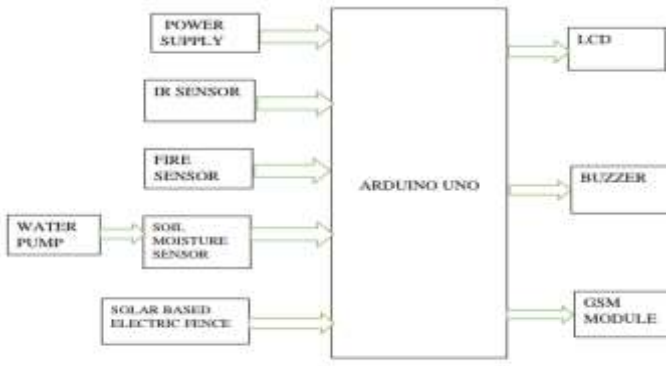
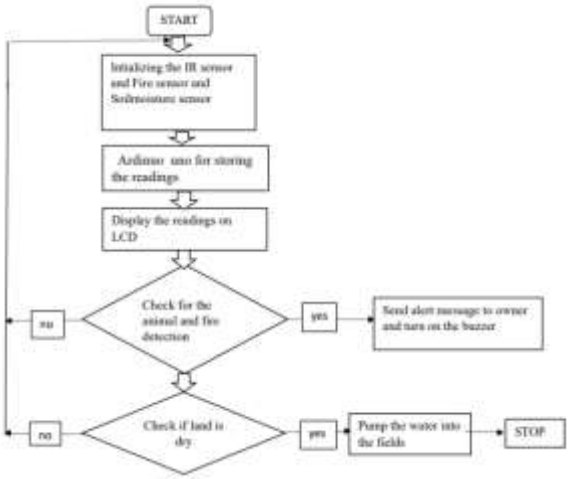


Fig :1:Block diagram of smart crop protection from animals

FLOW CHART



RESULT

The precise design, implementation, and environmental elements would determine the outcomes of using Arduino to construct a smart crop security system against animals. It's crucial to remember that the real outcomes and efficacy of a smart crop security system using Arduino may differ based on elements like the precision of animal detection, the selection of deterrent devices, environmental circumstances, and the implementation competence. To attain the intended results, extensive testing, fine-tuning, and optimization are required.

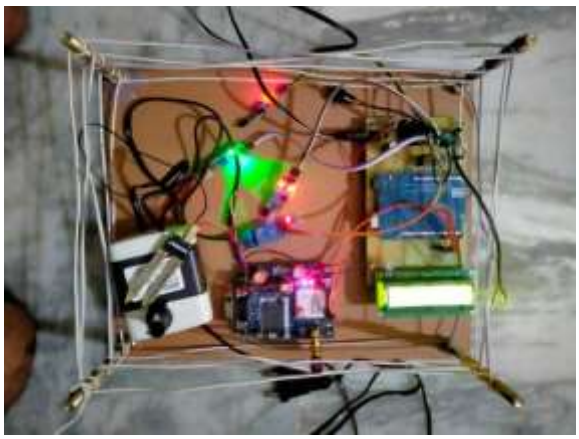


Fig :2: final result of the project

Fig :3: showing phone call and sms alert

CONCLUSION

In conclusion, smart crop protection using Arduino technology offers a promising solution to the age-old problem of animal damage in agriculture. By combining sensors, actuators, and a micro-controller, farmers can effectively detect and deter animals from encroaching on their crops.

The use of Arduino allows for real-time monitoring and automation, ensuring timely responses to potential threats. Sensors such as motion detectors and moisture sensors can detect the presence of animals and trigger appropriate actions. These actions can include activating deterrent devices like flashing lights, sirens, or water sprayers to scare away the animals.

The Arduino platform also enables data collection and analysis, providing valuable insights into animal behavior patterns, which can be used to refine protection strategies. Farmers can track the frequency and intensity of animal encounters, allowing for better planning and resource allocation.

Furthermore, Arduino's open-source nature fosters innovation and collaboration among farmers, researchers, and developers. This means that new features, improvements, and techniques can be shared and implemented rapidly, leading to continuous advancements in smart crop protection.

Overall, smart crop protection using Arduino offers an effective and sustainable approach to minimizing animal damage in agriculture. It empowers farmers with real-time monitoring, automation, and data-driven decision-making, resulting in increased yields, reduced losses, and improved resource efficiency. With further advancements and widespread adoption, this technology has the potential to revolutionize the way we protect crops from animal threats, benefiting farmers and the global food supply.

FUTURE SCOPE

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