A NOVEL APPROACH OF INTELLEGENT SECURITY SYSTEM TO PROTECT FARM LAND FROM WILD ANIMALS

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ABSTRACT

Crops are vulnerable to wild animals.Therefore it is very important to monitor the nearby presence of animals. Then the actuation of various devices should follow to repel the hazardous animals. Traditional methods uses electric fence which is hazardous to animals. In this paper, we have proposed a method to protect farms from wild animals via well improved security system in addition to the traditional methods by replacing some of the features to improve protection. We have replaced the hazardous electric fence with sensors to protect the valuable lives of wild animals. In addition to sensors we also have used cameras which will alert forest officers in critical situations. GSM module which used in our project will sent an alert message to forest officer and farmers in the localities if any wild animal crosses the forest limit. Flash light threatens the wild animal along with threatening sound is produced by the buzzer.

Keywords:crops,vulnerable,wild animals,monitoring,flash light,buzzer,etc...

I. INTRODUCTION

In the world, the economy of many countries is dependent upon agriculture. In spite of economic development agriculture is the backbone of the economy. Agriculture is the main stay of economy. It contributes to the gross domestic product. Agriculture meets food requirements of the people and produces several raw materials for industries. But because of animal interference in agricultural lands, there will be huge loss of crops. Crop will be totally getting destroyed. There will be large amount of loss of farmer. To avoid these financial losses it is very important to protect agricultural field or farms from animal. To overcome this problem, in our proposed work we shall design a system to prevent the entry of animals into the farm. Our main purpose of project is to develop prohibitive security system to the farm, to avoid losses due to animals. These prohibitive security system protect the crop from damaging that indirectly increase yield of the crop. The develop system will not harmful and injurious to animal as well as human beings. Theme of project is to design a intelligent security system for farm protection by using Embedded system

II. LITERATURE SURVEY

1. Prof. Abhinav V. Deshpande[1], proposed a system which offers a solution to the problem for prootection of farm land from wild animals.fencing wire is used as a sensor. When animals come in contact with this open cable the circuit will be grounded and we get initial input signal that indicates presence of animals at fencing. After getting that initial input signal followed by amplifier circuit passed it for further processing. Then it will be given to the microcontroller.Thier system will be activated, immediately buzzer will be on. The GSM module is used for sending SMS to farmer when threshold gets cut off. It alerts the farmer that some animals try to enter into the farm. LCD use to Display values of ADC of microcontroller, from where we know we get the initial input to our system. Our LCD data will be display for SMS sending .There will be keypad for changing the setting of system. Relay and its driver are used for torch controlling.

2. TanmayBaranwal, Nitika[2], describes the study of aninnovative method

In the proposed scenario, the research problem is to develop intelligent security systems with ability to analyze data and transmit information over network to the remote location. Literature survey gives the notion about present work done in field of agriculture security and IoT. This can be enhanced by integrating few new technologies with present scheme. Current IP based CCTV security cameras require network connectivity for monitoring from remote location. It doesn't has ability to notify user by analyzing data. In the device, basic sensors and electornic devices are used. The sensory information are analyzed in order to activate electronic devices and raspberry pi is used as a server to analyze data and transmit information to user.

3. [1]ThyagarajuDamarla [2] Asif Mehmood.Non-imaging sensors offer low power

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and longlasting solutions for perimeter, border crossing, and forward operating base protection. In this paper, we study the utility of acoustic, seismic, and ultrasonic transducers for detection and identification of people and animals. Various algorithms will be developed for them, which are computationally less intensive and amenable to implement on sensor network. We identify the physics-basedphenomenology associated with the targets and the features selected for classification are based on the phenomenology. We fuse the results from various sensor modalities to achieve higher probability of correct classification.

4. [1] MrigankaGogoi [2] Savio Raj Philip. Traditional methods of detecting animals in paddy fields and farms include the use of human eyes to witness animal movements. It is not possible for human beings to monitor animal movements continuously throughout the day. So there is a need for specialized detection of animals particularly which enter the paddy fields and farm land of human beings. The methods used for the recognition of the animals include segmentation and object detection process. In the segmentation process frame differencing is used which is followed by thresholding. In the process of frame differencing two consecutive frames are subtracted which will leave only the moving objects. The process of segmentation is followed by object detection. There is a state of art overview to go through the work done by people in this field. After studying several object detection methods, finally the scale invariant Fourier transform method is selected owing to several advantages as compared to its counterparts.

5. [1] S. J. Sugumar [2] R. Jayaparvathy Man–animal conflict has been on the rise in the forest border areas with herds of wild pachyderms straying into human habitation. The surveillance and tracking of elephant herds are difficult due to their size and nature of movement. In this article, we present an analytical procedure to study the behaviour of elephants along forest border areas by taking migration data into consideration using a three-state Markov chain. The migration data over the whole year is divided into four different periods for the study. We also develop an intrusion detection system to detect the intrusion of herds of wild elephants from the forests into the human habitation and to send an early warning through SMS to the forest officials to take necessary action. We validate the analytical results in comparison with the data obtained from the Forest Department. We also present a multi-class classification algorithm for providing zero false alarm rate.

Species classification accuracy percentage is found to be 91.25.

III. PROPOSED METHOD

The proposed system consists of Camera, ATMega Micro-controller, PIR Sensor, Ultrasonic Sensor, LCD Display, Alarm, Flash light, Intrusion buzzer GSM kit, PC Interfacing Switch and Battery. Only if ultrasonic sensor senses a signal, the kit is not activated. If both PIR and ultrasonic both sensors senses a signal then it is found that an animal crosses the particular area, this in turn activates the relay and camera captures a snap of the animal. The PC interfaced with the camera receives the snap taken by the Camera. An alarm starts alarming when both the sensors receives the signal and a SMS is sent to the forest officer and the head of the village through GSM kit. After this the Buzzer and flash light present at the border area is activated by the forest officer or by the village head. The buzzer and flash light threatens the animal crossing the border area. So, the animal get back to forest area.

Hardware used

Hardware used in a novel approach ofintelligent security system to protect farm land from wild animals comprises of the following components:

1. ATMEGA microcontroller
2. Motion detection camera
3. PIR and ULTRASONIC sensor
4. LCD Display
5. PC Interface Switch
6. GSM Module

1. ATMEGA microcontroller

AVR is a family of microcontrollers developed by Atmel.These are modified Harvard architecture8-bit RISC single-chip microcontrollers. AVR was one of the first microcontroller families to use on-chip flash memory for program storage, as opposed to one-time programmable ROM,EPROM, or EEPRO Mused by other microcontrollers at the time .AVR microcontrollers find many applications as embedded systems; they are also used in the Arduino line of open source board designs. [2] discussed about a project, in this project an automatic meter reading system is designed using GSM Technology.

2. Motion detection camera

Motion detection is an important tool for securing your business or building. It alerts you when someone is on your property that isn't authorized. Understanding how this technology helps you set up better motion detection regions and alerts, but do you actually know how motion detection worksTo understand motion detection, you first need to understand how a camera works. Inside the camera is an image sensor, which the camera lens directs light to - when light hits the image sensor each individual pixel records how much light it's getting. That pattern of light and dark areas on the pixels becomes the complete video image you see.

Fig -3: Motion detection camera

3. PIR and ULTRASONIC sensor

In Operating principles All objects with a temperature above absolute zero emitheat energy in the form ofradiation. Usually this radiation isn't visible to thehuman eyebecause it radiates at infrared wavelengths, but it can be detected by electronic devices designed for such a purpose .The termpassivein this instance refers to the fact that PIR devices do not generate or radiate any energy for detection purposes. They work entirely by detecting the energy given off by other objects .PIR sensors don't detect or measure "heat"; instead they detect the infrared radiation emitted or reflected from an object.An Ultrasonic sensor is a device that can measure the distance to an object by using sound waves. It measures distance by sending out a sound wave at a specific frequency and listening for that sound wave to bounce back. By recording the elapsed time between the sound wave being generated and the sound wave bouncing back, it is possible to calculate the distance between the sonar sensor and the object.
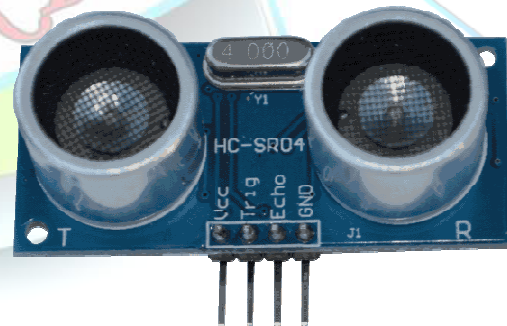
Fig -4: PIR and ULTRASONIC sensor

4. LCD Display

LCD (Liquid Crystal Display) screen is an electronic display module which find a wide range of applications. A 16x2 LCD display shown in fig 6 is very basic module and is very commonly used in

various devices and circuits. These modules are preferred over seven segments and other multi segment LED. The reasons being: LCDs are economical; easily programmable and have no limitation of displaying special & even custom characters. A 16x2 LCD means it can display 16 characters per line and there are 2 such lines. In this LCD each character is displayed in 5x7 pixel matrix. This LCD has two registers, namely, Command and Data. The command register stores the command instructions given to the LCD. A command is an instruction given to LCD to do a predefined task like initializing it, clearing its screen, setting the cursor position, controlling display etc. The data register stores the data to be displayed on the LCD. The data is the ASCII value of the character to be displayed on the LCD. Here LCD display is used to display the name and blood group of the victim.

5. PC Interface Switch

In order to update the details of people, PC Interface Switch is used to synchronize the information from personal computer. It is used to change the mode of atmega micro-controller to converter. Through interface switch converter can be connect with USB port of personal computer.

6. GSM Module

This GSM module is a Modem that can accept any GSM network operator SIM card and act just like a mobile phone with its own unique phone number. Advantage of using this modem will be that you can use its RS232 port to communicate and develop embedded applications. Applications like SMS Control, data transfer, remote control and logging can be developed easily. The modem can either be connected to PC serial port directly or to any microcontroller through MAX232. It can be used to send and receive SMS or make/receive voice calls. It can also be used in GPRS mode to connect to internet and do many applications for data logging and control. In GPRS mode you can also connect to any remote FTP server and upload files for data logging.

IV.BLOCK DIAGRAM

The block diagram of our proposedis intelligent security system to protect farm land from wild animals shown in the fig-6
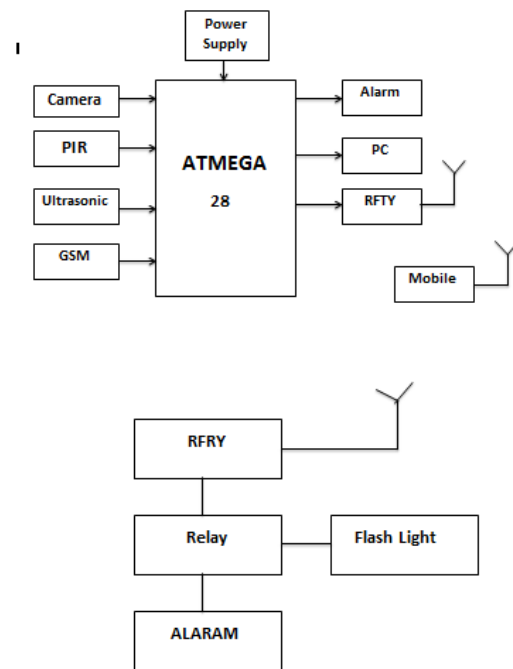

Fig-6 Block Diagram of the Proposed System

VI. CONCLUSION

Our intelligent security system to protect crops from wild animals. It is economical and it can be easily handled by everyone. In future, the proposed system can be nationalized. It can be implemented in farm area which are nearer to forest area. In addition, image processing technology can also be included to improve the accuracy of the obtained results.

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BIOGRAPHIES

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