# SHIELD THE FIELDUSING IOT FROM FAUNA

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*Abstract* — The main aim of our project is to protect the crops from damage caused by animal as well as to divert the animal without any harm. Animal detection system is designed to detect the presence of animal and offer a warning. In this project we used image and ultrasonic sensors to detect the movement of the animal and send signal to the controller, it diverts the animal by producing sound and fire illusions, signal further, this signal is transmitted to GSM and which gives an alert to farmers and forest department immediately.

#### I. INTRODUCTION

The effects on deforestation and human intervention causing animals migration towards the agriculture field especially in the area which comes in forest territory. The animals are crossing the boarders and destroying the cash crops such as Rice, Pulses, wheat and vegetables etc. The issue is raising agricultural disinterest amongst small and marginal farmers and directly impacting their livelihoods. To sustain interest of small and marginal farmers in hilly areas, require technological intervention for protection of their agriculture crops from wild animals. Due to over population, it occurs a deforestation this results in shortage of food, water and shelter in forest areas. So, Animals interference in residential areas is increasing day by day which affects human life and property causes human animal conflict but as per nature's rule every living creature on this earth has important role in eco- system. Agriculture is the backbone of the economy but because of animal interference in agricultural lands, there will be huge loss of crops.

Elephants and other animals coming in to contact with humans, impact negatively in various means such as by depredation of crops, damaging grain stores, water supplies, houses and other assets, injuring and death of humans.

Farmers in India face serious threats from pests, natural calamities &damage by animals resulting in lower yields Traditional methods followed by farmers are not that effective and it is not feasible to hire guards to keep an eye on crops and prevent wild animals. Since safety of both human and animal is equally vital. So, animal detection system is necessaryin farm areas.

To protect the crops from damage caused by animal as well as divert the animal without any harm. Animal detection system is designed to detect the presence of animal and offer a warning. In this project we used PIR and ultrasonic sensors to detect the movement of the animal and send signal to the controller. It diverts the animal by producing sound and signal further, this signal is transmitted to GSM and which gives an alert to farmers and forest department immediately.

- based on physiological measures correlated with animals;
- using physical variables such as activity and movement;

 behavioral indices including performance or activity directly related to the drivingtask, for example, animal entry zone; To sustain interest of small and marginal farmers in hilly areas, require technological intervention for protection of their agriculture crops from wild animals.

- ✓ model-based, including the use of prior database;
- $\checkmark$  combination of the above methods.

### **II. SYSTEM SPECIFICATION AND WORKING**

In our proposed work, when the animal enter into the farm area. The PIR and ultrasonic sensor detect the presence of the animal and send an input signal to the controller. Immediately, the APR board will be on, and the sound is played to divert the animal. During night time the flash light will be on and the message will be send to the forest department and a call to the farmer.

Power supply will be given by the solar panel or from regulated power supply. The LCD display the presence of animal and LDR readings. The GSM module is used for sending SMS and make call.



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Fig. Outline diagram of proposed system

we have designed a system in which sound is played and by using LDR it detects light intensity, if it is less, it will focus the light. So that wild animals will not enter intothe farm. It will run away. GSM module sends message to the farmer to alert him. From this it is concluded that the design system is very useful and affordable to the farmer. The design system will not be dangerous to animal and human being, and it protects farm.

#### **III. UNIQUENESS IN OUR SOLUTION**

- To develop an animal image processing using (CNN) in agriculture field for desired accuracy.
- Using different modules in same processor which affects animal psychologically.
- Using new technologies like neural network / artificial intelligence to improve habitat of animals and conservation.
- Preventing cash crop and protecting wild animals from hunting and killing.
- Implementing smart agriculture using smart sensors which generates interest amongsmall and marginal farmers.

### 1. HARDWARE

For designing this hardware many types of devices are used to make it perfectly working. All the devices are purchased from different manufacturers. These components are soldered on a soldering board. The following list of hardware are required for this system

- Arduino uno
- Raspberry pi 4
- Ultrasonic sensor
- Image processing sensor

### **Raspberry pi Memory**

The raspberry pi model Aboard is designed with 256MB of SDRAM and model B is designed with 51MB.Raspberry pi is a small size PC compare with other PCs. The normal PCs RAM memory is available in gigabytes. But in raspberry pi board, the RAM memory isavailable more than 256MB or 512MB

#### **CPU (Central Processing Unit)**

The Central processing unit is the brain of the raspberry pi board and that is responsible for carrying out the instructions of the computer through logical and mathematical operations. The raspberry pi uses ARM11 series processor, which has joined the ranks of the Samsung galaxy phone.

## **GPU** (Graphics Processing Unit)

The GPU is a specialized chip in the raspberry pi board and that is designed to speedup the operation of image calculations. This board designed with a Broadcom video core IV and it supports OpenGL

### **Ethernet Port**

The Ethernet port of the raspberry pi is the main gateway for communicating with additional devices. The raspberry pi Ethernet port is used to plug your home router to access the internet.

### **GPIO Pins**

The general purpose input & output pins are used in the raspberry pi to associate with the other electronic boards. These pins can accept input & output commands based on programming raspberry pi. The raspberry pi affords digital GPIO pins.

These pins are used to connect other electronic components. For example, you can connect it to the temperaturesensor to transmit digital data.

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## IV. OBSERVATION AND RESULT

Traditional electric fence has been helpful as a guard of crops. However, that system has some problems such as it cannot notify the voltage which occasionally drops. Furthermore, the owners of the fence have to check the voltage but they cannot know it without going there .An electric fence management system we develop uses wireless communication, and it enables the owners to know the voltage and the state of the electric fence and monitor it from remote locations safely. It describes ademonstrative experiment in a mountainous region, and suggests an approach to resolve some problems. An electric fence system using wireless network technology has been developed. The system consists of several observers and a display, the farmers are able to measure voltage at the fence, and have an ability to show it. The observers transmit the voltage with the direction of the voltage leak to the display. The display shows the received data and the owners can know the state of the electric fence.







### **V.CONCLUSIO**

We implemented & tested the module in foot hills of Western Ghats in Nilgiris biosphere issue we have designed a system in which sound is played and by using LDR it detects light intensity, if it is less, it will focus the light. So that wild animals will not enter into the farm. It will run away. GSM module sends message to the farmer to alert him. From this it is concluded that the design system is very useful and affordable to the farmer. The design system will not be dangerous to animal and human being, and it protects farm.

# REFERENCE

[1]. ArturFrankiewicz; RafałCupek."Smart Passive Infrared Sensor - Hardware Platform" Year: 2013 IECON 2013 - 39th Annual Conference of the IEEE Industrial Electronics Society Pages: 7543- 7547, DOI: 10.1109/IECON.2013.6700389 CITED BY: PAPERS (1)

- [2]. Hanshi Wang; Jigli Lu; Lizhen Liu; Wei Song; Zhaoxia Wang; "Community Alarm System Design Based On MCU And GSM Year: 2015Volume:01 Pages:859-862, DOI:10.1109/ICCSNT.2015.7490876 ,IEEE Conference Publications.
- [3]. Markus Borschbach; Navya Amin ,"Quality Of Obstacle Distance Measurement Using Ultrasonic Sensor And Precision Of Two Computer Vision-Based Obstacle Detection Approaches" Year: 2015, 2015 International Conference on Smart Sensors and Systems (IC-SSS)Pages: 1-6, DOI: 10.1109/SMARTSENS.2015.7873595 IEEE Conference Publications.
- [4]. Mustapha, Baharuddin, AladinZayegh, and Rezaul K. Begg. "Ultrasonic And Infrared Sensors Performance In A Wireless Obstacle Detection System" Artificial Intelligence, Modelling and Simulation (AIMS), 2013 1st International Conference on. IEEE, 2013.
- [5]. Dr. Wilson, "Electric Fence" Handbook of Texas, Project report published by the Texas State Historical Association. August 4, 2011
- [6]. T. Mohammad, "Using Ultrasonic And Infrared Sensors For Distance Measurement" World Academy of Science, Engineering and Technology, pp. 293-298, 2009.