

# Savings of Crops from Wild Animals Solar Operated Mechatronics Embedded System

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## ABSTRACT

Most of the food requirements of people are met by Agriculture and also for the Industries raw materials. Due to intrusion of wild animals in agriculture land, crops are undergoing a heavy loss presence of wild animals are to be monitored to protect crops. 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. We propose a method to protect farms from wild animals without normal fencing. The animal detection setup is placed in safeguard the crops from the wild animals. Electricity is needed to run this setup consisting of a Torque Motor. Due to scarcity of electricity solar energy is promoted in this setup to run the Torque motor and Multiple Buzzer with High Frequency is used. It Makes sound on Receiving the signal from PIR Sensor.

**Keywords :** PIR Sensor, Torque Motor, Monitoring , Safeguard

## I. INTRODUCTION

On the planet, the economy of numerous nations is needy upon farming. Disregarding monetary advancement horticulture is the foundation of the economy. Agribusiness is the pillar of economy. It adds to the total national output. Horticulture meets nourishment necessities of the general population and produces a few crude materials for ventures. But since of creature obstruction in horticultural grounds, there will be enormous loss of yields. Harvest will be absolutely getting annihilated. There will be vast measure of loss of rancher. To stay away from these money related misfortunes it is vital to shield rural field or ranches from creature. To beat this issue, in our proposed work we will plan a framework to keep the section of creatures into the Agriculture land. 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 wild animals. To overcome this problem, in our proposed work we shall design a system to prevent the entry of animals into the farm. The main purpose of project is to develop prohibitive fencing to the farm, to avoid losses due to animals. These prohibitive fencing 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. Crops are vulnerable to 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. In this project, we propose a method to protect farms from wild animals solar operated mechatronics Embbed system, which is applied to farm along with traditional methods to improve the protection performance .Operational Arduino circuits are utilized mainly for the detection of animal intrusion from the outside of farms. The proposed monitoring scheme is to provide an early warning about possible intrusion and damage by wild animals .The solar fencing device is harmful human beings and wild animals . solar operated mechatronics Embbeded system is an effective way to reducing losses caused by animals. The objective of this project is to secure people from wild animals using solar operated mechatronics embed system. The farmer from the unknown persons and animals with help of solar energy. In the hills side, due to presents of lot of animals the farms are often destroyed by them, so the human has to protect and secure their farms. But now-a-days there is no time for the human beings to do the work. Hence to avoid the human interface (security) and also to protect the farms, we provide a system called automatic solar operated Embbeded system farm protection system.

## II. LITERATURE REVIEW

### **Bindu D and Dilip kumar M D et al Prevention of Wild Animals Entering Into the Agriculture Fields**

Bindu D and Dilip kumar M D et al describes their this paper,the conservation of crop field has been a main content and a complex issue. The animals from the protected area [PAs] are continuously attacking the crop field over the years and the protection of this crop field has become a main concern. The techniques that already being used is ineffective, in this article we are presenting a practical procedure to ward them off, by creating a system which studies the behavior of the animal, detects the animal and creates the different sound that irritates the animal and also alerts the authorized person by sending a message. We also provide a multi-class classification by

presenting zero false alarm rate and accurate species identification.

### **Krishnamurthy B, Divya M et al Solar Fencing Unit and Alarm for Animal Entry Prevention**

Krishnamurthy B, Divya M et al describes theAgriculture 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. 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. We propose a method to protect farms from wild animals Operational amplifier circuits are utilized mainly for the detection of animal intrusion from the outside of farms. The proposed monitoring scheme is to provide an early warning about possible intrusion and damage by wild animals. The Solar Electric Fence system is a modern day alternative to conventional methods of fencing to protect your crops & property. Electric Fence is an effective way to reducing losses caused by animals.

### **Kshama s.Bhise1 Wildlife Animal Tracking Using RFID and GSM Technology**

Kshama s.Bhise1 describes theproject is used to track the location of Animal in the wildlife reserves or national parks. This project utilizes a RFID (Radio Frequency Identification Device) module and a GSM (Global System Mobile) modem for this purpose. Forest officer or Government authority person will get these SMS containing area in which that animals observe.Radio frequency identification (RFID) is used to describe a system that transmits the identity (in the form of a unique serial number) of an object or person wireless, using radio waves. It's grouped under the broad category of automatic identification technologies. This paper is used to track the location of Animal in the wildlife reserves or national parks. This paper utilizes a RFID module and zig bee for this purpose. Forest officer or Government authority

person will get these SMS containing area in which that animals observe.

### Prof. Abhinav V. Deshpande Design and Implementation of an Intelligent Security System for Farm Protection from Wild Animals

Prof. Abhinav V. Deshpande describes the proposed method to protect farms from wild animals via ubiquitous wired network devices, which is applied to farm along with traditional methods to improve the protection performance. Operational amplifier circuits are utilized mainly for the detection of animal intrusion from the outside of farms. The proposed monitoring scheme is to provide an early warning about possible intrusion and damage by wild animals.

### III. METHODS AND MATERIAL

#### Equipments used:

- Arduino
- PIR Sensor
- Buzzer
- LED lights
- SD card
- Solar panel(7V)
- Rotating shaft
- Frame
- Torque Motor
- Electrical wires

#### ARDUINO

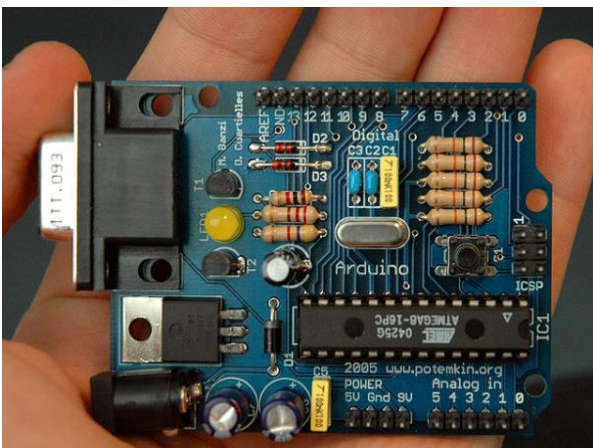


Figure 1

Arduino is an open-source electronics platform based on easy-to-use hardware and software. Arduino boards are able to read inputs - light on a sensor, a finger on a button, or a Twitter message - and turn it into an output - activating a motor, turning on an LED, publishing something online.

#### PIR SENSOR

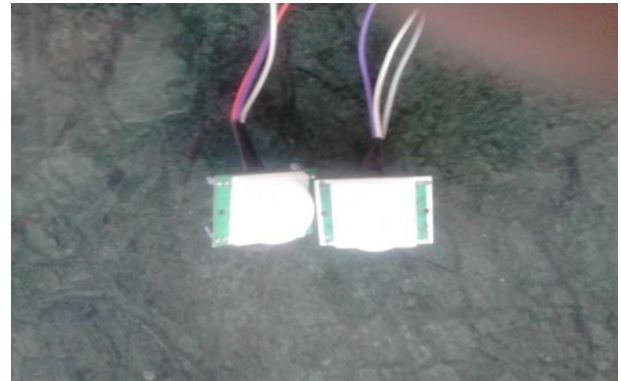


Figure 2

PIR sensor detects a human being moving around within approximately 10m from the sensor. This is an average value, as the actual detection range is between 5m and 12m. PIR are fundamentally made of a pyroelectric sensor, which can detect levels of infrared radiation.

#### LED LIGHTS



Figure 3

## WORKING

In farm areas nowadays many animals are roaming in people living areas during nighttimes and many crops are damaged by these animals(wild boar,Nilgai etc..) and also the people are giving torture to animals. This project is to protect the crops and also animal life. Initially the power to run the motor is obtained through the battery which gets energy from sun light (solar energy).Then the shaft tends to gets rotates in which PIR sensor is stationary The Passive Infrared Sensors (PIR) to detect any motion of Animals motion immediately the signal received to the Ardiuno board .After getting this signal the alarm will make a sound to indicate some intrusion in the farm Which further leads to stop the motor for 12 seconds. thus by means of the alarm or buzzer is turned ON thus the sound the animals gets scattered and harm to crops can be prevented to notify other people about the intrusion hence necessary action is employed to keep them away from destroying the crops.

## DIAGRAM



Figure 4

## DESIGN CALCULATION

### CALCULATION OF SOLAR PANEL

Solar panel specifications Maximum Power (Pmax) = 15watts

Maximum Power Voltage = 12 volts

Open Circuit Voltage (Voc) = 10.8 volts

Short Circuit Current (Isc) = 0.57amp

Temp coefficient of ISC = 0.08x10<sup>2</sup> A/C° Cells - 36

Cell Technology - Polycrystalline

Cell Shape – Rectangular

Therefore the intensity of solar panel = 15 watts

Power generation from solar energy with tracking system is given by; Since we attached solar tracking with solar panel. As we go through the study we got the conclusion that the tracking system will increase around 30-40% of power as that of normal panel without tracking.

Therefore, power generation with tracking = Pmax + 30% of Pmax = 15 + 30% of 15  
= 19.5watts

### BATTERY CALCULATION

BAH /CI = 8 ah/420ma = 19 hrs

To find the Current

Watt = 18 w Volt = 12v P= V x I

18 =12 x I I = 18/12

= 1.5 AMPS

## IV. CONCLUSION

The progress in science & technology is a non-stop process. New things and new technology are being invented. As the technology grows day by day, we can imagine about the future in which thing we may occupy every place. The problem of crop vandalization by wild animals has become a major social problem in current time.by implementing this

projects we can save the crops and Ensure the entry of wild animals to Human beings. This kind of projects can be used in crop fails for wide range .which does not Required Much power since The solar energy itself for Running successfully.

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## Cite this article as :

Sakthivel M., Kannan. G, Pradeep. G, "Savings of Crops from Wild Animals Solar Operated Mechatronics Embedded System", International Journal of Scientific Research in Science, Engineering and Technology (IJSRSET), Online ISSN : 2394-4099, Print ISSN : 2395-1990, Volume 6 Issue 2, pp. 492-496, March-April 2019. Available at doi : <https://doi.org/10.32628/IJSRSET1962111> Journal URL : <http://ijsrset.com/IJSRSET1962111>