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# Smart Fencing for Crop Field Monitoring

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***Abstract*: *We are using Raspberry pi 3B in our project, to find the birds we are using Ultrasonic Sensor, Ultrasonic Sensor placed on one servo motor it will rotate continuously to find the bird movement on the sky, after detecting any obstacle in air or sky we will start different kind of sounds for creating human presence environment.***
***Next one for animal protection, for protecting the crop from animal we formed low voltage fencing that voltage will not affect on animal life and it will generate only low voltage shock to avoid the crop destruction.***
***Last one is live video streaming using USB Camera and any time we can start or stop the fencing power from web page.***
***Keywords: Raspberry pi 3B, Ultrasonic Sensor, USB Camera***

## I. INTRODUCTION

In recent years external agents (animals) are special challenge for the farmers throughout the world. Animals like wild boars, elephant, tiger and monkeys etc cause serious damage to crops by animals running over the field and trampling over the crops. It causes the loss of crop and their money invested to grow crop. To overcome this problem we present a solution in this paper. This project is used to protect the farmland by using raspberry pi.

The objective of this project is to secure crop field from wild animals using smart electric fence deployed using Raspberry Pi. In the crop fields ,trespassing of animals leads to destruction of crops, so we need to be on our toes to protect our hard worked crops. But now-a-days humans are busier and animals have become more intelligent. Hence to decrease direct human interface and also to protect the farms, we introduce a system called smart fencing. Electric fencing is one of the efficient periphery systems to protect your property than conventional barbed wire fencing. When an animal or human being comes into contact with the electric fence they receive a sharp, short, painful but safe electric shock. The shock does not cause any physical damage. After a period of conditioning, the mere presence of the fence acts as an effective barrier even if it is not powered 'ON'. Electric fence can be made to detect a fault on the fence like shorting or cutting of the wire due to tampering on the fence with the Alarm system. If an animal charges and is entangled in the fence we can control the power supply via a web page and release the animal.

Loss of crop via external agencies mainly animals has left farmers in run for their money and in fear of losing the backbone for our economy. Many farmers have left the farming as their profession and have moved to daily wage labourers due to loss of crops. Old methods of fencing are not on to the point and are lacking in major applications sense. Covering limitations and drawbacksthe new method of smart fencing is a revelation in the field of security. This new method throws lime light on the hope for farmers across the globe. Failure of older methods of fencing and increased intelligence of animals to find new methods of entering into the crop field has led to up gradation in the thought and new fencing alternatives. From old wooden fences which were staple across the world to the implementation of wired fences to barbed wired fences even though effective have proven ineffective at times.

Advent of technology led to implementation of electric fences and barbed electric fences which have provided a good security measure until their weaknesses were exploited in the form of borrows in ground. The new method that we are proposing overcomes all the limitations either in cost of application wise and being smart by having its own brain in the form of a microprocessor in the form of Raspberry Pi. Smart as a sense we can control the electricity which is flowing in the fence, thereby helping animals from certain death if entangled in the fence.

## II. LITERATURE SURVEY

Fencing systems are required to provide protection to the particular area against thefts and animals. Serving their purpose from beginning of few b.c. The old methods were robust and were effective yet limited in their approach. Newer methods have been proving to be of greater effectiveness than the older existing methods. Well known methods of new era are Barbed wire fences, Electric Fences and Solar Fences.

In [1] 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

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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. The aim in [2] describes the 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. 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.

In [3] proposed topology,project 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.

## III. PROPOSED SYSTEM

Raspberry pi based Smart fencing system is a new and advance technology. Automation serves a vital role in the safe and reliable operation of a smart fencing. Raspberry Pi simplifies the process of automation and increases the efficiency of the system. Use of raspberry pi dramatically reduces the price of the system.

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It has 40 pins that allow us to receive and send signals. They are divided in half into two groups: the 3V, and the 5V group. Therefore, one side of the microcontroller gives a voltage of 3V, and the other 5V. Besides the 40 voltage pins, it has pins that are used to receive signals, which in our case was used to connect the button, that will send the signal for the face identification. Raspberry Pi does not have an operating system previously installed, but that can be downloaded from the Raspberry website, and transferred to an SD card.

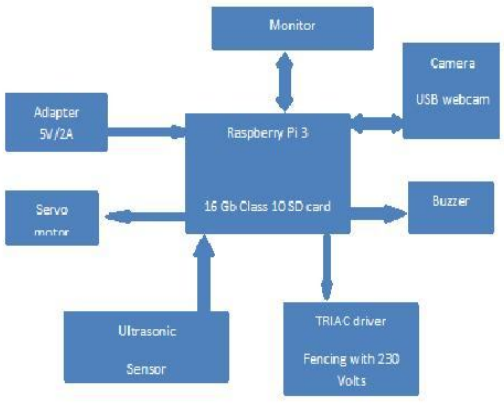



Figure 3.1: Block diagram of the proposed system

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Smart fencing system is designed to prevent the animals from eating the plants in the garden. As shown in Figure 3.2 the Ultrasonic sensor is fixed to the servo motor and the servo motor rotates continuously for fixed angles. If any obstacle occurs in ny direction, the ultrasonic sensor detects the obstacle and immediately the buzzer will be alerted.This system uses a web camera that captures the live video of the surroundings. The user can view this in the web page. Even after the buzzer indication, if the animal or any one is trying to enter into the fencing, the user will switch on the TRAIC which will provide high voltage to the fencing. When the animal touches the fencing, it will experience the shock. Then the user has to switch off the TRIAC that will disconnect the voltage to the fencing. The animal can be protected by not harming it by the high voltage.

This project is designed not only to save the garden from animals but also serves as a security to the home. The user can switch on the TRIAC in the night. This will provide the voltage to the fencing. If any intruder tries to enter into the house, the fencing is subjected to high voltage and if he tries to cross this fencing, he will experience the shock. The buzzer alert is given before the person touches the fencing. Thus, the user can check the web page immediately and turn off the TRIAC not to create any harm to the person.

## IV. CONCLUSION AND FUTURE SCOPE

Compared to the previous fencing systems, Smart fencing system gives us a wider range of accessibility and increased invulnerability to the external agents. At the same time the ability to control the voltage passing through the fence increases results in less causalities while farming to humans and farm animals. The sensor and buzzer combo act as an own brain scare crow that will ward off any birds swooping down to grab a bite on the crop.

The future holds a possibility in the development of this project. The fencing voltage can be dropped to 110 Volts and can be used so that it is more humane in approach to wild animals.

More than one Raspberry Pi can be connected to one another using Master Slave mechanism enabling us to cover a large field area and to protect it.

## REFERENCES

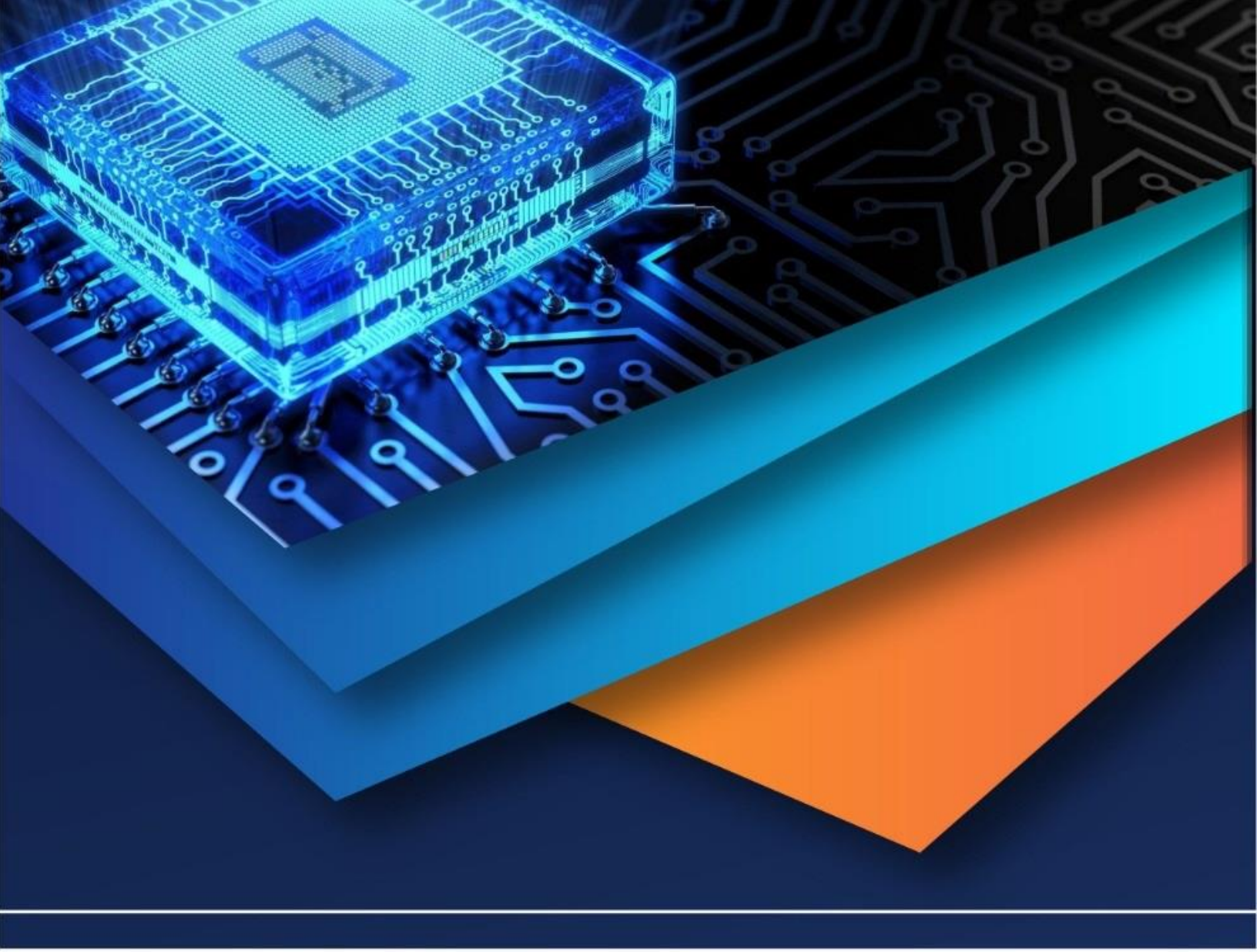
[1] Dr.Wilson " Electric Fence", Handbook of Texas, Project report published by the Texas State Historical Association. August 4,2011.
[2] T. Day and R. Mac Gibbon, "Multiple – Species Exclusion Fencing and Technology for Mainland Sites." , Project Report published by National Wildlife Research Centre, 2007.
[3] A. Stoler, "Taut Wire Fence System," U.S. Patent 4,730,809, March 1988.
[4] R. Padula and W. Head, "Fencing System" Project Report published by university of Minnesota, 2003.
[5] N.V. Bekarts, "Security Fence," A European Patent EP0014009, December 1982.
[6] K. Sharma and S. Bhise, "Wildlife Animal Tracking Using RFID and GSM technology".
[7] Abhinav V. Deshpande, "Design and Implementation of an intelligent Security System for Farm Protection from Wild Animals".
[8] S. Santhiya, Y. Dhamodharan, N.E. Kavi Priya, C.S. Santhosh, M. Surekha, "A Smart Farmland Using Raspberry Pi Crop Prevention And Animal Intrusion Detection System."
[9] M. Prabhavathi, A. Kiranmai , " Smart Security for Agriculture Using IOT".
[10] Krishnamurthy B, Divya M, Abhishek S,Shashank H A,Solar Fencing Unit and Alarm for Animal Entry Prevention'', May 2017.

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