Human Safety in Farm from Wild Animals

Arpita Roy[1], Vaishnavi Jadhav[2], Manali Jiwane[3], Shaily Kamble[4], Prof.Namrata D. Ghuse[5]
[1,2,3,4,5] *Computer Engineering SITRC, Nashik, India*

***Abstract*- Interference of wildlife into habitat without prior knowledge is known to be destructive for both human beings and animals. Human interactions with wildlife are defining experience of human existence. These interactions can be positive or negative. The main aim of the proposed system is to detect wild animals. This system uses long range IR sensors and ESP8266 Wi-Fi module to detect the movement of the animal and send signal to the controller. This signal is transmitted to GSM, which is an alert to farmers and forest department immediately. This system also uses RFID (Radio Frequency and Identification) so if the animal is near to the sensors the id will be known. The proposed system endeavrous to prevent casualties that occur in areas having high human wild animals interaction.**

***Index terms*- IOT (Internet of Things), Sensors, GSM (Global System for Mobile Communication), Buzzer**

I.INTRODUCTION

Farm raiding by wild herbivores close to an area of protected wildlife is a serious problem that can potentially undetermined conservation efforts. Technology plays a central role in our everyday life. There has been a surge in the demand of Internet of Things (IoT) in many sectors, which has drawn signicant research attention from both the academic and the industry. In the agriculture sector alone, the deployment of IoT has led to smart farming, precision agriculture. This system presents the development of Internet of Things application for farmers protection to prevent animal intrusions in the farm areas. A repelling and a monitoring system is provided to prevent attack on humans in Agriculture from wild animal attacks. Animal attacks on human is one of the major threats. Animal raiding is becoming one of the most conflicts antagonizing human wildlife relationships. The current system used to counter this problem include the use of electrified welded mesh fences (usually 30cm in the ground), chemicals or organic substances and gas cannons. Other traditional methods applied by farmers include the use of Hellikites, Ballons, Shot/Gas guns, String stone, etc. These solutions are often cruel and ineffective. They also require a vast amount of installation and maintenance cost and some of the methods have environmental pollution effect on both humans and animals. On the other hand, the chemical products used to prevent these animal attacks have an application cost per hectare and their effectiveness is dependent on weather condition, as rain may cause a dilution effect. Sensor networks express a substantial improvement over traditional invasive methods of monitoring .This proposed system is based on an animal friendly IR sensor generator, which does not produce physical or biological harm to the animals nor sounds audible to humans. In this work, we present the coordination among heterogeneous sensors and actuators interacting with the cloud to provide an enabling platform for new services in this domain. In particular in the peripheral part, we adopted wireless technologies such as long range IR sensors, WiFi module etc., cooperating with the data center by an advanced IoT gateway. Another important feature that we had to consider is the lifespan of the devices before deployment. As a result, we selected low energy consuming motes equipped with batteries and solar panels for energy harvesting in order to achieve this goal.

II. OBJECTIVE

- To provide protection from the attacks of the wild animals and thus minimizing the probable loss to the farmer.
- To detect intrusion around the field.
- To capture the image of the intruder and classifying them using image processing.
- To send notification to farm owner and forest officials using IoT.

III. MOTIVATION

The safety of farmers has been a main content and a complex issue. The animals from the protected area are continuously attacking the workers 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 system 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.

IV. LITERATURE SURVEY

The various surveys on the current systems are described as follows in the literature survey

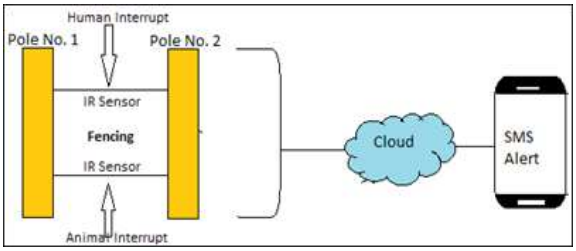
1. In March 2019, Srinidhi Kulkarni introduced 'wildlife monitoring, virtual fencing with Deforestation Notifications' so the system proposed automated solution for data prediction which helps to divert the animals while entering the village. The system uses smoke sensors, PIR sensor and motion sensor to received values and transferred through GPRS and stored in Amazon cloud. Because of this the human work can be minimized and the death of wild life also can be minimized.
2. In March 2019 Dr. P. rajkumar introduced 'wildlife intrusion and early fire detection using IOT'. In this location detection of animal along with fire detection the proposed system uses PIR sensor, IR sensor, MQ-5 Gas sensor and wifi model. Using the sensor the regular movement is checked and alert message is sent to both forest departments.
3. In January 2018,G. Naveen Balaji introduced 'Advanced crop Monitoring using internet of things based smart intrusion and prevention in Agriculture land'. This system mainly aims to secure the crop by the deployment of sensor and prevent intrusion of animals using image processing techniques. Also proposed a method for crop monitoring to increase the efficiency of the crop productivity by using the IOT technology and to avoid the damaging of crop by preventing from animal intrusion which can be monitoring by using multiple cameras in agricultural land.
4. In February 2018, M.Surekha introduced 'a smart farmland using Rasberry pi for crop prevention and animal intrusion detection system'. This system is used to protect the farmland from animals using Raspberry pi. In this system RFID is used for detecting the animal using GPS. In this method alert message not sent to forest officer it send the message to living people in the farmland by using GSM.
5. In March 2018, Dr. Menakadevi introduced Animal intrusion warning system using IOT. This proposed system seeks to detect wild animals that disturb the human life and the agricultural field with the aid of a PIC micro controller. The Proposed system is tested with animal database and if the wild animals are detected, then the messages are sent to the web page of the mobile.
6. In March 2018, Dr. Mahesh K kuluti introduced 'IOT based wireless sensor network for earlier detection and prevention of wild animals attack on farming lands'. In this system the IOT and wireless sensors networks for preventing the wild animals attack on farming lands that are nearer to the forest.
7. In 2018, K.jai Santoshi and Bhavana S. introduced 'Intruder recognition in farm through wireless sensor network', In this proposed system WSN technology is used along with the motion sensors. The system is implemented to detect intrusion of animals in farm using wireless sensors and buzzers which detect animals and produce acoustic sound.
8. In March 2018, Pradeep and Vishnu introduced IOT based automated irrigation system for agriculture. This system pro- posed a programming framework that will maintain the water necessities in the field by using automated irrigation system frameworks, so the farmers save their time and reduce the wastage of water.
9. In 2017, Nagaraju Andavarapu and Valli kumara Vatsavayi introduced Wild- Animal recognitiosn in agriculture farms using W-COHOC for agro-security. So this system proposed a new algorithm for animal recognition to achieved better accuracy on two benchmark data set compared to others existing algorithms.

10. In March 2016, DR. P. Uma Maheshwari introduced animal intrusion detection system using wireless sensor networks. This system implemented the bird intrusion by the use of wireless sensors and buzzers which produce acoustic sounds.
11. In 2015, Davide Ami Fabio Vignoli introduced IOT solutions for crop protection against wild animals attack. So this system proposed smart agriculture based on low power device and open source monitoring system for crop protection against animal attacks and weathers conditions.

V. PROPOSED SYSTEM

Description of Proposed System:

The proposed system mainly focuses on the safety of the human and also ensuring the security of the wild over human attacks on them. The system consists of sensors that are placed around the farms and the areas where farmers work. The animals crossing border is detected using long range IR sensor. Alert message is send to farmers as well as forest department. To alert people nearby farm areas through alarm buzzer sound and cloud updation. By this system if any animal intrusion is detected in any of the area in the field the farmers in that area as well as human who are near them are also getting intimation about the animal in their personal gadget so that they can help the farmer who is in the need of help.



The system uses Radio Frequency Identification for detecting the animal enter into the farmland so it has multistage uses like detection and also the animal using GPS and it is cost optimal.

Features and Characteristics of Components Used:

1) IR Sensor: An infrared sensor is an electronic device that emits in order to sense some aspects of the surroundings. When the IR receiver does not receive a signal, the potential at the inverting input goes higher than that non-inverting input of the comparator IC (LM339) output goes low, hence the LED does not glow. When the IR receiver module receives signal, the potential at the inverting input goes low. The output of the comparator (LM 339) goes high and the LED starts glowing.

Fig. 1. IR Sensor

2) ESP 8266: ESP8266EX can be applied to any micro- controller design as a Wi-Fi adaptor through SPI/SDIO or UART interfaces. Low-cost Wi-Fi connecting microchip with full TCP/IP stack controller capability. The ESP8266 Wi-Fi Module is a self-contained SOC with integrated TCP/IP protocol stack that can give any microcontroller access to your Wi-Fi network. The ESP8266 is capable of either hosting an application or offloading all Wi-Fi networking functions from another application processor.

Fig. 2. ESP 8266

3) RFID: Radio-frequency identification (RFID) uses electromagnetic fields to automatically identify and track tags attached to objects. The tags contain electronically stored information. Passive tags collect energy from a nearby RFID reader's interrogating radio waves.

Feature of RFID:

- Multiple Read.
- Read Through Material.
- Broader Range(Distance)
- Reduced Human Intervention.
- Higher Throughput.
- Inventory Accuracy.
- Real Time Information.
- Increased Security and Traceability.

Fig.3. RFID

4) Buzzer: A buzzer is automatic electromagnetic, electroacoustic, magnetic, electromechanical or piezoelectric auditory gesture device.

5) GSM: GSM stands for Global System for Mobile Communication. It is a digital cellular technology used for transmitting mobile voice and data services.

Fig. 4. GSM

GSM is a circuit-switched system that divides each 200 kHz channel into eight 25 kHz time-slots. GSM operates on the mobile communication bands 900 MHz and 1800 MHz in most parts of the world. In the US, GSM operates in the bands 850 MHz and 1900 MHz.

GSM Specification:

- Transmission rate.
- Speech coding.
- Channel spacing.
- Frequency Band.
- Modulation.

VI. ADVANTAGES, FEATURES AND APPLICATION OF PROPOSED SYSTEM

A. Advantages

- Works on batteries.
- Continuous monitoring can be done.

B. Features

- Simple and one time installation. 2) Highly reliable.
- Cost effective.
- Easy to use and operate. 5) Long lasting.

C. Applications

- Used to protect farmers from attacks of wild animals. 2) To be used in various security systems.

VII. CONCLUSION

The problem of workers safety from wild animals has become a major social problem in the current time. It requires urgent attention and an effective solution. Thus this project carries a great social relevance as it aims to address this problem. The proposed system based on IR sensor is found to be more compact, user friendly and less complex, which can readily be used in order to perform. Several tedious and repetitive tasks. In this project the process is fully automated and it does not cause any hurt to animal during repellent. Future scope in this project is to detect the location of the animals by using RFID injector and GPS.

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