

WARNING SYSTEM FROM THREAT OF WILD ANIMALS AND ECO BALANCE USING IOT

Mrs Arthi L¹, Ms. Manushree L²
Assistant Professor¹, Developer, Zoho Corp.²
Department of Information Technology
Sri Sai Ram Engineering College
Chennai, India

Balaji B, Student
Department of Information Technology
Sri Sai Ram Engineering College
Chennai, India

SaranKumaar K, Student
Department of Information Technology
Sri Sai Ram Engineering College
Chennai, India

Hariharan S, Student
Department of Information Technology
Sri Sai Ram Engineering College
Chennai, India

Abstract:

Wildlife entering in to populated areas has recently become very Popular. The area for the wild has decreased as humans are encroaching their area. It creates great loss to property and life when wild animals enter in to cities. We use latest advances in technology such as Internet of Things (IoT) to create an alert system of possible wildlife leaving the forest and also the message will send to the users Mobile to alert them. We use low cost motion detectors and Passive Infrared sensors to achieve this. We relay information of such motion to a control centre to take further actions. We also include making loud noise through speakers in which the animals cannot enter in to land. The basic idea of IoT is to connect different sensors and establish communication and also provide services. In this article, several IoT devices are used at the periphery of natural reserve to create an alert system. This system can also be used to find out smugglers and other people illegally entering in to the forest.

Keywords: IoT, Passive Infrared Sensors

1. INTRODUCTION AND OVERVIEW:

Because of increase in human population the forest lands are getting converted in to human settlements. Due to this, the wild animals face an acute shortage of water and food. Further, wildlife is greatly affected due to deforestation It creates great loss to property and life when wild animals enter cities. This is a cheaper system which provides good to both wild animals

Many humans are getting attacked by animals therefore, there is a need for an intelligent surveillance and alert system. Here Raspberry Pi 2 is used in this project as it is a single board computer and low cost. The system used here has a large huge user base and operates on open source software

2.OBJECTIVES:

The main objective of our proposed system is to prevent the wild animals from the accidents and to notify the peoples located near forest areas. This system will put the Passive Infrared Sensors in the borders of the location area of the people, alert alarm system will put in the common place in which all peoples can hear, sensors which detect the motion of the animals will send the data/information to the operational centre and the alert system will activated by them in the centre and also the message will send to the mobile users. Compared to the existing system by passing high voltage electricity in the fences across the forest edge. This proposed system will provide good to both wild animals and the peoples.

3.COMPONENTS:

3.1.Passive Infrared Sensors:

This sensor detect the humans and animals depending upon their motion. This sensors will use the process of detecting the humans and animals in the form of heat by Infrared red radiation .When any objects like animals, humans pass in front of the sensor because of change in temperate the sensor will sense the data and process according to the way of program. This will also detects the objects that varying of temperature.

3.2.Raspberry pi 3:

This is a 40 pin configured system such that various devices can connect to it such as Sensors, GPS devices etc..

4.ARCHITECTURE DIAGRAM:

The proposed system includes the Raspberry pi3 module, Sensors, Operational Centre, speakers and solar Panels for Providing power to the sensor tower.

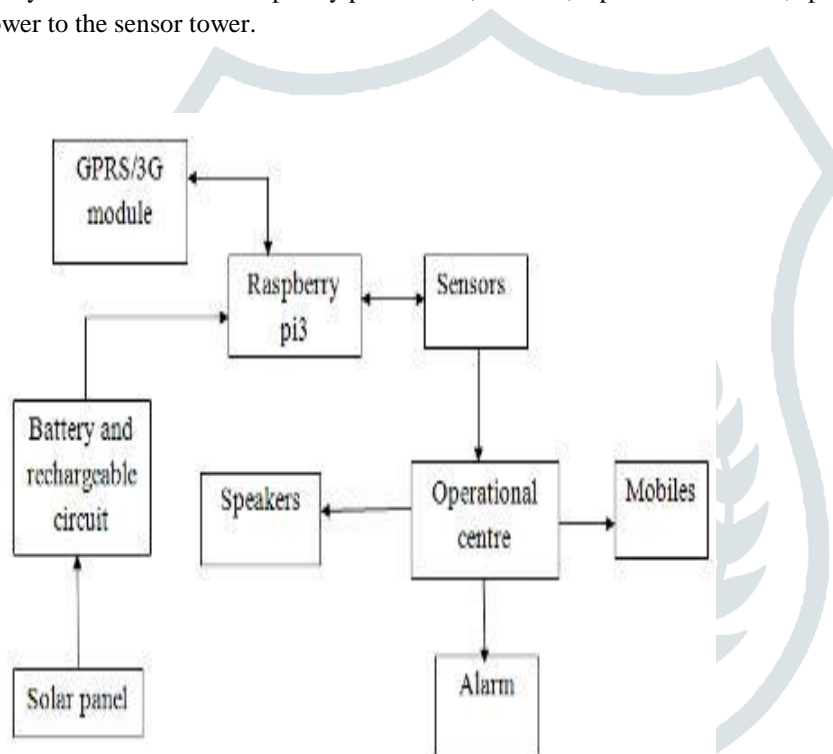


Fig:1 Architecture diagram for a proposed system

5. Working:

Sensor tower will be kept at a boundary of the forest regions. The system proposed here is a sensor network system to create an alert system. The sensor tower is present at the boundary of the forest to track movement of wildlife and humans near the boundary. The sensor tower is made up of Raspberry Pi 3 (RPi 3) and other components. RPi 3 as it is a single board computer

with Linux operating system. RPi 3 has 40 GPIO pins which can be used to control and get information from the sensors. We use PIR sensors for motion detection. Instead of IR camera alternative can be to use but for simplicity we use PIR sensors. The sensor tower also has GPRS/3G module to connect to the Operational centre. The boundaries of the forest have GPRS connectivity as they are closer to the human population. This makes communication easier. If a motion is detected by the PIR sensor, the data will send to the Operational centre. Then the Operational centre will activate the speakers and the message will send to the concerned officials and the peoples who are located in the forest areas.

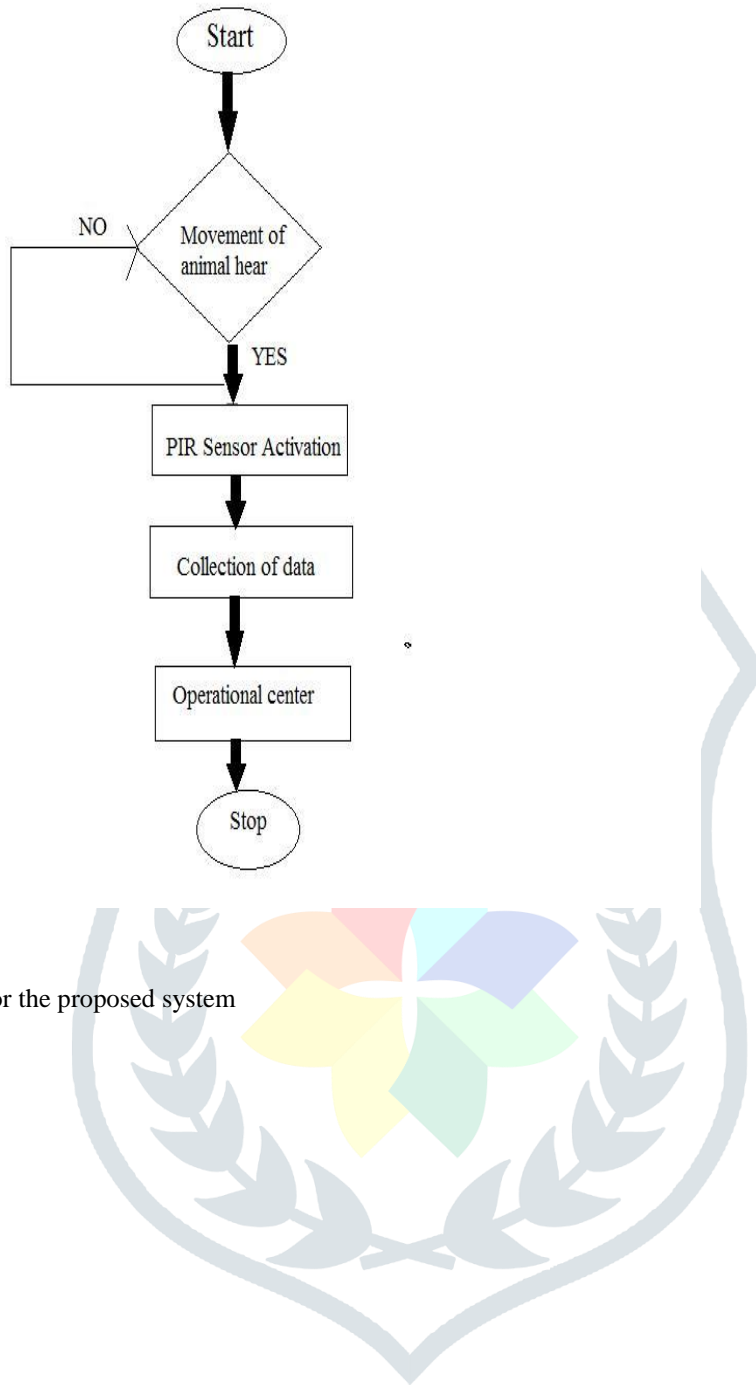


Fig: 2- Flow chart for the proposed system

6. ANALYSIS OF EXISTING SYSTEM:

- The Existing System provides alarm system that is operated only by the officers after entering of animals in to the land.
- This system put the electric cables or Trap near the boundary areas such that when the animal or humans that gets in to the cables it will get affected.
- Also in some areas there is no such alarms or cables.



Fig:3-Animals Entering in to the land and attacking humans

7.LITERATURE SURVEY:

Usage of sensor networks in monitoring the activities, tracking and detection of different wildlife species is a common practice that is carried on. For tiny insects, rodents, animals and birds, RF tags are used to track their movement using radio telemetry. This is a expensive solution and these RF tags have to be replaced then and there after their life span like expiry time period. To overcome the limitations such as cost and hurting animals lead to a new technology is needed that enables new ways to monitor wildlife. A team of expert researchers are continuously working on the different aspects of such a recent modern technology. They have also worked and reported on their research on a sensor- network-based tracking solution for bats which can be tracked over a time period. A preliminary research on the real-world bird tracking system, and discussion of system's working process and also its mechanisms such as power saving techniques, data storage, and communication indication, data transfer is done and mainly it is low cost which is beneficial to overcome limitation of previous approach, tracking of wildlife using radio collars was implemented. This approach also reduced implementation cost. Radio collar is put around animal's neck which generates a very high frequency. In this approach researchers have to physically go into the field and try to track using directional antenna which is time consuming approach. To make an improvement on this approach an aircraft drone with radio on-board is used which receives the signal and collar position of animal which is tracked. A wireless sensor network system and many more sensory networks are developed to monitor the migration patterns of Swamp Deer, known as Wild CENSE. In this approach climatic and positional information of animal was collected and sent to base station using peer to peer network. Radio transceivers are used to transmit data to base station. A peer node in it has a external data flash memory which record the collected data in each node. The data collected from the flash memory is processed and information would be sent to database server via internet.

8.ADVANTAGES:

- This proposed system is used to detect the animals by without affecting them.
- Deaths caused by the animals to humans can be minimized.
- Because of the sounds produced by the speakers near the sensor tower, Some animals will not enter in to the areas.
- Hunting of animals can also be minimized.
- Wild animals can be protected

9.CONCLUSION:

The proposed solution for wildlife alert system is much cost-effective, reliable and provides technically simple solution. This approach believes that using various such IOT devices, an environmental balance can be achieved by protecting the wild animals from getting harmed. The proposed method is also simple method to implement and environmental friendly as well. It can save human life and property. We have various scope for improvement in our model such as capturing the image of the animals that is sensed by the sensors, better motion detection using image processing with night vision cameras. Many new advanced approaches can also be proposed to completely avoid the wild animals from leaving forest boundaries using safer methods than electrical fence

10.REFERENCES:

- [1] Xiaohan Liu, Tao Yang, Baoping Yan“Research on the Architecture of Wildlife Observation and Communication System” Computer Network Information Center (CNIC) Chinese Academy of Sciences Beijing, China IEEE 2015.
- [2] William P. Bennett, Jr., Mehmet C. Vuran , Matthew B. Dwyer , Sebastian Elbaum , Anne Lacy , Mike Engels, Walter Wehtje “Sensing Through the Continent: Towards Monitoring Migratory Birds Using Cellular Sensor Networks” Department of Computer Science and Engineering University of Nebraska - Lincoln, Lincoln, NE.IEEE April 2012.
- [3] Vishwas Raj Jain, Ravi Bagree, Aman Kumar, PrabhatRanjan “wildCENSE: GPS based Animal Tracking System” DhirubhaiAmbani Institute of Information and Communication Technology Information and Communication Technology Gandhinagar, India.IEEE2008.Pg-no 617-622.
- [4] Gilberto Antonio Marcon dos Santos1Alex Ke, Han Lin, Curt Schurgers, Albert Lin and Ryan Kastner , Zachary Barnes “Small Unmanned Aerial Vehicle System for Wildlife Radio Collar Tracking” University of California, San Diego , Eric Lo, Bryan Ritoper, Lauren Nishizaki, Xavier Tejeda2. 2014 IEEE 11th International Conference on Mobile Ad Hoc and Sensor Systems. Pg no 761-766
- [5] Falko Dressler, Simon Ripperger, Martin Hierold, Thorsten Nowak, Christopher Eibel, BjörnCassens, Frieder Mayer, Klaus Meyer-Wegener, andAlexander Kölpin” From Radio Telemetry to Ultra-Low-Power Sensor Networks: Tracking Bats in the Wild IEEE communication magazine, January 2016 .pg.-no 127-135. [6] Monitoring migratory birds using cellular sensor network: Information Processing in Sensor Network (IPSN), 2012 ACM/IEEE.
- [7] Tolerant sensors network for wildlife tracking and monitoring: Global Telecommunications Conference, 2011 IEEE.
- [8] Autonomous airborne wildlife tracking using radio signal strength: Intelligent robots and systems, 2010 IEEE/RSJ.
- [9] Wireless communication and Sensor network (WCSN): 2008 IEEE.