IoT-Enabled Smart Elephant Detection System for Combating Human Elephant Conflict

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ABSTRACT

Intrusion of wildlife is proved to be destructive for both human beings and animals. The incompatibility between the human wildlife is the major cause that leads to crop damage, injuries caused to both human and animals. In this system we have put forth wildlife intrusion monitoring using IOT. The wildlife are identified by using voice. Based on the voice we can easily identified wildlife, here we are going to identify the Elephants. And SMS notification along with the alarm is processed to the forest officials indicating that an animal has been detected in the forest borders and is fast approaching the human habitats. The existing system also focuses on atmospheric monitoring and therefore it overcomes the drawbacks of existing system. Thus, we have refined a prototype model that allows persistent detection and monitoring.

Keywords— *Border Detection ,prevention .*

1. INTRODUCTION

The rapid increase in human population has led to the conversion of forest land into human settlements. Due to this, the wild animals face lack of food and water. However, wildlife is greatly distressed due to deforestation which forces them to move into human habitats. It creates tremendous loss to properties and lives. In Times of India it has been reported that over 1300 people died due to tiger elephant attacks in India over the past three years. Thus, humans face serious danger and the time to regain from the huge loss is imperceptible. Human animal interaction can prove to cause crisis for both species and therefore there is a need for an intelligence supervision and perceptive system. Human animal conflict is increased to a higher extent. A number of factors include elephant habitat structure, weather, animal life etc. Forest fire is an important hazard that occurs periodically due to the natural changes, human activities and other factors. In the contemporary years there is a persistent increase in the forest fires that causes damage to crops, wildlife as well as to humans. Therefore, a network based wireless sensor is used for forest fire to achieve high verdict accuracy for the early detection. The approach targets on detecting animals and sending cautionary messages using GSM and alarm. The humidity of the forest is measured and maintained. The main aim of our work is to alert the people in and around the forest borders and to forbid their lives. In an uncontrolled field environments like desert, forest or trees it is desirable to develop computer perception tools instead of performing physical field investigation. These, automated tools helps in many adequate and predictable studies.

2.LITERATURESURVEY

LITERATURE SURVEY 1

CONCEPT USED

The findings of our work contribute to conservation of elephant issues and solutions to human elephant conflict. We recommend the usage of real time system to identify individual animals or group of animals approaching the human habitats. This study provides insights to safeguard the animals from human activities and reduces the work pressure for the forest officials. Our model overcomes the drawbacks of the existing system. Location detection and humidity detection along with animal detection is done. Our system can be deployed at forest borders, tea estates, food plantation, water holes, migration routes etc. for elephant monitoring and detection. Human-animal collision can be reduced to a greater extent. This system also focuses on conservation of rare species. Humidity can also to monitored and notified. Traditional observation can be less effective. Therefore, automated systems are being used. The real time automated approach minimizes manual work and is more efficient and reliable when compared to all existing systems. Thus, not only monitoring and detecting, prediction of future is also possible in Internet of Things (IOT).

LITERATURE SURVEY 2

CONCEPT USED

A system by using the wireless sensor networks to detect the intrusion of birds and animals in the agricultural lands is discussed. The animal faces are detected by area unit measurement by utilizing face notification technique with totally different native distinction configuration of effulgence channel to detect the image region of animal faces. The infrared sensor is used detect the entering of the animals. This paper has the lighting drawback, in which a sudden amendment of lighting impact largely in indoor application will have an effect in the presence of animal intrusion. The brightness level drawback with changes of natural surroundings from day to night time at outside closed-circuit television may effect on the detection. The moving leaves by wind may be considered foreground image and a few inactive animals that stay static time as background image by the algorithms. For crop monitoring, a method of intelligent agricultural crop monitoring system based on Zig Bee technology is discussed here. The system involves the processing of data acquisition, processing, and transmission and reception functions. The main purpose is to maintain the system efficiency in the monitoring area. IOT technology is used in this monitoring system with the B-S structure and cc2530 as like a chip processing for wireless sensor node. But this paper does not have the technique of predicting crop water requirement. This system explains the use of pyro electric infrared sensors. It produces an electric potential by means of a very small change in temperature. PIR sensors are quite fit for detecting moving targets. Many security systems have made PIR sensors to be a good alarm for intrusion and precise counter for targets which are not only for people but also for vehicles and so on. PIR sensors are not deployed in an indoor environment where the detecting range is confined in several meters. They are used to detect target more than 20 meters away in unattended wild ground environment. This explains a system to monitor a specific wild district using PIR sensors. In this paper recognition of more kinds of targets is not implemented and the accuracy of classifying is sometimes disturbed by the use of sensors. This drawback can be overcome by using certain algorithms instead of time domain and frequency domain. This system explains the use of Python scripts for integrating the Internet of things, Raspberry pi, and wireless sensor networks to accentuate the methods for identification of rodents, threats to crops and delivering real time notification based on information analysis and processing without human intervention. The lack of information transmission and data analyzing has been solved by integration of internet of things with currently available security devices in order to achieve efficient food preservation and productivity. This paper does not have the technique of pattern recognition for machine learning and to identify objects and categorize them into humans, rodents and animals, also sensor fusion can be done to increase the functionality of the device. This drawback can be overcome by the grid of panels consisting PIR sensors and URD sensors.

LITERATURE SURVEY 3

CONCEPT USED

The goal of this project is to track the location of Animal in the zoo or national parks. This system would include a temperature sensor and PIR sensor. The temperature sensor senses the temperature of each animal and PIR sensor senses the human presence inside the animal boundaries or restricted areas. Generally every animal having particular range of body temperature. If the animal having any wounds or fever, the body temperature will be automatically increased. To monitor this, we are using temperature sensor. It continuously monitors the animal's temperature. If any variation in the temperature, It will be displayed on the LCD. The PIR sensor is used to monitor the human presence in restricted areas or nearby the animal boundaries. When the human presence is detected, the voice processor will give alert to the people through the pre-recorded voice. The GPS receiver send the location, animal temperature to the controller and it is interfaced with the IOT, It will give the complete information to the website on PC or laptop.

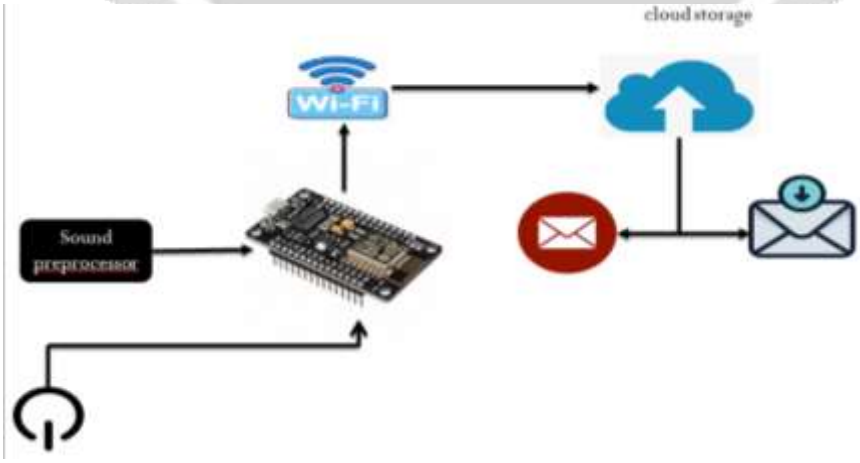
1. **EXISTINGSYSTEM**

Talking about existing technologies in some countries, many animals have belt in their neck. This belt has a wireless transmitter. A wildlife officer have receiver in his/her hand and will search location. However main drawback of this technique is that range of wireless transmitter is less. In some sensors it is 100 meters in some sensor it is in few kilometers but not more than that. But as we know that forests and wildlife national parks are hundreds of kilometers in length. And in such situations these wireless transmitters are not much useful and they are time consuming. With the help of GPS technology and GSM technology, we can track an animal in the forest of thousands of kilometers in length.

2. **PROPOSEDSYSTEM**

In this system, we are recognizing the problems of detecting animals in forest border areas using IOT. The main objective of the system is to alert and protect the people across the forest borders. Once the animal is detected across a particular range, it is sensed and a notification is sent and an alarm is produced which indicates that the animal is approaching the human life. In this system we are using Nodemcu is the main controller, and also we used sound sensor for recognize the sounds and audio analyzer. In this we can calculates the different animals of voice pitch rate. Here we are going monitor the Elephants. If the Elephant identified then alert messages are given to the authorized persons by using the Ubidots..

3.BLOCK DIAGRAM



4.ARCHITECTURE

The system will likely be an example of event-driven architecture, bottom-up made (based on the context of processes and operations, in real-time) and will consider any subsidiary level. Therefore, model driven and functional approaches will coexist with new ones able to treat exceptions and unusual evolution of processes (multi-agent systems, B-ADSc, etc.). In an Internet of things, the meaning of an event will not necessarily be based on a deterministic or syntactic model but would instead be based on the context of the event itself: this will also be a semantic web. Consequently, it will not necessarily need common standards that would not be able to address every context or use: some actors (services, components, avatars) will accordingly be self-referenced and, if ever needed, adaptive to existing common standards (predicting everything would be no more than defining a "global finality" for everything that is just not possible with any of the current top-down approaches and standardizations). Building on top of the Internet of things, the web of things is an architecture for the application layer of the Internet of things looking at the convergence of data from IoT devices into Web applications to create innovative use-cases. In order to program and control the flow of information in the Internet of things, a predicted architectural direction is being called BPM Everywhere which is a blending of traditional process management with process mining and special capabilities to automate the control of large numbers of coordinated devices.

5.Network architecture

The Internet of things requires huge scalability in the network space to handle the surge of devices. IETF 6LoWPAN would be used to connect devices to IP networks. With billions of devices being added to the Internet space, IPv6 will play a major role in handling the network layer scalability. IETF's Constrained Application Protocol, ZeroMQ, and MQTT would provide lightweight data transport. "MQ" in "MQTT" came from IBM's MQ Series message queuing product line. Fog computing is a viable alternative to prevent such large burst of data flow through Internet. The edge devices' computation power can be used to analyse and process data, thus providing easy real time scalability.

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