ANTI POACHING OF TREES AND WILDLIFE MONITORING

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Abstract: Depleting natural habitats for animals and thereby creating an imbalance in the nature is very much visible in the current scenario and one of the prime reasons is due to smuggling of trees in forested areas. This not only leads to increased risk of the priceless natural resource towards being extinguished, but also affects the lively hood of people in these habitats. This project proposes a solution to the same through a micro-controller this system employees a WSN protocol which is empowered to monitor vibrations of the trees through a MEMS accelerometer/flex sensor. A low power msp430f5528 microcontroller is used along with 2.4 GHz zigbee to communicate to the Central Base/Monitoring Station from a geographical location where activity is detected. WSN is used by the monitoring application, alongside reduces the limitation of transmitting capacity of a communication module and optimizes battery consumption. The embedded system architecture and the hardware/software designs are described in detail.

Index Terms – **Embedded system, WSN (wireless network), ZigBee**.

I. INTRODUCTION

Forests are a part of the absolutely necessary resource for human survival and social development that protects the balance of the earth ecology. Because of some uncontrolled human activities and abnormal natural condition, forest fires occur frequently. These fires are most serious disasters of forest resources and the human environment. In recent years, the frequency of forest fires increased due to climate changes, human activities under other factors. The prevention and monitoring of forest fires has become a global issue in forest fire prevention organisations. Currently, forest fire prevention methods largely consist of patrols, absolution from watch towers, satellite monitoring and lately wireless sensor networks. Although absolution from watch towers is easy it has several defects, as it requires financial resources and material resources and it also needs well trained labour force. Forest fires are mainly due to carelessness, absence of the post, inability for the real time monitoring and the limited area coverage.

It is uncommon if one hasn't heard or read about trees being smuggled (Sandal Trees, Sagwan Trees, etc), especially the ones which are expensive in the commercial market across the world. There are varied consumptions of these trees and to name a few, use in cosmetics, medicines, luxury furniture, etc. There is a huge quantum of loss incurred when these trees are smuggled as there has been a huge investment to grow them and mostly they are grown in wooded regions i.e. forest areas. We need to restrict / control these smuggling activities through some preventive methods and on the same lines, we are proposing the solution in this project.

Researchers regarding animal detection have been an important field to number of applications many rules that should be followed by calculations and methods have been developed by human being in order to have a better understanding on animal behaviour. Also, these applications can act as a warning to humans from intrusion of dangerous wild animal for early precaution measures these applications can be brought down to three main branches, namely detection, tracking and identification of animal.

wireless communication – based Smoke detection System design for forest fire monitoring.

Based on wireless communication technology , this paper designs a Smoke detection system for fire monitoring first this paper designs the hardware scheme for key functional modules and implement the integration of the entire system as well as functional debugging at the Platform, based on hardware design the overall scheme of software is setup, which successfully gets through the experimental debugging. For communication, the data received from sensor nodes is collected by a router to a coordinator, and subsequently sent to the GPRS module through a serial port. Finally the information shown on the PC the overall system satisfies the particular forest environment monitoring.

II. LITERATURE AND SURVEY

[1] Early forest fire alarm systems are critical in making prompt response in the event of unexpected hazards. Cost-effective cameras, improvements in memory, and enhanced computation power have all enabled the design and real-time application of fire detecting algorithms using light and small-size embedded surveillance systems. This is vital in situations where the performance of traditional forest fire monitoring and detection techniques are unsatisfactory

[2] This paper presents a forest fire monitoring and detection method with visual sensors onboard unmanned aerial vehicle (UAV). Both color and motion features of fire are adopted for the design of the studied forest fire detection strategies. This is for the purpose of improving fire detection performance, while reducing false alarm rates. Indoor experiments are conducted to demonstrate the effectiveness of the studied forest fire detection methodologies.

[3] Based on wireless communication technology, this paper designs a smoke detection system out of the need for forest fire monitoring. Firstly, this paper designs the hardware scheme for the key functional modules, and implements the integration of the entire system, as well as the functional debugging at the platform. Based on the hardware design, the overall scheme of software system is set up, which successfully gets through the experimental debugging. For communication, the data received from the sensor nodes is collected by a router to a coordinator, and subsequently sent to the GPRS module through a serial port. Finally, the information is shown on the PC through the Internet.

[4] The overall system satisfies the particular need of forest environment monitoring, and presents a good prospect of application and promotion.A fault-tolerant cooperative control (FTCC) strategy for cooperative unmanned aerial vehicles (UAVs) used in forest monitoring, fire detection and tracking is investigated in this paper. The proposed algorithm solves the problem of monitoring and detection of forest fires, even when fault occurs to one or more UAVs. During the search stage, the UAVs team moves in a certain formation shape, a distributed sliding mode formation control is designed to keep the desired formation shape during this stage.

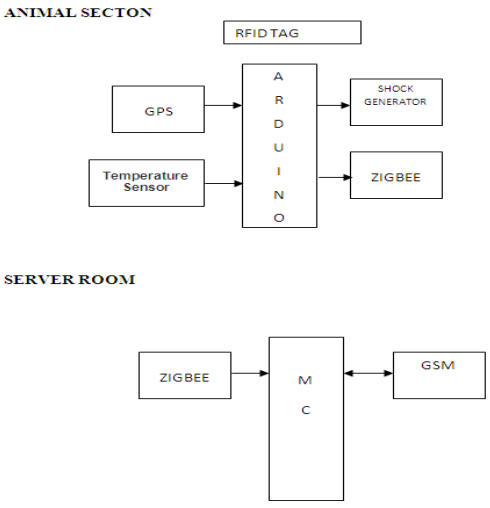
III. EXISTING SYSTEM

1) Manual methods for monitoring fire and trees using watch towers.
2) Fire detection through video surviellance which makes use of infrared detectors and cameras.
3) Satellite imagery technique.
4) E-fencing to keep the animals within boundary of forest
5) Face detection techniques to identify the type of animal.

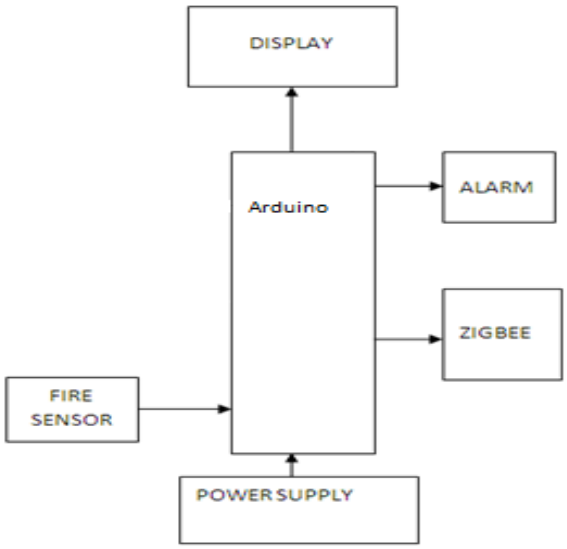
IV. PROPOSED SYSTEM

1) Uses wireless sensor network which gives timely response to the server room.
2) Makes use of flame modules and flex sensors that can detect the mishaps at early stages.
3) RFID tags and readers to monitor animals as well as their species.
4) Sensor nodes can operate for long time with small batteries.
5) Makes use of embedded technology with zigbee and GSM that can send information to the concerned forest authority without delay

V.Block Diagram



Tree Section



VI. SYSTEM REQUIREMENT AND SPECIFICATIONS

Software Requirements

- ARDUINO Suite
- Embedded C

Hardware Requirements

- Arduino
- RFID
- Temperature Sensor
- 8051 microcontroller
- MAX232
- Zigbee Transceiver
- GPS module
- Fire sensor
- Relay with driver Circuit
- Keypad
- LCD
- Flex Sensor

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