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An Automatic Wild Life Tracking System Using GPS and WSN

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***Abstract*: Every living creature on this earth has equal importance in the ecosystem. But nowadays life of wild animals is in danger. Wild animals used to move freely in the forest or in the jungle. If any accident happens to them in the forest, physical injury or any disease may cause even death of animals in the forest. In such situations we cannot find out exact location of animal every living creature on this earth has equal importance in the ecosystem. To avoid such problems in the finding exact geographical location of animal in the jungle, national park or in wildlife reserves, wildlife animal tracking system is used. It also reduces the rising fatalities in a human animal conflict and also drastically reduces zoo thefts.**

***Keywords*: GPS technology, human-animal conflict, monitoring, tracking wild animals, location.**

1. Introduction

To prevent animal epidemics, the state of health of each individual animal requires careful monitoring by humans to procure early treatment to the sick animals. However, due to the large number of animals on a feedlot, it is very time consuming and costly and thus almost impossible to use people to visually monitor each and every animal frequently. In this work we are using GPS to locate the animal in zoo or forest. If any accident happens to them such as any physical injury, any health issue or any other problem in the forest or zoo, we are using WSN, so that we can check their health status. Wireless Sensor Network (WSN) is considered as a collection of sensors devices, called sensor nodes, which are linked by means of wireless communication channels to achieve distributed sensing tasks.

2. System Description

The main aim of this system is to gather the live location of the wild animals with the lowest power consumption possible so that the forest department officers and other concerned department members will be able to know the location of wild animals and tracking them will be easy. Figure 1 shows the block diagram of the device.

1) GPS

GPS is used which is L80 GPS module with an embedded patch antenna (15mmx15mmx4mm) and LNA brings high performance of MTK positioning engine to the industrial applications. It is able to achieve the industry's highest level of sensitivity, accuracy and TTFF with the lowest power consumption in a small-footprint lead-free package. With 66 search channels and 22 simultaneous tracking channels, it acquires and Tracks satellites in the shortest time even at indoor signal level.

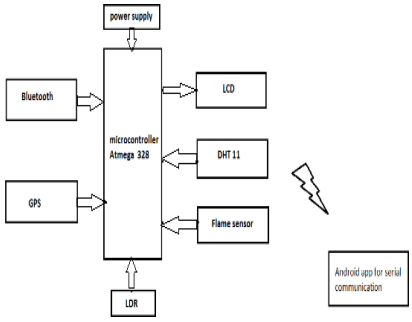

Fig. 1. Block diagram

2) Flame Sensor

Infrared Flame Sensor is used here, which will detect the presence of fire or flames. In extremely hazardous environments, flame sensors work to minimize the risks associated with fire. Infrared flame sensors are designed to work within the infrared spectral band. When an explosion occurs, certain hot gasses will emit patterns in the infrared region which can then be analyzed using a specialized thermal imaging camera.

3) DHT11- Humidity Sensor

The DHT11 is a basic, ultra-low-cost digital temperature and humidity sensor. It uses a capacitive humidity sensor and a thermistor to measure the surrounding air, and spits out a digital signal on the data pin (no analog input pins needed). It's fairly simple to use, but requires careful timing to grab data. The only real downside of this sensor is you can only get new data from once every two seconds, so when using our library, sensor readings can be up to two seconds old.

4) LDR- Light Dependent Resistor

Light dependent resistor is used, which is light-controlled variable resistor. The resistance of a photo resistor decreases with increasing incident light intensity, in other words, it exhibits a photoconductivity. A photo resistor can be applied in

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light-sensitive detector circuit, and light- and dark-activated switching circuits.

5) 16x2 LCD

Liquid Crystal Display screen is used to show all the data collected from the sensors. LCD screen is a electronic display module and find a wide range of applications. A 16x2 LCD display is very basic module and is very commonly used in various devices and circuits. These modules are preferred over seven segments and other multi segments LEDs. The reasons being: LCDs are economical; easily programmable; have no limitation of displaying special & even custom characters (unlike in seven segments), animations and so on.

6) Bluetooth HC-05

HC-05 module is an easy to use Bluetooth SPP (Serial Port Protocol) module, designed for transparent wireless serial connection setup. Serial port Bluetooth module is fully qualified Bluetooth V2.0+EDR (Enhanced Data Rate) 3Mbps Modulation with complete 2.4Hz Radio transceiver and baseband. It uses CSR Blue core 04-External single chip Bluetooth system with CMOS technology and with AFH (Adaptive Frequency Hopping Feature). It has the footprint as small as 12.7mmx27mm.

3. Potential Impact

The previous tracking systems used only have GPS for the tracking of the animals. And here we have used some more sensors due to which we can keep track on not only the location of the animal but also track of animal's health. Hence, this system is more useful than the previous ones.

4. Conclusion

In recent days, most of the species are getting extinct. Most of the species have become rare. Thousands were in danger of extinction and various species are on the margin of elimination. Automatic tracking and alert system overcome the problem of human and animal injury and death due to the drifting of wild animals out of the national park and wildlife sanctuaries. This system is flexible, efficient and easy for an implementation process and can be more beneficial for monitoring wildlife related complexities like poaching, accidents, train delays, destruction of vegetation and threat for human life on the occasion of deviating of wild animals out of their habitation zone. Also it's more helpful to keep track on the animal health.

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