Virtual Fencing System and Tracking System for Wild Animals

[1] P.Venugopal [2] Venkatesh.N, [3] Rakshith.R.N, [4] Praveenkumar, [5] Nithyashree.R .V
[1] Assistant Professor [2][3][4][5] UG Scholars
[1][2][3][4][5] Department of Electronics and Communication Engineering
Sri Sairam College of Engineering, Anekal, Bengaluru - 562 106

Abstract - **Animal detection plays a vital role in daytoday life. It is important to detect the presence of animals entering into the human living are as near the forest, since it causes damage to life of people living near by the forest areas. It is important to safe guard the life of human by detecting the presence of animal and take necessary actions tosafeguard human life. It is also equally important to save the animals. In order to over come the above drawback a Monitoring System must be developed. This paper involves recognition of animal at the forest boundaries and alert their presence to forest officers The Microcontroller is the heart of the system. It controls every component of the system. TheLCD monitors display, if the animal has been detected. Buzzer is used for alerting. With the help of GSM the Alert message is sent to authoried persons.**

I. INTRODUCTION (HEADING 1)

Researches regarding animal detection have been an important field to numerous applications. Many algorithms and methods have been developed by human being in order to have a better understanding on animal behavior. Besides, the applications it can also acts as a warning system to human beings from intrusion of dangerous wild animals for early precautionary measures. These applications can be narrowed down to three main branches, namely detection, tracking and identification of animals. The animal tracking is the main topic in monitoring animal locomotive behavior and its interaction with the environment. With the technology of sensor, radio-frequency identification(RFID), and global positioning system (GPS), one of the applications is the development of new zoological systems for animal tracing ability, identification, and anti-theft for the management and security of animal in zoo. By tracking the animal movements, it helps human to have a better understanding on living creatures on earth, especially on how the animal interacts with its environment.

II.LITERATURE SURVEY

Unmanned aerial vehicle based forest fire monitoring and detection using image processing technique. 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. This paper presents a forest fire monitoring and detection method with visual sensors onboard unmanned aerial vehicle (UAV). Both

Color andMotion 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 areconducted to demonstrate the effectiveness of the studied forest fire detection methodologies.
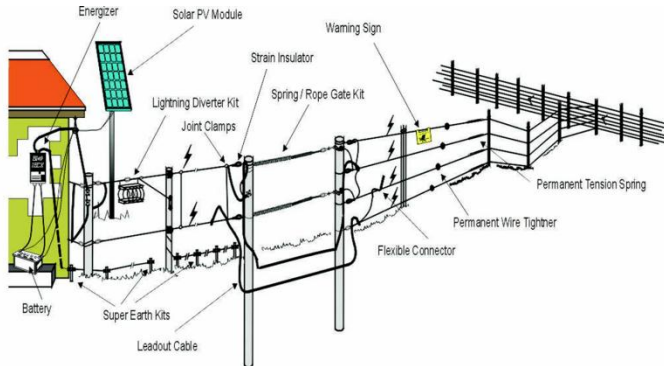
III. EXISTING SYSTEM

When an animal or human being comes into contact with the electric Fence, they receive a sharp, short, painful but safe electric shock. The shock does not cause any physical damage. The electric fence acts as a strong psychological barrier as any intruder avoid coming into contact with the electric Fence once they experience the shock. After a period of conditioning, the mere presence of the fence acts as an effective barrier even if it is not powered 'ON'.

Electric fence can be made to detect a fault on the fence like shorting or cutting of the wire due to tampering on the fence with the Alarm system.

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Drawbacks:

•   The physicalfence harms animals or human beings.

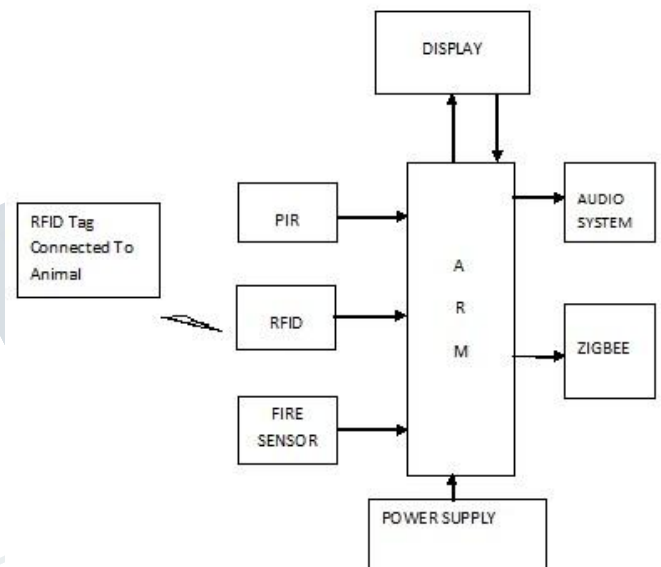
•   Battery maintenance is more

•   Chances of fence breakage

•   Utilizes huge capital & high maintenance

•   Chances of animals death
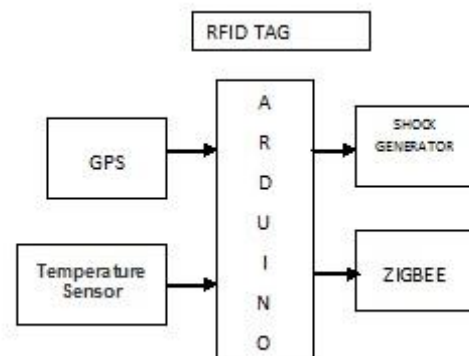
IV.   PROPOSED SYSTEM

The proposed project is about to save endangered animals and to prevent animals from crossing the forest boundaries. The components we are using to implement this project are microcontroller, GPS tracking system, RF transmitter and receiver system [300mts range] and the biosensors. The transmitter unit is consisting of Transmitter along with biosensors and GPS system, these transmitters are being tied in the neck of wild animal. The receiver system consists of microcontroller unit with peripheral interfaced devices such as RF receiver, GSM (SIM 800c) and the audio system. As the animal tend to cross the forest boundaries, a radio pulse emitted by RF transmitter where it is received at forest boundaries by RF receiver.as radio pulse is received an alert information is sent to the control room with the help of GSM, in order to prevent animal not cross the boundary a response sound is produced by APR unit (based of the species different sounds will be produced). The installed GPS provides the location of the animal whenever there is a

medical emergency or any other security emergency this feature helps in fast rectification of the issue. Bio-sensors monitor the animal's health condition as well as the internal organ function. The information about any danger to the animal could be found based on the pulse rate and other movements of animal. Based on all these features the wild animals could be protected and a virtual fencing is established for animals.
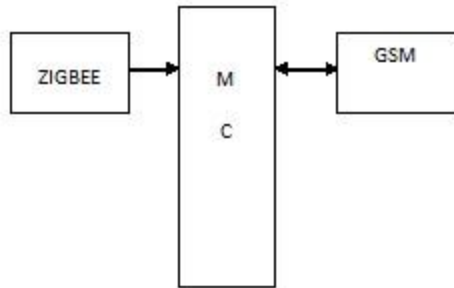
BOUNDARY SECTION:

ANIMAL SECTION:

SERVER ROOM:

V. EQUIPMENT PLATFORM

A. MICRO CONTROLLER

The LPC2141/42/44/46/48 microcontrollers are based on a 16-bit/32-bit ARM7TDMI-S CPU with real-time emulation and embedded trace support, that combine microcontroller with embedded high speed flash memory ranging from 32 kB to 512 kB. A 128-bit wide memory interface and a unique accelerator architecture enable 32-bit code execution at the maximum clock rate. For critical code size applications, the alternative 16-bit Thumb mode reduces code by more than 30 % with minimal performance penalty.

B. ARDUINO

The Arduino 2560 is a micro controller boardbased on theATmega 2560. Ithas 54 digitalinput /outputpins (ofwhich 14 can beusedas PWM outputs), 16analoginputs,4UARTs (hardware serial ports), a16MHz crystal scillator, aUSB connection, apower jack, an ICS Pheader, andareset button.It contains everything needed to support the microcontroller; simply connectit to a computer with a USB cableor power it with a AC-to-DC adapter or battery to get started.The Megais compatible with most shields designed for the Arduino Duemilanoveor Diecimila.

C. GLOBAL POSITIONING SYSTEM

The Global Positioning System (GPS) is a space-based global navigation satellite system (GNSS) that provides reliable location and time information in all weather and at all times and anywhere on or near the Earth when and where there is an unobstructed line of sight to four or more GPS satellites. Our new GPS kit is patch antenna based GPS with RS232 extension for up to 5mts cable. Due to damages in external antenna (SMA connector) we are now switching to patch antenna.

D. GSM

GSM is a cellular network, which means that mobile phones connect to it by searching for cells in the immediate vicinity. The coverage area of each cell varies according to the implementation environment. GSM networks operate in a number of different carrier frequency ranges (separated into GSM frequency ranges for 2G and UMTS frequency bands for 3G), with most 2G GSM networks operating in the 900 MHz or 1800 MHz bands. Where these bands were already allocated, the 850 MHz and 1900 MHz bands were used instead (for example in Canada and the United States). In rare cases the 400 and 450 MHz frequency bands are assigned in some countries because they were previously used for first-generation systems.

E. RADIO FREQUENCY IDENTIFICATION

Radio-frequency identification (RFID) is a technology that uses communication via radio waves to exchange data between a reader and an electronic tag attached to an object, for the purpose of identification and tracking. Some tags can be read from several meters away and beyond the line of sight of the reader. The application of bulk reading enables an almost parallel reading of tags. Radio-frequency identification involves interrogates (also known as readers), and tags (also known as labels).Most RFID tags contain at least two parts. One is an integrated circuit for storing and processing information, modulating and demodulating a radio-frequency (RF) signal, and other specialized functions. The other is an antenna for receiving and transmitting the signal.

F.DISPLAY

An LED lamp is a solid-state lamp that uses light-emitting diodes (LEDs) as the source of light. The term LED light bulb is also colloquially used. Here in the system the LED is controlled by the microcontroller in order to indicate whether the passenger has got the access to board the travel or not. These are got to know by the system by accessing the RFID. If the red LED glows, it indicates access denied or not

G.ZIGBEE

Ability to connect in mesh network allows Zig bee to provide more range compared to other wireless
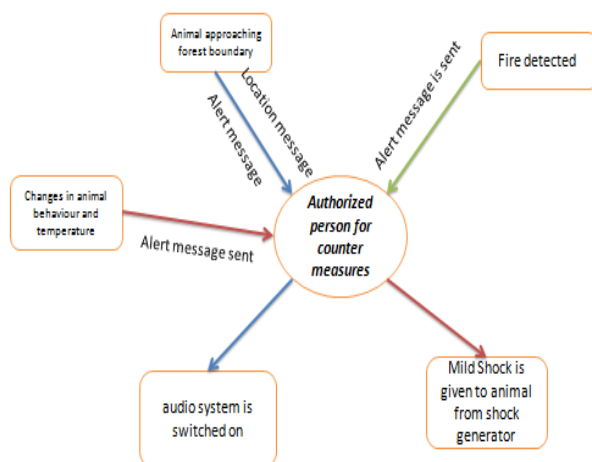
technologies such as "INFRARED", "BLUETOOTH" etc. In addition, it also provides high reliability of the data reproduced at receiver. It also consumes less power in communicating data between its transmitter and receiver, which means longer life with smaller batteries. The primary reason for low power consumption in Zig bee devices is that they work on very small duty cycle that helps them to have a longer life span. Variation in duty cycle depends upon the application usage, for example, some applications need data more frequently like in health centers compared to others such as home automation systems.

H. TEMPERATURE SENSOR

Temperature sensors are vital to a variety of everyday products. For example, household ovens, refrigerators, and thermostats all rely on temperature maintenance and control in order to function properly. Temperature control also has applications in chemical engineering. Examples of this include maintaining the temperature of a chemical reactor at the ideal set-point, monitoring the temperature of a possible runaway reaction to ensure the safety of employees, and maintaining the temperature of streams released to the environment to minimize harmful environmental impact.

I. IR SENSOR

The purpose of the transmitter is to transform the information we want to send into a signal that can be propagated by the channel. In the case of our wired copper channel, this means we want the information to be transformed into a modulated voltage level, something like the pulse train. For a wireless channel, however, the transmitter needs to encode the information onto an EM wave that can be easily propagated.

VI. SYSTEM OPERATION

The prototype operates in two different units, where each unit perform unique operation. These operations are continuously monitored by authorized person (forest officer) so that necessary counter measures could be taken in time.

When animal approach the boundary an alert message as well as APR unit is switched on similar operation is done when wild fire detected.

VII. CONCLUSION

A prototype of an animal health monitoring system is presented. The prototype system consist of transmitter module and receiver module this project may be implemented in the wild life sanctuaries in addition to this wildfire accident's in the forest could be stopped by alerting the concerned people(forest executive's).this project can also be implement in the houses where there are pet animals, it specifically targets health monitoring during races, animal location and tracking applications .this technology present very high low power consumptions, low complexity and time domain resolution. The developed module has been data transmitting range only up to 2 meters in order to obtain greater distance transmission RF transmitter and receiver section should be replaced with high frequency transmitter and receiver.

REFERENCES

The template will number citations consecutively within brackets [1]. The sentence punctuation follows the bracket [2]. Refer simply to the reference number, as in [3]—do not use "Ref. [3]" or "reference [3]" except at the beginning of a sentence: "Reference [3] was the first . . ."

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