Paper ID: IOTTSF11

RESEARCH ON WIRELESS MODEL FOR MONITORING WILD ANIMALS

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Abstract— **In today's life, preservation and monitoring of wild animals is given more importance for preserving of various endangered species. In this paper, we developed an model for detecting temperature, behavior & health wild animals. Wildlife monitoring system has progressed vastly in various domain with the developments in wireless sensor network (WSN) system.**

Keywords—**Wireless sensor network, wild animal, radio frequency (Rf) , PTD.**

I. Introduction

Wireless sensor network is a collection of sensors devices which are linked by means of wireless communication channels. A sensor node in the wireless sensor network is a small device which is capable of collecting data from the surrounding regions. This concept is use for finding exact geographical location of animals in national park or wild life reserve. , we developed an model for automatic detection of moving wild animals. Wireless sensor network grows and rapidly improves, this enable the new communication services. Sensor networks are the most useful way to collect the various parameters and information needed by environments Whenever we need to install a sensor network then it must be fast, easy to install and maintain. Sensor network basically consist of large amount of sensor nodes that are deployed to large physical area to monitor and detect the real time environmental activities. These sensor nodes works together to collect the data like temperature.

Advancements in wireless communication technology, availability of lightweight, compact and portable computing devices along with integrated and miniaturized sensors have made distributed sensing and computing possible and practical. A wireless sensor node is a battery-operated device, capable of sensing physical quantities, data storage, limited amount of computational and signal processing capability and wireless communication. A Wireless Sensor Network (WSN) consists of a large number of wireless sensor nodes working collaboratively to achieve some common objective. WSN can have one or more sinks or base stations which collect data from sensor nodes. These sinks act as an interface through which the WSN interacts with the outside world. †For years

an animal tracking system has been used to analyze animal behaviors for many reasons, such as to observe a migration pattern and environment interaction, evolving demands of animal ethologists, ecologists, natural resource manager. A network of wireless sensor nodes can be used to collect information from a variety of applications including military, environmental, medical, habitat monitoring, and scientific applications. The wireless sensor network is deployed with hundreds or thousands of wireless sensor nodes. In this paper, habitat monitoring application is carried out, where the sensor node is deployed for monitoring tigers is presented. Tiger, the lord of jungles is the national animal of India. India has nearly half the total population of the tigers in the world. Indian government launched the first project named Project Tiger in 1973 to protect the royal animal. In animation creation field, any cartoon and animation films include many moving figures, humans, animals and plants which are the essential elements of the animation films. However, the figure motion design is by no means an easy job. In traditional cartoon creations, the motion of a figure must be drawn on paper, frame by frame, with each frame drawn slightly different, costing a lot of time and patience of the painter. In recent years, some professional animation software tools have been developed, such as Maya, Softimage, and so on. With these tools, the figure modeling and motion design are getting more easily. However, they are usually expensive for ordinary people and difficult to grasp.

I. II. LITERATURE SURVEY PAPER

A. *Wireless Sensor Network Techniques for Monitoring Activities of Wild Animals.*

In this paper Wildlife monitoring system has progressed vastly in various domain with the developments in Global Positioning System (GPS) and wireless sensor network(WSN) system. In this paper, a study on wild animals monitoring techniques is made and papers related to animal tracking and monitoring is studied . Also the paper states various approach that are used for wild animal monitoring activities.

Fig. A : General scenario of EcoNet

With the advancements in WSN the real-time collected data from the camera-traps can be wirelessly transmitted to a remote station through wireless protocols. This will tremendously reduce the human requirements and delay in the monitoring of wild animals. The wireless sensor nodes are capable of self-organizing a network and the nodes will communicate with each other by the use of wireless interfaces. The sensing node is able to measure and record the position, posture and activity of the animals. When a sensor node detects some data, it reports the event to the sink with wireless communication capabilities and network topology.

B. The Design and Implementation of Video-based Interactive Motion Tracking Model

In this paper, a simple yet efficient method to model object motion track is designed and implemented. The moving tracks of any objects can be tracked interactively, and a motion model can be formed and adjusted for later use. The model can be saved as files, leaving an open interface for other applications to access. The model is significant in the animation and cartoon design and production, and can be applied in other digital media fields.
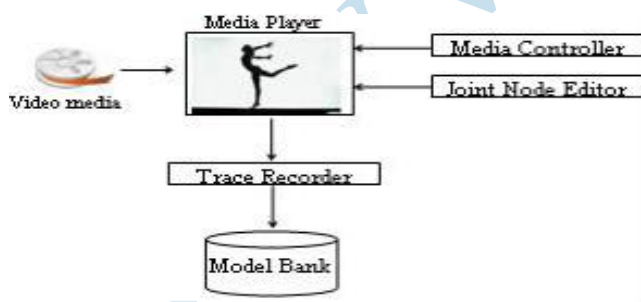

Fig B: System architecture of motion tracking

The components of the modeling system are shown in Fig. B. The media player is used to select video media to play. The Media Controller is used to send command to Media Player, such as play, pause, forward, backward, etc. It is used to traverse through frames in the video to locate the desired frame on which joint nodes are to be put and positioned.

C. Automatic Detection of Moving Wild Animals in Airborne Remote Sensing Images.

In this paper, they developed an algorithm for automatic detection of moving wild animals in the snow in airborne remote sensing. This is the first report on automatic detection of wild animals from remote sensing images except infrared thermal imagery in Japan.
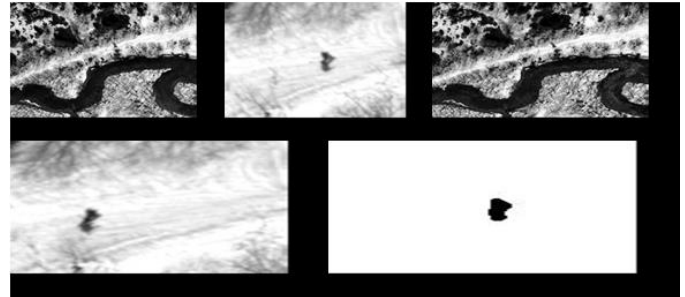

Fig. C Automatic detection of moving animals.

D. A Multistatic Radar Array for Detecting Wild Animals During Pasture Mowing.

In this paper, we present a detecting method which is based on microwave signals. This incoherent radar system uses antennas arranged as a matrix and a signal superposition principle. It detects the reflection signature of covered targets of a certain shape - e.g. metals or objects with high water content. The low computing power needed allows a large area to be scanned within a short time. Since this radar system is almost completely insensitive to vertical movement of the extension arm, it can be mounted on a fast driving vehicle.
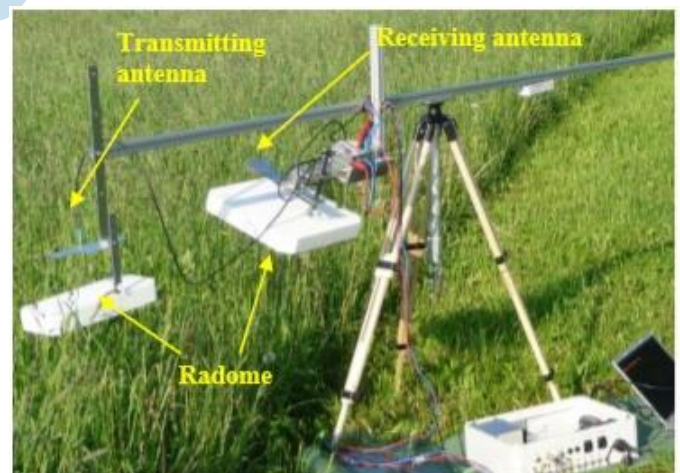

Fig D: Multistatic radar measurements with a tripod.

There are many degrees of freedom how the antenna m can be arranged relative to the ground. So, before equipping an extension arm completely with the antennas, measurements with two single antenna elements are carried out which allows following adjustments: the antenna height over ground, the inclination angle of the receiving antenna, the misalignment between transmitting antenna and target (important for determining the distance between the transmitting antennas). The measurement is carried out with an extension arm

mounted on a tripod. This allows the superposition of different measurements with different antenna positions emulating an entire multistatic system. A rotary encoder enables an accurate superposition of the individual signals as shown in fig.D

III. Formulation of Present Work

A. RTD:-

It is the RESISTANCE TEMPERATURE DETECTOR, is the name implies are sensor used to measure temperature by correlation the resistance of RTD throughout with temperature.

Fig.E. WSN Model

RTD are relatively immune to critical noise and therefore will suited for temperature measurement in industrial environment especially around motors, generators and others high voltage equipment.RTD are the platinum metal construction, you can use the construct $0.00385\Omega/\Omega/$degree c to approximate the resistance change our temperature for the platinum RTD element. Resistance thermometers are constructed in a number of forms and offer greater stability, accuracy and repeatability in some cases than thermocouples. While thermocouples use the See beck effect to generate a voltage, resistance thermometers use electrical resistance and require a power source to operate.

B.7812 voltage regulator IC:-

7812 is a famous IC which is being widely used in 12V voltage regulator circuits. Truly speaking it is a complete standalone voltage regulator. We only need to use two capacitors, one on the input and second one on the output of 7812 in order to achieve clean voltage output and even these capacitors are optional to use. To achieve 12V 1A current, 7812 should be mounted on a good heat sink plate. Thanks to the transistor like shape of 7812 which makes it easy to mount on a heat sink plate. 7812 has built in over heat and short circuit protection which makes it a good choice for making power supplies.
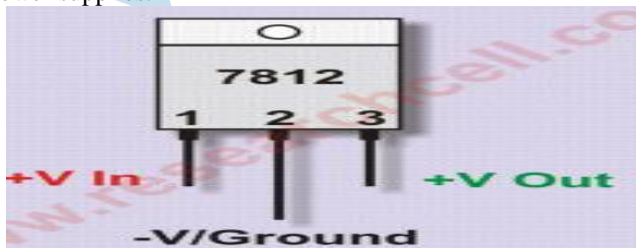

Fig.F 7812IC

C. 7805 voltage regulator IC:-

7805 is a voltage regulator integrated circuit. It is a member of 78xx series of fixed linear voltage regulator ICs. The voltage source in a circuit may have fluctuations and would not give the fixed voltage output. The voltage regulator IC maintains the output voltage at a constant value. The xx in 78xx indicates the fixed output voltage it is designed to provide. 7805 provides +5V regulated power supply. Capacitors of suitable values can be connected at input and output pins depending upon the respective voltage levels.
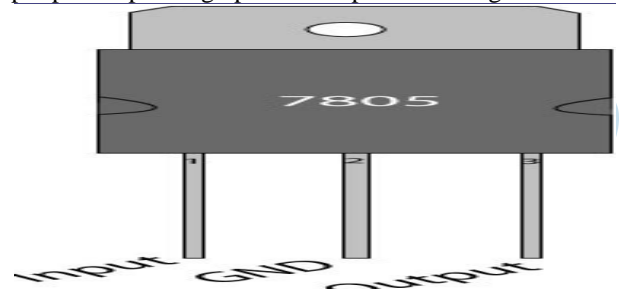

Fig.G.7805IC

IV.Design of Implementation

A.PCB

The PCB of the microcontroller circuit is printed on an copper plate.There are 40 pin microcontroller and two 7pin IC for impedance matching The first step is to replicate the pattern in the fabricator's CAM system on a protective mask on the copper foil PCB layers. Subsequent etching removes the unwanted copper.
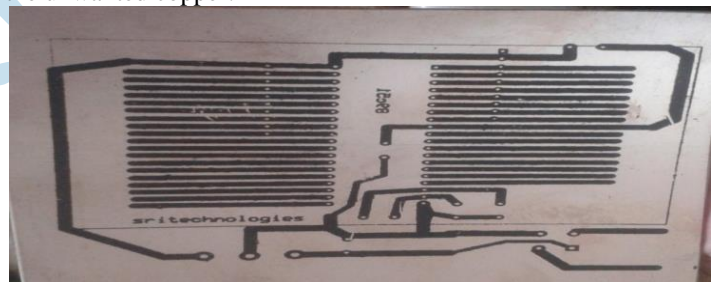

Fig.A. PCB printing

B.Etching Process

Copper plate is dipped in a ferric chloride solution. Chemical etching is usually done with ammonium per sulfate or ferric chloride. For PTH (plated-through holes), additional steps of electro less deposition are done after the holes are drilled, then copper is electroplated to build up the thickness, the boards are screened, and plated with tin/lead. The tin/lead becomes the resist leaving the bare copper to be etched away.

Fig.B. Etching Process

Etching Process is done by a blade it means after PCB the design is slightly scratch through a blade remove all black line of copper plate.

Fig.B1.fter removing PCB

C.Soldering & Drilling

Holes through a PCB are typically drilled with small-diameter drill bits made of solid coated tungsten carbide. Coated tungsten carbide is recommended since many board materials are very abrasive and drilling must be high RPM and high feed to be cost effective. Drill bits must also remain sharp so as not to mar or tear the traces. Drilling with high-speed-steel is simply not feasible since the drill bits will dull quickly and thus tear the copper and ruin the boards.

Fig.C. Soldering & Drilling

V. Design of Experimental Instrumentation

A. Transformer

A transformer is an electrical device that transfers electrical energy between two or more circuits through electromagnetic induction. Commonly, transformers are used to increase or decrease the voltages of alternating current in electric power applications.

Fig.A. Transformer

A varying current in the transformer's primary winding creates a varying magnetic flux in the transformer core and a varying magnetic field impinging on the transformer's secondary winding. This varying magnetic field at the secondary winding induces a varying electromotive force (EMF) or voltage in the secondary winding. Making use of Faraday's Law in conjunction with high magnetic permeability core properties, transformers can thus be designed to efficiently change AC voltages from one voltage level to another within power networks.

B. LCD

Standard HD44780 LCDs are useful for creating standalone projects. 16 characters wide, 2 rows White text on blue back ground Connection port is 0.1" pitch, single row for easy bread boarding and wiring Pins are documented on the back of the LCD to assist in wiring it up Single LED backlight included can be dimmed easily with a resistor or PWM and uses much less power than LCD with EL (electroluminescent) backlights Can be fully controlled.

Fig.B. LCD Display

C.Relay

In this steps, I connect the output of the 315M RF kit receiver to Relay module, if the receiver receives command

from the emitter, it will output signal to trigger the relay, thus to ignite the firecracker. Connect the "VT" terminal of the 315M RF Kit receiver to the "SIG" of the relay module. The logic voltage on "VT" terminal will get "HIGH" when pressing any of the button on the emitter.

VI.CONCLUSION

This paper we study on various Wireless Sensor Network Techniques for Monitoring Activities like temperature, behavior, health of Wild Animals has been done. I have reached to the conclusion that all the various techniques have certain drawbacks such as high power consumption and low data processing efficiency. Thus I have reached to the conclusion that using radio frequency may reduce cost of sensor network as replacement of GPS and thus may lead to efficient sensor for saving wild animals.

REFERENCES

[1] Yu Oishi and Tsuneo Matsunaga" Automatic detection of moving wild animals in airborne remote sensing image" University of Tsukuba National Institute for Environmental Studies 2010 IEEE.

[2]Jingchang Pan,Qiang Guo "The Design and Implementation of Video-based Interactive Motion Tracking Model" Shandong University at Weihai, Weihai, Shandong, China, 264209 , Shanghai University Shanghai, China, 200072 , 2008 IEEE.

[3]Ruchi Mittal, M.P.S Bhatia "Wireless sensor networks for monitoring environmental activities" Department of Computer Science and Engineering, Netaji Subhash Institute of Technology, New Delhi, India and Department of Computer Science and Engineering, Netaji Subhash Institute of Technology, New Delhi, India, 2010 IEEE.

[4]A.Fackelmeier, E.M. Biebl "A Multistatic Radar Array for Detecting Wild Animals During Pasture Mowing" Fachgebiet Höchstfrequenztechnik, Technische Universität München Munich, Germany 30 September - 2 October 2009, Rome, Italy.