SEISMIC SENSOR SYSTEM TO TAME THE HUMAN ELEPHANT CONFLICT

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Abstract

The Human-elephant conflict is one of the most severe natural problem in south India.There are rich farmlands near the elephant habitats and elephant raid these farms in search of food. Frequent clashes between wild elephant and villagershave resulted in severe damage to property, as well as lost of lives for both humans and elephants. This has been the main cause for nearly 70 human deaths and over 200 elephant deaths that have been recorded each year in the recent past.To manage the problem, the goverment has initiated projects that secure the national wildlife parks with electric fences.The electric fence that runs around the wildlife sanctuaries provides a convenient means for data communication.Male elephant hit the ground with their feet causing ground vibrations.Since the feet of the elephants are equipped with very sensitive vibration sensors,it provides them with a unique communication ablility.Proper calibration of sensors is therefore the biggest challenges in this method.so that in any unconditional times the informations are passed through GSM.

Keywords :Seismic sensor ,Vibration sensor, GSM, Microcontroller, Electric fence.

I.INTRODUTION

Animal detection system is to reduce human-elephant conflict and also reduce elephant accident by train.It also one of the problem in nowdays.Elephants that escape from the wildlife national parks venture into villages creating destruction in their wake. To prevent such mishaps, a proper system is required to contain and monitor elephants in national parks. Here we describe different approaches to detect elephants and possible ways of monitoring the national wildlife parks.The electric fence that runs around the wildlife sanctuaries provides a convenient means for data communication.Because of all the time electric fied fence small birds and animals cause dead due to high level of voltage beyond their resistive power.This avoided by proposed system.

The feet of the elephants are equipped with very sensitive vibration sensors, it provides them with a unique communication ability. Studies show that the ground vibrations caused by each animal type takes a unique

form. By placing vibration sensors along known elephant paths, seismic waves can be used to alert the presence of elephants and thereby providing another means of from different terrains are unlikely to correlate.GSM system automatically sends information.

Since ancient times, villagers have learned to protect their crops from wild elephantsconservation in human-dominated landscapes and there are few empirical studies to demonstrate that electrified barriers are effective in deterring elephants from raiding crops. The factors determining the effectiveness of electric fences are not fully understood.Maintenance of effective non-electrified fences and proximity of fences to areas of high elephant concentration are significant determinants of fence performance in mitigating elephant crop-raiding [1].Abstract White-tailed deer may cause more damage than any other species of wildlife.One practical method of controlling deer damage is the use of exclusionary fences[2].We explore the types of human-elephant conflict (HEC) that occur and investigate their impacts upon rural communities.A broad definition of human-elephant conflict is any human-elephant interaction which results in negative effects on human social, economic or cultural life, on elephant conservation or on the environment. [3] proposed a system about Efficient Sensor Network for Vehicle Security. Today vehicle theft rate is very high, greater challenges are coming from thieves thus tracking/ alarming systems are being deployed with an increasingly popularity . We explore the types of human-elephant conflict (HEC) that occur and investigate their impacts upon rural communities. We then discuss who has had

localization. However, the sensitivity of seismic sensors varies from one terrain to another – which means that data gathered

responsibility for HEC management through history. By means of case studies we then examine current strategies for elephant management across Africa and identify the key problems facing elephant management[4].

II.SYSTEM ARCHITECTURE

This section describes the conceptual design of seismic sensor based animal detection system(ADS) is shown in (fig.1).The ADS has sensor system ,GSM module and electric fence.Sensor system is collection of seismic sensor and vibration sensor.Itdectet the crossing animals.Microcontroller process the input and produce two outputs.One is data send from field to control room.The animal information transmitted and received using GSM technology. Another is an electric fence is barrier that uses electric shocks to deter animals from crossing a boundary.
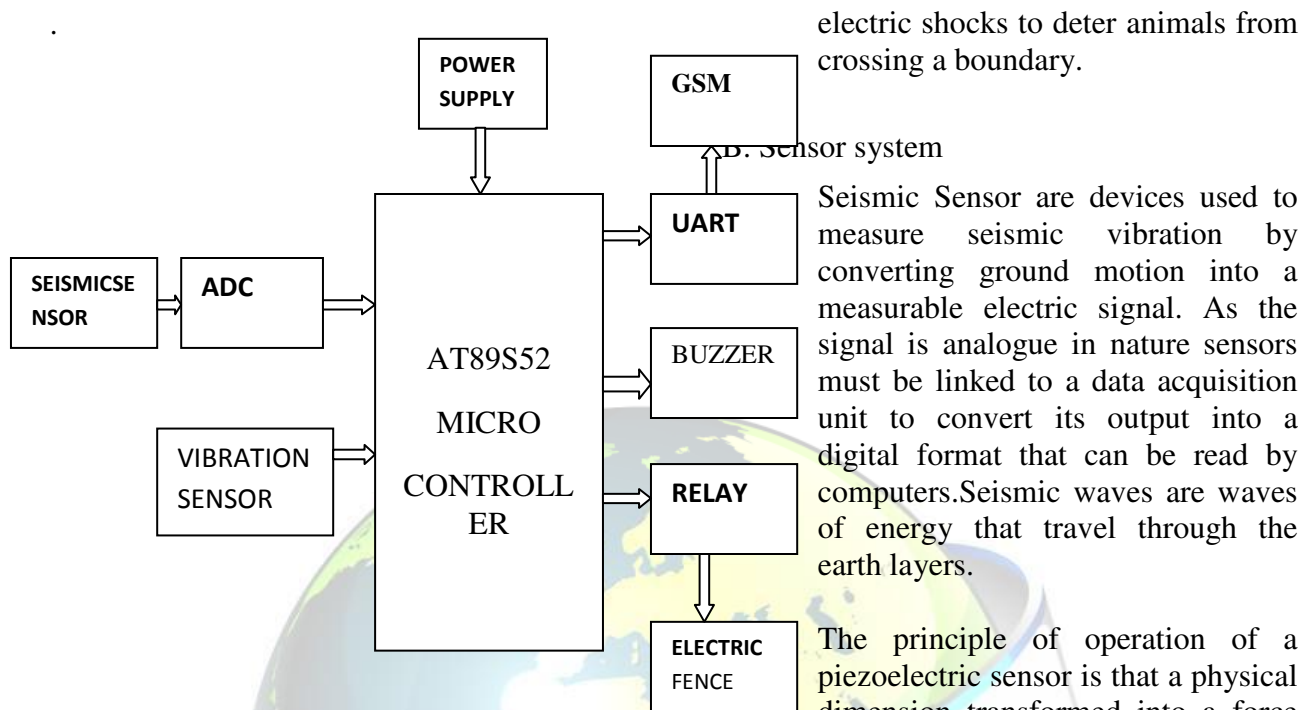
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Fig.1 Block diagram

HARDWARE SYSTEM DESIGN

A. Microcontroller (Atmel AT89S52)

The AT89S52 is a low-power, high-performance CMOS 8-bit microcontroller with 8K bytes of in-system programmable Flash memory.The device is manufactured using Atmel's high-density nonvolatile memory technology and is compatible with the Indus-try-standard 80C51 instruction set and pin out. Microcontroller is a powerful which provides a highly-flexible and cost effective solution to many embedded control applications . Microcontroller processes the input and produces two output.One is data from field to control room.Another is an electric fence barrier that uses electric shocks to deter animals from crossing a boundary.

B. Sensor system

Seismic Sensor are devices used to measure seismic vibration by converting ground motion into a measurable electric signal. As the signal is analogue in nature sensors must be linked to a data acquisition unit to convert its output into a digital format that can be read by computers.Seismic waves are waves of energy that travel through the earth layers.

The principle of operation of a piezoelectric sensor is that a physical dimension transformed into a force acts on two opposing faces of the sensing element. The detection of pressure variations in the form of sound is the most common sensor application, which is seen in piezoelectric microphones, and piezoelectric pickups for electrically amplified guitars.

C.GSM Module

GSM (**Global System for Mobile communications**) is the most popular standard for mobile phones in the world. GSM send information from the field to control room.This has also meant that data communication was easy to build into the system. GSM users can send and receive data, at rates up to 9600 bps.GSM was intended to be secure wireless system. The advantage of the GSM is, its Good subjective speech quality, Low terminal and service cost support for international roaming,

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Ability to support handheld terminals.

D.Electric fence

An Electric fence is a barrier that uses electric shock to deter the animals crossing a boundary.Electric fences are designed to create an electric when touching by a person or animal.Acomponent called a power energier   convert power into a brief high voltage pulse .one terminal of the power energier release an electric pulse,another terminal connected to a metal rod implanted in the earth.A Human or animals touching both the wire and the earth during a pulse will compute an electric circuit and will conduct the pulse causing an electric shock. In this paper, the electric fence will turns ON only when only the elephant is detected but cannot turn ON while birds, other animals are crossed the boundary.

III. SOFTWARE SYSTEM DESIGN

A. Keil uVision4

The keil uVision4 IDE fully integrates Cx51 version 8 and provides control of the compiler,Assembler, Real-time OS, project Manager and Debugger in a single intelligent environment. Keil uvision4 IDE(integrated Development Environment) is a Windows based front end for the CComplier and assembler.Keilu vision4 is used for writing embedded C program. Embedded C is a high level language,which includes many aspects of the ANSI(American National Standard Institute) C programming language.This software is mainly used to activate microcontroller according to the input received by it. "Embedded C"code is written using this work bench. In this project, coding is written for GSM and relay circuit measuring the vibration fall detection of elephant of which is interface with AT89S52 Microcontroller Board at the transmitter end. As per the code embedded in the controller, the interface modules generate appropriate output at the receiving end.

B. Proteus

Proteus8 is a best stimulation software for various design with Microcontroller. It is mainly popular because of availability of almost all microcontroller in it. After simulating your circuit in Proteus8 software you can directly make PCB design.

IV. Results and Discussion

The prototype consists of Microcontroller,Sensor system and GSM module. The sensor system sense the ground motion and sends message in case of high vibration.
The elephant detection sensor detect the high ground motion and alert message send to the control room as will as relay is turned ON and produces electrical shock. The experimental setup is shown in the fig.2

The mobile communication result of elephant detection system as shown in the fig.3

VI. Conclusion

There are two prototype section one is transmitter and another one is receiver. The transmitter consists of temperature senser, vibration sensor is sense the vibration of the elephant. The receiver consists of GSM module and electric fences. In existing system, humans or other animals touch the electric fence it produce the shock and other wild animal dies due to digging a pit. 24 hours of electrified fence so that human,birds and other wild animals gets hurted. The electric fence turn ON when the vibration is high.. In this system, to save wild animals and human beings Many loss of wild animals is prevented

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