Antismuggling System for Trees in Forest Using ADXL Sensor and Zigbee Module

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Abstract:. So many times we are read in the newspapers about the smuggling of the trees like sandal,"Sagwan" etc. These trees are very expensive and also not found in large amount in the world. These trees are used in medical science as well as cosmetics products. But the large amount of money will be sold of such tree woods so much incidents are happened of cutting such tree woods. To limit such smuggling and to save the forests around the earth some preventive actions need to be done. To avoid the smuggling we are developing such a system which can be used in forest.

In this system tree will be having one small electronic unit including of Controller, ADXL Sensor, buzzer, battery and Zigbee transmitter. Tree cutting will be sensed by ADXL sensor and this information will be displayed on LCD in main server unit like as cutting tree name and area simultaneously buzzer will be ON and also message will be transmitted to senior officer using GSM module. Communication between tree unit and main unit is done by Zigbee module.

KEYWORDS: ADXL Sensor, GSM Module, ARM Processor, Microcontroller, Zigbee, MAX232, buzzer, LCD display, Battery

I. INTRODUCTION

We develop a system which is used to limit the smuggling which would in turns remove the de-forestation and protect the environment which helps us to solve the most important problem which is Global Warming.

So we develop the system which is useful to limit such smuggling. Every tree having one unit that is small electronics unit consists of Controller, ADXL Sensor and Zigbee transmitter module. Whenever person tries to cut a tree it will be detected by ADXL sensor and at main server unit information will be display on LCD . The Communication between the tree unit and main server unit will be done by Zigbee transmitter and receiver.

The system consist of 2 stages:

1.Tree unit and 2.Main server unit.

The tree unit is primary unit for the implementation of this system. This unit consist of ADXL sensor which is a 3 axis accelerometer.

This sensor will be responsible to send the information to micro-controller in the tree unit which would be transmitted to the main server unit for other process.

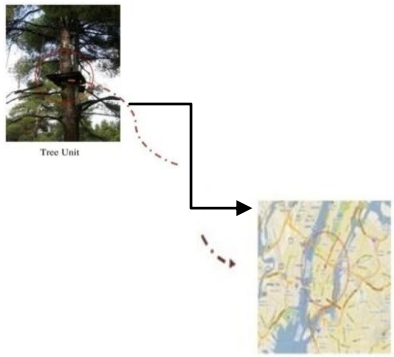

Fig: Functional Block Diagram

Smuggling and illegal logging causes enormous damage to forests, economics of producer countries and local communities. It's a very serious and comprehensive problem. Despite the economic importance of trade in timber and forest products, most of the international countries have no legal mean to stop or halt such activities because technically it's very hard to identify illegally smuggled timber and other trees.

II. LITERATURE SURVEY

First we search the old papers we find that there are three units i.e., tree unit, sub server unit and the tree unit.

In that units three controllers, Zigbee modules and MAX232 are used. So the system becomes more complicated and also this system contain the flex sensor. The drawback of using such sensor is that it gives the accurate reading when it is bend.

This drawback can be avoided by using ADXL sensor which is 3-axis accelerometer. So we use this sensor and also minimize the circuit by reducing these three units into two units.

III. PROBLEM DESCRIPTION

The Antismuggling system for trees in forest is the system which detect tree's current position using ADXL

sensor. This position gives the live updates of tree with their position details. It ensures the tree which has got cutted to send location details i.e, area name and tree name to main unit located at control room further that location details of tree send to senior officer as well as display it on lcd.

As per the system architecture, antismuggling System FOR trees in forest are working same as follows. When the tree cutting will occurred, then the system will direct send the cutting alert message along with location details of the tree area name to control room it will send message to the nearby or far senior officer so that it will go to that location. By using system like this we can decrease the tree cutting rate.

IV. METHADOLOGY

This system is a prototype model of Antismuggling system for trees in forest using the ADXL sensor and zigbee Module working will be made in the following steps:

The sensor detects the x y and z axis position of a tree.

The 3 axis position of the tree is sent to main server unit.

If the position of tree changes to the out of setpoint value then message will be send to main server unit through ZIGBEEE that message will be display on lcd and also message will send to main officer using GSM.

Whenever tree is cutted the position is detected and a message has been sent to the main senior officer

V. SYSTEM BLOCK DIGRAM

This is the block diagram of antismuggling system for trees. This shows the overall view of the tree unit and main server unit circuit. The blocks connected here are LCD display, GSM, ADXL Sensor, Power supply, MAX232, zigbee module, buzzer etc,.

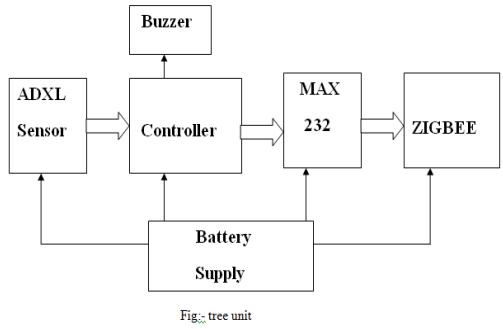

Fig: Block diagram of Tree unit

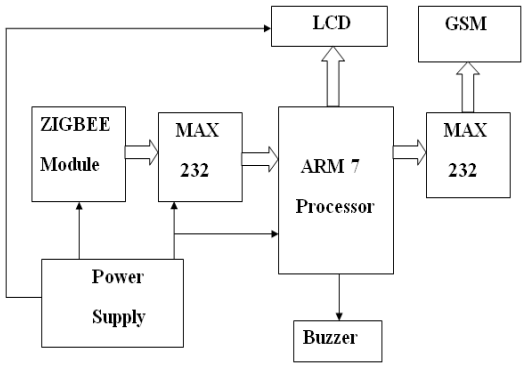

Fig 3.2 : Block diagram of main server unit

ARDUINO:-

It is a 8 bit microcontroller, having high performance and low power. It is an open source electronic prototyping platform enabling user to create interactive objects. It is based on easy to use hardware and software. Arduino consist of both physical programmable circuit board and a piece of software or IDE that runs on computers. We use Arduino to interface with ADXL Sensor, MAX232 Module, and buzzer

ADXL Sensor :-

The ADXL 335 sensor is a thin, small, less power and 3-axis accelerometer. The acceleration measured by product with a minimum full scale range of +/- 3g.

It measures three angles like X,Y,Z of gravity in tilt sensing application resulting from the shock, motion etc. In our project we used this sensor to measure the bending angle of trees to know about whether trees are cutted or not. So it helps us to limit the smuggling of trees.

GSM:-

GSM modem-RS232 it is built with dual band GSM/GPRS SIM900A. It having frequencies of 900/1800 MHz The RS232 cable is used to interface with GSM which allows us to connect microcontroller as well as PC with RS232 chip through MAX232.

GSM modem does not have keypad to interact. It accept commands and acknowledges for those. Every command start with "AT". AT stands for attention. In our simple project, programs wait for mobile number to be entered so that it instruct the modem to send message using a sequence commands.

VI. CONCLUSION

In this manner we developed such a system which is capable to limit the smuggling of trees .In the insecured environment we give protection for trees where humans are incapable to give protection to the trees.

We are developing this system for trees which are expensive and their security is must for us. So we provide security through this method.

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