Smuggling Control in Forest

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Abstract:
From many years we are getting news about smuggling of the trees such as sandal, Sagwan etc. These trees are very expensive and less obtainable in the market. To avoid such type of smuggling and to save the forests around the globe some preventive systems need to be developed. We are forming a system which can be used to restrict this smuggling. This system is built on the embedded platform using arm7 Microcontroller which controls all the processes and cost is very stumpy. The suggested system will consist of two modules which are described below, 1) Tree Unit 2) Main Server Unit (base station). Every tree having one small electronics division which consists of ARM 7, 3 Sensors and GPS module. There will be one area selected. The data of different tree units can be collected by these units. The peach tree unit will give the information to base station using GSM module. At main server GUI using one authorized person who received the message and he will taking action to provide security. By using GPS technology, tree can be tracked and can be identified very easily. This data can be used by concern forest authorities to take preventive action.

Keywords: Tree Unit, Main Server Unit, ARM, GPS module.

I. INTRODUCTION

We are forming a system which can be used to avoid the smuggling of the trees which would in turn stop the deforestation and uphold the Environmental stability, which would help to solve one of the issues with the Global Warming. The tree is having one electronic division, which consists of Micro Controller, Flex Sensor, accelerometer sensor, flame sensor, GPS and GSM module. Tree cutting will be detected by flex sensor, accelerometer sensor. Communication between the trees and server will be done by GSM modules. The system consisting of TWO stages:

A. Tree Unit: The Tree unit would be the primary unit for the implementation of the system. This unit would consist of three sensors to give the information of getting Cut Down the trees, Damage with fire, etc. The tree unit would be the primary unit for the implementation of the system. The tree unit consists of three sensors: 1. Accelerometer Sensor 2. Flex Sensor 3. Flame Sensor. These sensors would be responsible to send the data to the controller on the tree unit which would be then transmitted to the next stage i.e. Tree Unit to the tree unit which has GSM module, for further processing to Base station. This is the second and last stage of the system which would be responsible for gathering the data and facilitate the same to the Main-Server Unit. The Tree unit would consist of GPS module and the Controller is accountable for data transmission from the primary stage to the Final Stage of the Project.

B. Main Server Unit: This unit is responsible for the user interface and displaying the data that was transmitted from the Stage 1. Main server would consist of 1. Storage Device 2. GSM Modem the Tree unit 1 would send the information to the main server unit. The main server unit would consist of the GSM Module (authorized persons mobile phone)

II. PROPOSED METHOD

The circuit is mainly consisting of LPC2148 Microcontroller, GPS & GSM module, accelerometer sensor, flame sensor, flex sensor the explanation of this circuit component is as shown below.

Figure 1: Block Diagram

A. Microcontroller (LPC2148)

The NXP (founded by Philips) LPC2148 is an ARM7 based high-performance 32-bit RISC Microcontroller with 512KB on-chip Flash ROM with In-System Programming (ISP) and In-Application Programming (IAP), 32KB RAM, Vectored Interrupt Controller, Two 10bit ADCs with 14 channels, USB 2.0 Full Speed Device Controller, Two UARTs, one with full modem interface. Two 12C serial interfaces, Two SPI serial interfaces Two 32-bit timers, Watchdog Timer, PWM unit, Real Time Clock with optional battery backup, Brown out detect circuit General purpose I/O pins. CPU clock up to 60 MHz, On-
chip crystal oscillator and On-chip PLL. Due to their tiny size and low power consumption, LPC2148 are ideal for applications where miniaturization is a key requirement, such as access control and point-of-sale.

B. Flex sensor

The Flex Sensor patented technology is based on resistive carbon elements. As a variable printed resistor, the Flex Sensor achieves great form-factor on a thin flexible substrate. When the substrate is bent, the sensor produces a resistance output correlated to the bend radius—the smaller the radius, the higher the resistance value.

C. Accelerometer

An accelerometer is a sensing element that measures acceleration; acceleration is the rate of change of velocity with respect to time. It is a vector that has magnitude and direction. Accelerometers measure in units of g—a g is the acceleration measurement for gravity which is equal to 9.81 m/s². Accelerometers have developed from a simple water tube with an air bubble that showed the direction of the acceleration to an integrated circuit that can be placed on a circuit board. Accelerometers can measure: vibrations, shocks, tilt, impacts and motion of an object.

D. Flame Sensor

This module is sensitive to the flame and radiation. It also can detect ordinary light source in the range of of a wavelength 760nm-1100 nm. The detection distance is up to 100 cm. The Flame sensor can output digital or analog signal. It can be used as a flame alarm or in fire fighting robots.

E. LCD display:

A Liquid Crystal Display is a flat panel display, electronic visual display, or a video display that uses the light modulating properties of liquid. The purpose of using this LCD display in this prototype model is to display the information about the sensors that is its respective outputs. Here we are using 16*2 LCD display which is connected to port1 of microcontroller. The following are the basic commands used for LCD are shown in Table.1.

<table>
<thead>
<tr>
<th>S.NO</th>
<th>COMMANDS</th>
<th>FUNCTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>01H</td>
<td>Clear screen</td>
</tr>
<tr>
<td>2</td>
<td>38H</td>
<td>Select 5*7 matrix</td>
</tr>
<tr>
<td>3</td>
<td>0EH</td>
<td>Turn ON display, Turn ON Cursor</td>
</tr>
<tr>
<td>4</td>
<td>80H</td>
<td>Select Top row</td>
</tr>
<tr>
<td>5</td>
<td>C0H</td>
<td>Select bottom row</td>
</tr>
</tbody>
</table>

F. GPS and GSM module (SIM808):

SIM808 module is a GSM and GPS two-in-one function module. It is based on the latest GSM/GPS module SIM808 from SIMCOM, supports GSM/GPRS Quad-Band network and combines GPS technology for satellite navigation. It has high GPS receive sensitivity with 22 tracking and 66 acquisition receiver channels. Besides, it also supports A-GPS that available for indoor localization. The compact design which integrated GPRS and GPS in a SMT package will significantly save both time and costs for customers to develop GPS enabled applications. Featuring an industry-standard interface and GPS function, it allows variable assets to be tracked seamlessly at any location and anytime with signal coverage. The module is controlled by AT command via UART and supports 3.3V and 5V logical level.

III. PROJECT METHODOLOGY AND DISCUSSION

The objective of this project is to design a smuggling control system using LPC2148 Microcontroller and to integrate the hardware and software in such a way that a When any one tries to cut or try to harm tree it will be detected and is fed to the microcontroller then it is process and verified by the microcontroller to provide access to the vehicle and we can get the location of the vehicle by sending a SMS to the GSM module which will be with the forest authorized person. After sending the SMS to get the location the microcontroller will get the location from GPS module in terms of latitude and longitude and send it to forest authority.
Software Used:

1. **KEIL \( \mu \) Vision IDE:**
   KEIL \( \mu \) Vision is an IDE (Integrated Development Environment) which is used to develop an application program compile and run it even the code can be debugged. It is a simulator where we can check the application code even in the absence of the hardware board.

2. **Flash Magic:**
   Flash Magic is used for burning the developed code on KEIL in to the microcontroller Chip. The serial port of PC is connected to the port of microcontroller through MAX232 to burn the program into the microcontroller.

![Diagram](image)

**Schematic Diagram:**

**Figure. 6. schematic diagram**

**ALGORITHM:**
- Start
- Initialize
- Check sensors output, if Tree(T) is cut it gives signal to the microcontroller.
- If Tree(T) is not occur then it goes its original position there is no signal transformed
- After the Tree no.2 cut microcontroller output to GPS and GSM modem.
- Using GSM it indicates the movement of ‘tree (t)’ is cut to base station.
- The data of Tree(T) from GSM is transmitting by using GSM to base station.
- Stop

**Practical model:**

![Image](image)

**Figure.7. Lcd Displaying Welcome On Power**

**APPLICATIONS:**
1. This project can be used to provide high level security to our precious trees
2. Project will display basic information about the trees protection

**Advantage:**
1. Easy to use
2. Low cost
3. Easy to construct

**Disadvantages:**
1. It is a low range circuit and cannot be implemented in critical condition

**IV. CONCLUSION**

In this way we are developing the system which able to restrict the smuggling of tree in forest where the human being not able to provide security. Such system we are developing in the forest where the tree are costly and their protection is important fact. In this area we are provide such kind of system.

![Image](image)

**Figure. 8. SMS format in registered mobile**

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VI. BIOGRAPHY

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