ANTI-THEFT SYSTEM FOR LAPTOP TRACKING

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Abstract - Theft of electronic gadgets like laptops, mobile phones, etc. is an issue that has been affecting people all over the world for a long time. Losing a laptop is not only constrained to its cost. However it also includes loss of sensitive and personal information stored in it. Sometimes the precious data may fall into the wrong hands. The usage of a number of personal devices like smartphones, laptops are increasing day by day. The more we use our laptop, the more chances we lost it or misplaced. In proposed solution the methodology to track a stolen laptop through the implementation of GSM and Sensor. We present a unique way to protect the laptop from theft. Sensors are kept on sides of laptop, and if the stolen laptop is used by any individual other than the owner moment it makes a small movement and trigger an alarm will make noise. This alarm sound system is available in order to add more security. That will make the thief think twice before carrying the laptop with himself. Meanwhile the owner of laptop can monitor the current location of his or her stolen laptop through the smartphone by communicating with the GSM modules embedded in the laptop.

Key Words: GSM; GPS; laptop; Tracking; Vibration Sensor; Alert; Alarm; Drive; Mail; theft.

1. INTRODUCTION

In recent years, as man's dependence on electronic devices have greatly increased, so has the rate of their theft. It is estimated that smart phones are the ones that are being targeted the most, as they are usually small and quite convenient to be stolen in comparison to larger electronic gadgets. The major concern of any portable computing device like notebook, PDA, the laptop is the security. Because of having sensitive data and access to the internet the mobile devices move along with their owner, so the chance of being stolen or misplaced is increased. If the laptop misplaced or stolen the integrity and confidentiality of the data can also be lost. To retain the confidentiality and integrity of the data some authentication mechanism like password and pin code will apply. The tracking of the laptop is also important.

In recent years, many methods have been proposed for preventing the laptop thefts and to track back the misplaced laptop. Yet many of these measures have not been fruitful after deployment. Many of the previous methods depend on data mediums for communicating the information to the original user. Nowadays Laptop, smartphones, electronic gadgets which gets misplaced or stolen in a large number are subsequently not able to recover. Thus the main objective of the project is to provide high security measures to a displaced or stolen laptop by detecting it in offline mode and also preventing the extraction of data from the laptop.

Fig 1.0 Laptop model

Taking India as an example which has a population of 1.3 billion people, around 10 million of the population owns a laptop. In the present world, it's almost impossible to imagine that someone can live without computers or laptop. No matter what is the age, electronic device become everyday use for individuals and essential in almost all the business dealings that are made nowadays.

Every laptop is a storage to vital data and information which is very important to its owner and loss or theft of which can lead to serious loss for its owner. According to the National Crime Records Bureau, around 1.3 lakh laptops are stolen in every year and surprisingly the recovery rate Was as low 8%. It is the duty of the police officials or crime branch to handle such matters but they

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always have graver crime to focus upon. It's tough and tedious job for the officials to track the laptop.

2. BACKGROUND STUDY

Real-time tracking and management of laptop has been a field of interest for many researchers and a lot of research work has been done for tracking system. Recently the various anti-theft modules are introduced. The paper presented by Montaser N.Ramadan, Mohammad A. AlKhedher, Senior Member, IACSIT, and Sharaf A. Al-Kheder describes an efficient automotive security system for antitheft using an embedded system with a Global Positioning System (GPS) and a Global System of Mobile (GSM). The client interacts through this system with vehicles and discover their current locations and status using Google Earth. The user can track the position of targeted vehicles by Google Earth. Using GPS, the target vehicle's accurate location can be find out and sent, along with different parameters collected by vehicle's data port, via Short Message Service (SMS) using GSM networks to a GSM modem which will be connected to PC or laptop. This system is very safe and efficient to review and report emergency situations like crash reporting or engine failure. [2]

Pankaj Verma , J.S Bhatia Centre for Development of Advanced Computing, Mohali, Punjab, India describes GPS is one of the technologies that are used in a huge number of applications today. One of the applications is tracking vehicle and regularly monitoring them. This tracking system can determine the location and route travelled by the vehicle, and that information can be viewed from any other remote location. It includes the web application that gives you the exact location of target. This system can track target in any weather conditions. This system uses GPS and GSM technologies. Main aim is to design a system that can be easily installed and to provide platform for further enhancement. [4]

3. HARDWARE IMPLEMENTATION

The system is developed by integrating few sensors which will be connected to the laptop. Selection of hardware was difficult because there were few restrictions like power consumption, the size of hardware devices and overall cost of device. To receive and transfer data from sensors, processing and forwarding to GPS and GSM and other sensors the Arduino Nano is used in addition to this Arduino Nano will also activating anti-theft alarm module will be installed to trigger an alarm when theft tries to steal. The sensor stack includes a vibration sensor and GPS chip.

The vibration sensor uses piezoelectric effect while measuring the changes within acceleration, pressure and force.

Fig 1.1 Assembled Hardware

4. SOFTWARE SPECIFICATION

Software aspects of the product include integration of Arduino nano, sensor stack and mobile phone application. The data is exchanged between the mobile phone application and device fixed to the laptop. The data include latitude, longitude and some additional bits are forwarded from the device to the mobile phone application. This mobile phone application can remotely select lost option if he/she feels that their laptop's security has been compromised in any way or laptop has been stolen along with alarm. The user can also disable alarm if not needed. If the user has no active data connection then the device sends a sms to user phone number along with the latitude and longitude.

5. METHODOLOGY

The methodology is to track the laptop even if it is not connected to the internet or it is in off mode. The system which we are developing will track the location using GPS. GPS using GNSS (Global Navigation Satellite System) provides geolocation and time information to the GPS receiver. This GPS receiver sends the received information to GSM module which then sends to the owner. The owner will also be able to monitor the location of his or her stolen laptop through the mobile application installed on his or her phone by communicating with the GPS and GSM modules embedded in the laptop. Now if somebody conspires to steal the laptop, conspirer would definitely try to pick it up, the laptop makes the movement and thus the vibration sensor process and alarm trigger. When the vibration sensor sense the movement, notification is sent

to the owner's mobile application. Laptop is under threat, using the mobile application he can trigger the alarm module in the laptop, the alarm is loud enough. The owner of the laptop can keep a constant track of the location or ⬛ whereabouts of his laptop through the GPS chip embedded in the laptop.
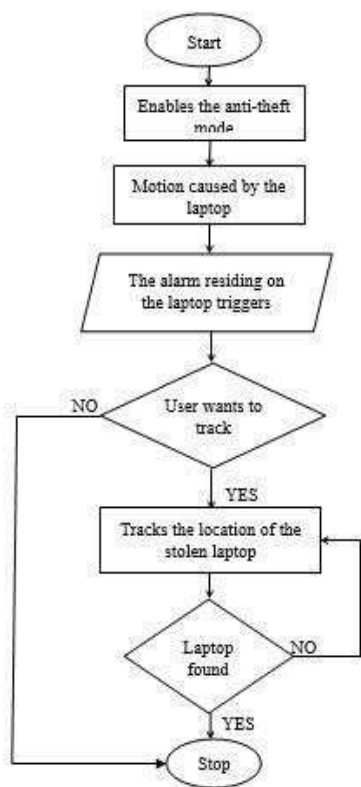

Fig 1.3 Flowchart

6. RESULTS

First user should login using registered Email-id and Password. Next it will redirect to the page with anti-theft mode switch. If that switch is on it will take to the main page which has 4 options n. Namely, Lost, Capture, Stop, Drive .

- LOST: if the user click on lost button it will send a message to the sim embedded in laptop and it will send back the longitude and latitude. Automatically app will read the message, and if we click on the link below will direct us to the Google map with that same longitude and latitude.

- CAPTURE: if the user click on capture button it will send a message to that number to capture the image of the person who tries to open the laptop (thief). if the laptop is on and has internet on, it will send the picture of the thief to the owner via mail.
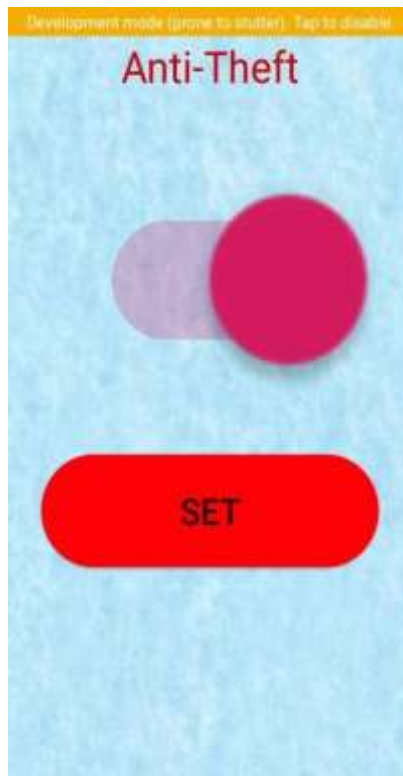
- DRIVE: if the user click on drive button it will send message to lock the drive.

STOP: for stopping the alarm.

Fig 1.4 Login Page

Fig 1.5 Registration Page

Fig 1.6 Anti-theft mode

Fig 1.7 Main Page

CONCLUSION

Laptops are always important to its owner. It contain many important information that user cannot effort to lose. The laptop tracking system that are available so far is less efficient because it can only track if it is switched on or connected to internet. The methodology using in this paper is more efficient since it can continuously track the laptop even if it is not switched on or connected to internet.

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