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Innocuous Watch

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Abstract—*This paper proposes a technique of GPS/GPRS module inbuilt in a watch. In everyday life women are unsafe to go out of their residence. In order to provide some safety measure, we have design a watch which will work as a GPS/GPRS locator, which will find the positioning of the person. The transmission of the signals take place by a GSM module and the image processed by the camera lens are being sent for the recipient. The functioning of the complete system will save a victim under any circumstances. The practical examination of the system is done by 4*4cm GPS/GPRS module and micro SIM slot at the back side of the watch, entire system works with common powered battery.*

Keywords*: safe watch, GPS/GPRS/GSM, camera, sms, transmitter, receiver.*

1. INTRODUCTION

As the population of the world has increased to an extreme level, recent survey on the crimes committed by human beings has also been increase. And India is also a country where the ratio of men are higher than women, due to this, cases like rape, molestation, minor case etc. will be found in some or the other places regularly in our daily life. So, as a protection measure in order to keep ourselves secure we have introduced a safe watch. This paper proposes a cost effective method of tracking a human's mobility using two technologies viz. General Packet Radio Service (GPRS) and Global System for Mobile Communication (GSM). The whole system allows the user's mobility to be tracked using a watch which is equipped with an internal GPS (Global positioning system) receiver and a GPRS transmitter. This safe watch has also got a front camera which will capture the image of the stranger. We have built the safe watch in such a way that after pressing a button, an automatic message will be send to the receiver part which can be a police station or guardian or any rescue team. Since we are using GPS/GPRS module we are going to use a micro SIM card in it for communication. A wide range of tracking systems has been developed so far for tracking vehicles and their position on a map, but none of the applications has been developed so far which tracks the mobility of a human being. Now a day's tracking a person's mobility has become a crucial issue. The organization of the paper is section II deals with the design methodology, section III system overview, section IV working principle, section V gives solution for low cost, section VI concludes the paper, section VII reference.

2. DESIGN METHODOLOGY

The "Waterfall" process model has been followed for the development of this project. The process is easy to understand by system developers as well as users, and this process model is more visible.

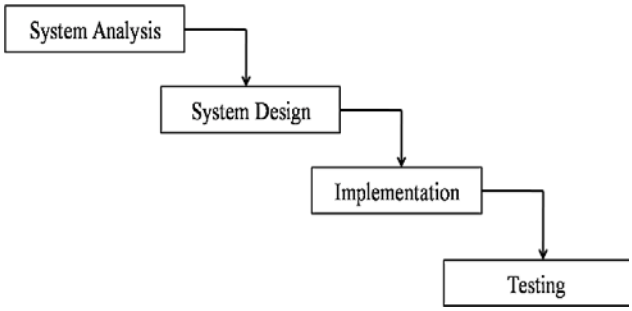

Fig. 1: Waterfall Model

1. System analysis

The system's service, constraints and goals are established by consultation with system users.

2. Design

The system design process partitions requirements to either hardware or software systems. It establishes overall system architecture. Hardware design involves circuit design, circuit building. Software design involves representing the software system functions in a form that may be transformed into one or more executable programs.

3. Implementation

During implementations, the software design is realized as a set of programs or program units and in the hardware implementation all the integrated units are interfaced to build a main system.

4. Testing

The individual interfacing units or programs are tested. Then they are integrated and tested as a complete system to ensure that the hardware and software requirements have been met.

3. SYSTEM OVERVIEW

The system has two parts – the tracking device and the database server as shown in Figure 1 below. The device is attached with the moving object and gets the position from GPS satellite in real-time. It then sends the position information with the International Mobile Equipment Identity (IMEI) number as its own identity to the server.

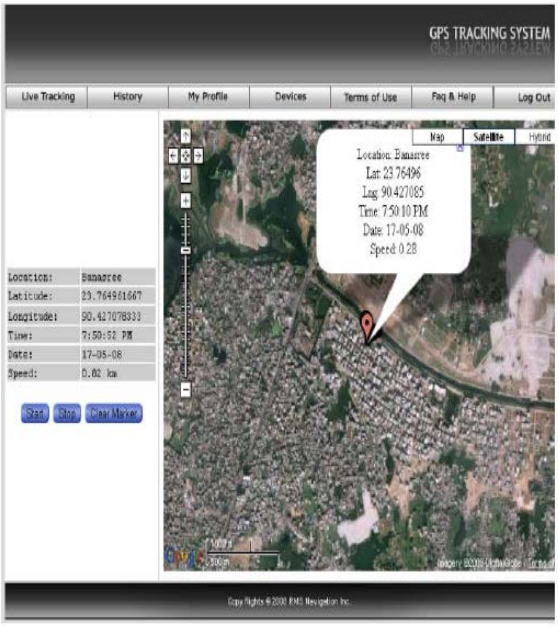

Fig. 2: Tracking Device and Database Server

4. WORKING PRINCIPLE

In this project work, a GPRS/GSM based monitoring gadgets is built & placed in every watches. These gadgets are programmable, which means it can be programmed to store the cell number of city police station, cell number of helpline supervisor, cell number of guardian etc. where information will be sent to the receiver. The receiver unit will receive the information from transmitting unit and displays the information on the display unit regarding the location of the problem facing person. The transmitter unit doesn't require display unit. Whereas receiver unit requires display unit for displaying the SMS received. Therefore the concerned authorities can takes necessary action.

Fig. 3: GPS/GPRS module.

GPRS/GPS range of modules enable us to remotely track & trace peoples, a variety of objects, e.g. cars, trucks, (motor) cycles etc. This project is targeted for personal use and any other application that need a minimum size, an extremely long battery life while maintaining the exact same options and server connection the full-size units have. The module provides reliable and accurate navigational data. All communication is handled effectively by a GPRS/GSM modem (QUAD band version) through GPRS or SMS. In areas without network coverage, position-data and events are stored in memory (up to 55,000 positions). As soon as communication is restored, all information can be transmitted.

Hardware Specification GPRS/GSM Module:

- Quad-band GSM for worldwide coverage
- Very small, only 46 x 21 x 6.5 mm.
- Serial, analog and digital interfaces
- 3 pushbuttons, 3 LEDs for user interaction
- Excellent GPS accuracy (onboard antenna), A-GPS options
- 2.4 GHz short range radio (+-30 mtrs) for special functions and peripherals. Optional onboard RF amplifier for over 1 km range (line of sight).
- On board sensors: 3D magnetic compass, 3D accelerometer up to 16g.
- Remote configurable to fit any job (both firmware and configuration files can be updated over the air)
- Configuration can be both Server and Event driven, 300+ different events, over 4000 geozones.
- runs local user scripts via .src files.

- Supports multi server configuration
- User definable SMS commands
- Audio with microphone and embedded class AB speaker amplifier
- Micro-sim and Sim-On-Chip options

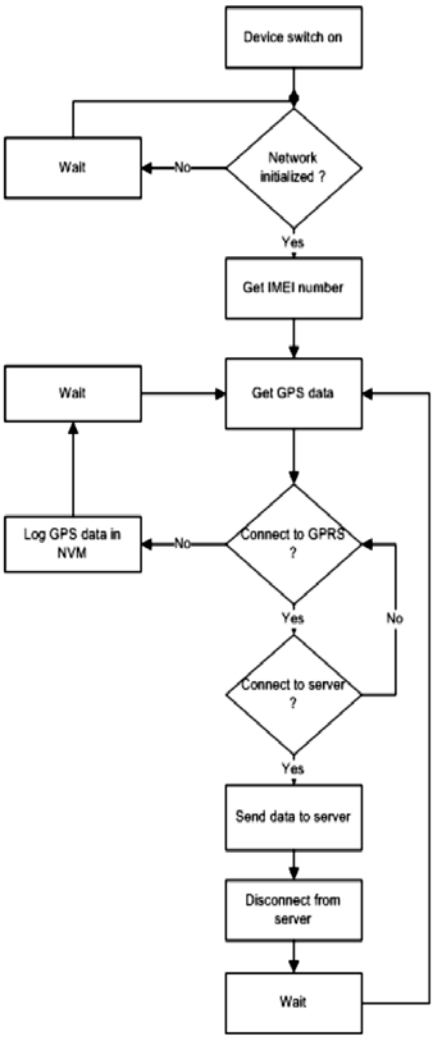

Fig. 4: Flow Diagram of the Process

Software specification:

To view the current position of the device a web-based application has been developed. Using this Web application an end user will be able to view the live position of the device and also the past position by selecting a specific date and time interval.

LCD display-The receiver unit requires display unit so as to display the message received based on the area location of the person seeking help.

Power Supply-Wide operating range: -40 ˚C … +85˚C (using Primary Lithium Cell). It also provides multiple watchdog levels for maximum stability. Dual charge protection for voltages and temperature range. Lightweight: 7 grams for the fully equipped PCB, 5 grams for a suitable 450mAh rechargeable battery. Ultra low power consumption, down to 3uA. Supply voltage is 3.2V - 4.6V .for power saving mode, typical power consumption in sleep mode is 1.3mA @ DRX=5 1.2mA @ DRX=9.

Frequency band- Frequency bands can be set by AT command. Quad-band GSM850, GSM900, DCS1800, PCS1900. Compliant with GSM Phase 2/2+.

Transmitter unit-A spy camera watch is an ideal device for capturing surveillance audio or video. They are also very easy to carry around; you just wear it like you do a normal watch without arousing suspicion. The wireless spy camera watch comes with a LCD screen. Additionally, we chose a spy camera watch that feels comfortable on our wrist. We Avoid models with a sci-fi look because it may draw the attention of the stranger towards the watch.So,We will go for a common design which nobody takes a second look at.

Fig. 5: Wrist Watch

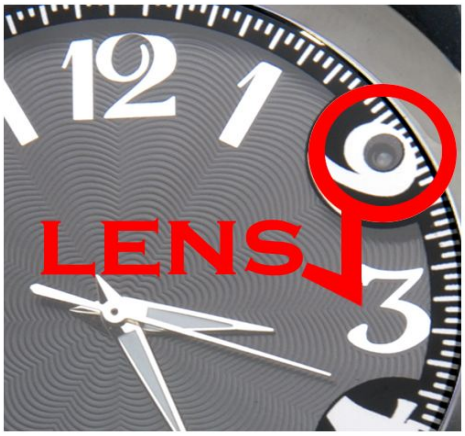

Fig. 6: Spy Camera

This spy camera is embedded with the GPS/GPRS module. The transmitter unit is design in such a way that the total module looks very small and inexpensive so that not only rich people can effort it but also normal middle class people would be able to purchase it, therefore we have not added any video player, music player etc. our main focus is to design a simple message sending electronic device for security of women.

Receiver unit:

It will have a GSM module, with which the message can be receive and display on the unit & can be a cell phone…..

Fig. 7: Received Detail in Cell Phone

5. SOLUTION TO LOW COST

Efforts have been taken to reduce the total cost of the system including device and services. The device cost is reduced by using a single module solution, that the device and service cost can be affordable to everyone including poor and middle class family. To reduce the total system cost, a single GSM/GPRS/GPS module is used instead of separate devices. Beside the cost, this approach saves extra PCB space of the system. This makes it easy to program, update and optimize the system and additionally save the external controller. Moreover, it saves development time and cost. Unlike mobile phone which has got multimedia functionality, these safe watch contains only location indicator, thus which give rise to heavy reduce in the cost of the entire system.

6. CONCLUSION

The advantage of this project is that the watch will be tied up in the hand, normally the attackers will try to snatch away the ladies hand bag or mobile phone which is very easy for them and even if we have chance of calling, messaging from a mobile phone normally takes time, while doing so the attackers would have approach to us much closer and snatch it away. But in this safe watch we just have to press a button to send the message which will just take a second along with the stranger's image. In future we can also implement it on ring, locket etc. so that more safety devices in different form will be available in the market in a fashionable form. Therefore it would be very difficult for those people to identify whether it is electronics device or not.

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