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Self Defense Module

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ABSTRACT

Self Defense module is like a Smart Watch For Women .It has the potential to help women with technologies that are embedded. It is specially designed for women safety. It has a control button that will be used by women to inform nearby police when they are in danger. This watch directly gets connected to the satellite through GPS when activated. Then the location is transferred through the GSM and it is also provided with a system that produces 60 shockwaves in 1 second in emergency situations.

Keywords: Ambient Intelligence, Smart Watch, Global Positioning system(GPS),Global System for mobile(GSM)

INTRODUCTION

Ambient Intelligence (AmI) is an emerging multidisciplinary area based on ubiquitous computing and that influences on the design of protocols, communications, systems, devices, etc. Ambient Intelligence proposes new ways of interaction between people and technology, making the latter to adapt to the users' needs and the environment that surrounds them. This kind of interaction is reached by means of technology that is embedded, non-invasive and transparent for users, whose main aim is facilitating their daily activities. Nonetheless, the development of AmI-based systems requires the creation of increasingly complex and flexible applications. In this sense, the use of context-aware technologies is an essential aspect in these developments to perceive stimuli from the context and react upon it autonomously. An environment capable of recognizing the presence of people, and locating them in a geographical and activity context is the base to Ambient Intelligence to demonstrate all its potential.

There are different approaches that propose electronic tele monitoring systems aimed at tracking victims and aggressors in order to reduce risk situations. Even though these approaches are based on locating and data transmission technologies such as GPS and GPRS

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Related work

In [1] authors discusses how to protect the location privacy from various privacy threats, which occurred because of the unlimited usage of LBS, by a scalable architecture. We have developed an efficient LBS privacy protection algorithm. In our model, k-anonymization and pseudo-anonymization methods are used hand in hand. In[2] Location based services (LBS) are one of the most commonly used services in Augmented Reality(AR).This paper discusses how to protect the location privacy from various privacy threats, which occurred because of the unlimited usage of LBS, by a scalable architecture. In [3] authors describes an approach for computational analysis of thematic blog data through a novel combine of sophisticated Information Retrieval and Language Processing Techniques. Our experimental data comprised of more than 600 blog posts on the broader theme of `Discrimination, Abuse and Sexual Crime against Women' collected during two discrete time periods. In sexual abuse case, the victim's body is the most important source of physical evidence. Forensic evidence in sexual assault will be collected because of intimate nature of this evidence and different special expertise are needed to conduct a detail examination. paper [4] present a preliminary study of this topic in order to gain a solution of decision making in child sexual abuse forensic field through intelligent decision support system. paper[5]aims to quantify the phenomenon of sexual harassment on campus, which based on the gender statistics from Taiwan's government, and use grey entropy model as the mathematics model to analyze the problem of sexual harassment on campus victims from year 2004 to year 2012 .In [6] author discussed about Increased concern about sexual harassment in the workplace, technical communication professionals in the arenas of training policies and procedures construct training programs that provide both male and female perspectives and prevent the slanting of materials inappropriately in one direction over another.

PROPOSED ALGORITHM

A.Design Considerations:

- Microcontroller ARM 7 LPC2148
- 16x2 LCD
- GPS Modem
- GSM Modem
- Relay, Shock generator
- ULN, APR, Speaker.
- Key, Emergency key, Voice kit

- Power supply, Mobile, TV, Computer police station

B.Description of the Proposed Algorithm:

Aim of the proposed algorithm is to help women by the technologies that are embedded in it. Smart Watch for Women is specially designed for women safety. when the supply is given the device will turn on.GPS and GSM connected to ARM also start working and it displays the current position of device. Then with the help of GPS the location (latitude and longitude) of the victim is detected and is displayed on the LCD.When the victim feels danger, he/she presses the first emergency key, the kit displays emergency situation and voice kit is enabled. Now the victim gives voice command and it is recognized by the kit. If the voice command matches with the one stored in database then the appropriate action takes place. For example if POLICE gets the voice command given by the victim, then a text message is sent to a number of police station and also an alarm is generated. Another emergency key is also provided in the kit and if it is pressed by the victim it generates a electric shock of around 12 V DC which can give severe shock to the person who is trying to mistreat

BLOCK DIAGRAM

The LPC2141/42/44/46/48 microcontrollers are based on a 16-bit/32-bit ARM7TDMI-S CPU with real-time emulation and embedded trace support, that combine microcontroller with embedded high speed flash memory ranging from 32 kB to 512 kB. A 128-bit wide memory interface and unique accelerator architecture enable 32-bit code execution at the maximum clock rate. The ARM7TDMI-S is a general purpose 32-bit microprocessor, which offers high performance and very low power consumption. The ARM architecture is based on Reduced Instruction Set Computer (RISC) principles, and the instruction set and related decode mechanism are much simpler than those of micro programmed Complex Instruction Set Computers (CISC). This simplicity results in a high instruction throughput and impressive real-time interrupt response from a small and cost-effective processor core.Voice Recognition Module.
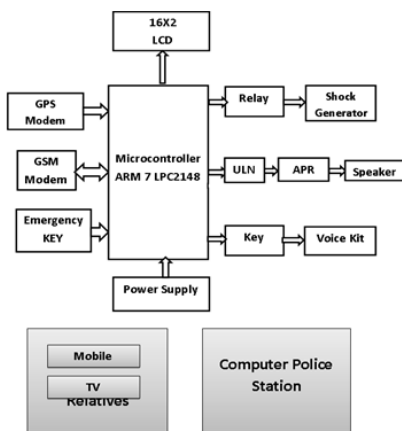

Fig 1. Block Diagram of Self Defense module

Voice Recognition Module V2 The module could recognize your voice. It receives configuration commands or responds through serial port interface. With this module, we can control the car or other electrical devices by voice. This module can store up to 15 pieces of voice instruction. Those 15 pieces are divided into 3 groups, with 5 in each group. First we should

train the module with voice instructions group by group. After that, we should import one group before it could recognize the 5 voice instructions within that group. If we need to implement instructions in other groups, we should import the group first. This module is speaker dependent. If you trained the module, your friend might not be able to make it work

Fig 2.Voice recognition module

POWER SUPPLY UNIT,The circuit needs two different voltages, +5V & +12V, to work. These dual voltages are supplied by this specially designed power supply.
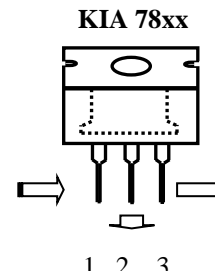

Fig 3.Power supply unit

GPS is global navigation satellite system which uses a constellation of between 24 and 32 Medium Earth Orbit satellites that transmit precise microwave signals that enable GPS receivers to determine their location, speed, direction,
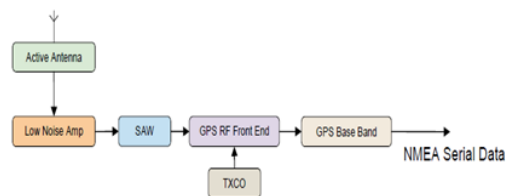

Fig 4.GPS block diagram

Fig 5.GPS receiver

Global System for Mobile (GSM) is a second generation cellular standard developed to cater voice services and data delivery using digital modulation One of the key features of GSM is the Subscriber Identity Module (SIM), commonly known as a SIM card. The SIM is a detachable smart card containing the user's subscription information and phonebook. This allows the user to retain his or her information after switching handsets. Alternatively, the user can also change

operators while retaining the handset simply by changing the SIM. A **16x2 LCD** means it can display 16 characters per line and there are 2 such lines. In this LCD each character is displayed in 5x7 pixel matrix. This LCD has two registers, namely, Command and Data.

SOFTWARE REQUIREMENT

The µVision3 IDE is a Windows-based software development platform that combines a robust editor, project manager, and makes facility. µVision3 integrates all tools including the C compiler, macro assembler, linker/locator, and HEX file generator. The µVision3 IDE offers numerous features and advantages that help you quickly and successfully develop embedded applications. They are easy to use and are guaranteed to help you achieve your design goals.

Embedded C. When designing software for a smaller embedded system with the 8051, it is very common place to develop the entire product using assembly code. With many projects, this is a feasible approach since the amount of code that must be generated is typically less than 8 kilobytes and is relatively simple in nature. If a hardware engineer is tasked with designing both the hardware and the software, he or she will frequently be tempted to write the software in assembly language.
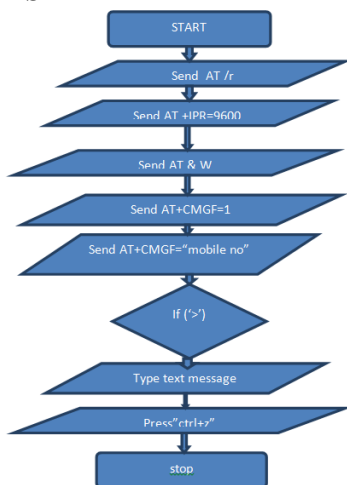
FLOW CHARTS

Fig 6. GSM Interfacing flow chart

This flow chart helps us to know how easily the interfacing of GSM is done and how the information is transferred to the particular mobile number. The next flow chart LCD interfacing helps to know how the particular location of the person is displayed in 16x2 LCD screen. The results are displayed in this LCD very clearly in step-by-step manner.
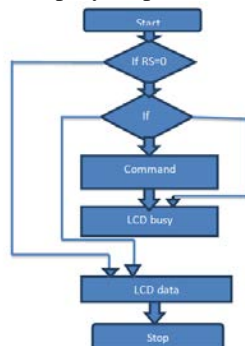

Fig 7.LCD Interfacing Flowchart

RESULTS

LCD DISPLAY :

Fig 8.Initial Location Identified

This diagram shows us the location of the particular person whom we want to track. This is done with the help of GPS and GSM

Fig 9.Emergency Switch Turned on

This diagram explains the emergency situation of the person whom we are tracking. The person has to press the switch in the smart watch. When the switch is pressed emergency information is send to nearby police station.

Fig 10.Voice Recognition Enabled

There is a second switch in this system. If the person turn on that switch voice recognition can be enabled. He/she can record their voice saying what type of help they need.
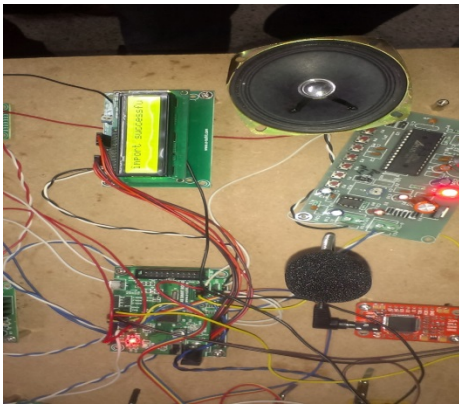
Fig 11.Input is fed successfully

Now the input data that is the voice of the person is stored. Then the data is transferred to the nearby police station. With the help of GPS and GSM the location of nearby police station is found out. The system is implemented with a Sim card. which also helps to transfer the information.
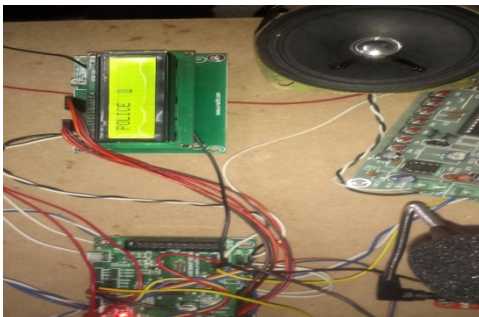

Fig 11. Information send to the police

When the information is transferred to police station or to their relatives they will come and save the particular person from danger.

CONCLUTION AND FUTURE WORK:

The Guardian system pursuits a revolutionary concept: the total supervision of people under risk situations, augmenting their safety and autonomy in a completely ubiquitous way. It is important to mention that there is no similar solution in the market. This fact implies a high level of hardware development. The creation of a hardware and software prototype has achieved two objectives: validation of the proposed architecture and checking whether the utilized technology is Appropriate for the system.

Future work includes the full development of all the projected functionalities. This includes the production of an extended and more integrated hardware prototype for the Wireless devices. In the future, the Sirius B device will communicate directly with an Android smart phone via the ADK interface, allowing two-way communication. At the software level, both the firmware embedded in the devices and middleware/software layers at the GIS will be completely developed, integrated and configured. Then, the system will be implemented in a simulated scenario to test if it is suitable for the situations for which it is designed. These situations include Domestic violence and children/elderly care situations. Finally, the system will be implemented in a real scenario in order to test its actual performance.

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