

Women Protection System Using 8051 Microcontroller

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Abstract—Women Protection System aims at helping women from any type of assaults. A Conductive Belt is used which will prevent any kind of attack from occurring. A mobile application is to be implemented that informs the predefined numbers about the safety and location of the user. This application is accessible automatically as well as manually. This belt basically works on the principle of a closed loop circuit. The microcontroller is used to achieve this purpose. The connectivity between the microcontroller and the mobile is maintained through the modem.

Keywords: Microcontroller 8051, Modem, J2ME

I. LITERATURE SURVEY

Since, ours is still a male-dominated society, women still continue to be exploited. Self defense and self protection are an important priority for women. The most common crime to happen to a woman is rape, but it is more about a feeling of dominance from one person over another rather than actual sex. According to statistics, the majority of rapes are perpetrated by men who women know. Assault on women is also a common crime because assailants assume women will be more passive and not fight back. The best way for women to fight back against crime is to prevent it from happening. Self defense is important because statistics say that all women are good candidates to become victims of violent crime at any point in their lives. According to statistics, a woman who is only 21 years of age has a 25 percent risk of suffering violent crime in her life. Self defense is more than just okay. For Self defense, various devices were employed which are as follows:

1. KUBOTANS: Kubotans are highly accessible, extremely durable, and very effective self defense weapons. They can be used for stabilizing your fist, applying pressure to sensitive parts of an assailant's body, swinging at, or gaining leverage on an assailant's wrist or fingers.

2. PEPPER SPRAY: Pepper spray, also known as OC spray (from "Oleoresin Capsicum"), OC gas, and capsi-cum spray, is a lachrymatory agent (a chemical compound that irritates the eyes to cause tears, pain, and temporary blindness) used in policing, riot control, crowd control, and personal self-defense. Pepper sprayers are available to the public in 5% and 10% concentrations. Pepper spray may not be effective in controlling an assailant if mis-aimed, or under windy

conditions. It also is known to be less effective on some persons than on others. Like any "device-based" self defense strategy, it's only useful if it's readily available the moment you need it.

3. LIGHTENING STRIKE DEVICE: The Lightning Strike® Personal Protection System is designed specifically to reduce the incidents of assaults, and overall violence against women. The system includes the only tactical flashlight specifically designed as a personal safety product for women, as well as a personal alarm that emits a 120 decibel shrieking alarm when activated. It comes with a neck lanyard, leather quick deployment holster, and tough coiled polymer light lanyard. But because of its small size it is tedious to locate it at that particular moment.

4. VTH U APPLICATION: With 2 clicks of the power button, anyone facing danger can send out an SOS message. The app sends a message to the contacts that one has provided as guardians saying "I m in danger, I need help. Please follow my location". The receiver also gets a link to user's location which is updated every 2 minutes.

II. INTRODUCTION

Pepper sprays, taser guns, stun guns, knuckles, etc, all some weapons used for self defense. They prove to be a failure because of a major negative point. These weapons can protect as long as they are in the correct hands. As mobile phones have gelled pretty well in our life style, it's now time to arm mobile phones for personal safety. We are sharing a concept that may help women to tackle such brutal crime.

PROPOSED SYSTEM:

Women Protection Belt is a device which uses modern technologies of communication. The safety of women is just a touch of key away. The moment she presses the key her location will be traced and an alert message with the location will be sent to the predefined numbers. In case she is unable to press the key and is unconscious due to any unaware reason, on opening the belt the same process will be carried out.

DEVICES USED:

1. MICROCONTROLLER 8051:

The Intel MCS-51 (commonly referred to as 8051) is a Harvard architecture, CISC instruction set, single chip microcontroller (μ C) series [1].

The 8051 architecture provides many functions (CPU, RAM, ROM, I/O, interrupt logic, timer, etc.) in a single package

- 8-bit ALU and Accumulator, 8-bit Registers (one 16-bit register with special move instructions), 8-bit data bus and 2x16-bit address bus/program counter/data pointer and related 8/11/16-bit operations; hence it is mainly an 8-bit microcontroller
- Boolean processor with 17 instructions, 1-bit accumulator, 32 registers (4 bit addressable 8-bit) and up to 144 special 1-bit addressable RAM variables (18 bit addressable 8-bit)
- Multiply, divide and compare instructions
- 4 fast switchable register banks with 8 registers each (memory mapped)
- Fast interrupt with optional register bank switching
- Interrupts and threads with selectable priority
- Dual 16-bit address bus – It can access 2×2^{16} memory locations – 64 KB (65536 locations) each of RAM and ROM
- 128 bytes of on-chip RAM (IRAM)
- 4 KB of on-chip ROM, with a 16-bit (64 KB) address space (PMEM). Not included on 803X variants
- Four 8-bit bi-directional input/output port
- UART (serial port)
- Two 16-bit Counter/timers
- Power saving mode [2].

2. MODEM:

A modem (modulator-demodulator) is a device that modulates an analog carrier signal to encode digital information, and also demodulates such a carrier signal to decode the transmitted information. The goal is to produce a signal that can be transmitted easily and decoded to reproduce the original digital data. Modems can be used with any means of transmitting analog signals, from light emitting diodes to radio. The most familiar example is a voice band modem that turns the digital data of a personal computer into modulated electrical signals in the voice frequency range of a telephone channel. These signals can be transmitted over telephone lines and demodulated by another modem at the receiver side to recover the digital data [3].

3. J2ME:

Java Platform, Micro Edition, or Java ME, is a Java platform designed for embedded systems (mobile devices are one kind of such systems). Target devices range from industrial controls to mobile phones (especially feature phones) and set-top boxes. Java ME was formerly known as Java 2 Platform, Micro Edition (J2ME).

Java ME devices implement a profile. The most common of these are the Mobile Information Device Profile aimed at mobile devices, such as cell phones, and the Personal Profile aimed at consumer products and embedded devices like set-top boxes and PDAs. Profiles are subsets of configurations, of which there are currently two: the Connected Limited Device Configuration (CLDC) and the Connected Device Configuration (CDC) [5].

The Connected Limited Device Configuration (CLDC) contains a strict subset of the Java-class libraries, and is the minimum amount needed for a Java virtual machine to operate. CLDC is basically used for classifying myriad devices into a fixed configuration.

A configuration provides the most basic set of libraries and virtual-machine features that must be present in each implementation of a J2ME environment. When coupled with one or more profiles, the Connected Limited Device Configuration gives developers a solid Java platform for creating applications for consumer and embedded devices. The configuration is designed for devices with 160KB to 512KB total memory, which has a minimum of 160KB of ROM and 32KB of RAM available for the Java platform.

Designed for mobile phones, the Mobile Information Device Profile includes a GUI, and a data storage API, and MIDP 2.0 includes a basic 2D gaming API. Applications written for this profile are called MIDlets. Almost all new cell phones come with a MIDP implementation, and it is now the de facto standard for downloadable cell phone games. However, many cell phones can run only those MIDlets that have been approved by the carrier [6].

Various Conditions:

1. In normal condition, if a user wants to open the belt on its own, then she can deactivate the entire system by entering the password on the mobile.

2. If the user senses any type of emergency situation (When user is able to sense the danger-any type, with her consciousness); she can press the emergency key on the belt side hardware which will send a signal to the mobile and mobile will fetch the current GPS location and will send these information to the predefined numbers using SMS method.

3. In case of sudden attack:

There are two possibilities:

1. The mobile is with the person (in the bag or pocket).
2. The mobile is thrown away OR the purse is left behind in which was kept OR any other possibilities.

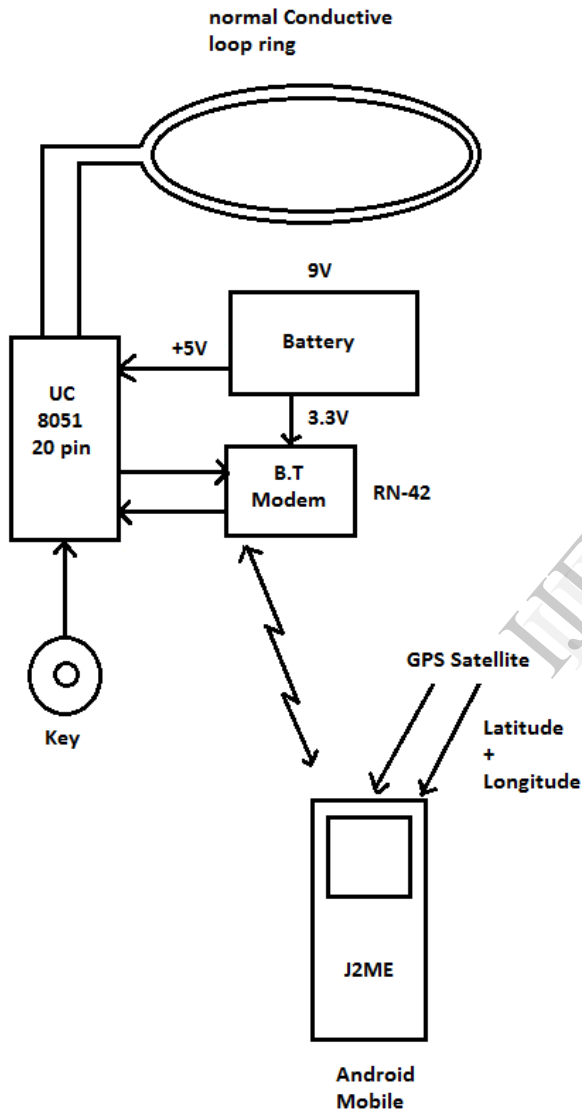


Fig. 1. The system block diagram.

Response of the System:

Case 1:

- a. If the user is able to press emergency key, then step (2) will be executed.
- b. If the user is not able to press the key; and if the belt is forcefully opened OR it got torn in the struggle then automatically the (Hardware-Microcontroller) will generate alert command to the mobile and it will send the GPS location and alert SMS to family.

Case 2:

The link between the mobile and the hardware will get disconnected then the mobile will automatically send the GPS location (the last recorded) and alert SMS to the family (predefined numbers).

4. In case of unconsciousness (due to some drug):

The belt of the system will be the main functioning part in this mode. Again it may be torn or opened by the culprit. The system will execute the same procedure as in step b in Case (1).

III. ADVANTAGES

1. It is easy to design and manufacture as all the components are easily available.
2. It is highly accurate and precise and also very reliable.
3. The use of a micro-controller increases its scope of applications and modifications.
4. It has low cost of manufacturing.
5. The μ C can be reprogrammed if any modification is required.
6. Due to wireless communication data rate is faster .
7. Wireless makes ease of operation.
8. Power consumption is less.
9. Easy to wear on any sort of clothing.
10. Dedicated emergency service codes can be used as predefined numbers if the mobile is out of range.

IV. DISADVANTAGE

1. If the battery drains, the system won't work.
2. Failure of components may lead to dire consequences.
3. The mobile application needs to be upgraded according to the user's need.

V. FUTURE ASPECTS

1. The efficiency of this system can be increased or in fact improved by making the belt water proof.
2. A buzzer alarm can also be included in this device which plays on pressing the key.
3. A voice processor can be employed. The voice of the victim will be transmitted as a voice message to the predefined numbers.
4. To increase the security more intensely a shock system can also be added, which gives a shock to the attacker if he tries to open the belt forcefully.

VI. CONCLUSION

Till date, technology was used for the ease of humans. But being the need of the hour, now its time for using it for the sake of safety even. The idea of protection belt is just an example of that. The Women Protection Belt is a perfect device which will prevent her from becoming a victim of any kind of assault.

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