International Journal of Science and Research (IJSR)
ISSN: 2319-7064
ResearchGate Impact Factor (2018): 0.28 | SJIF (2018): 7.426

ARMOUR: Women Safety Mechanism

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Abstract: ***The thought haunting every girl as she takes a step out is when they will be able to move freely on the streets without worrying about their security. In time of crisis female body does not quickly respond suitably and thus as an effort to fight back, a defence system is of prime importance. Thus, the idea of ARMOUR came up. In the light of the existing women protection systems, the intention is to put forward something unique and comparatively more reliable. ARMOUR will be a standalone, compact wearable device which will ensure help to a woman, whose device has been triggered either voluntarily or conditionally and a resultant signal has reached the required destination. The presence of the said device will be known to the user only. The unique feature of this device is the undressing loop, added by considering the condition of a physical assault and the unconscious state of human body.***

Keywords: GSM, GPS, Wearable sensors, Undressing Module, Lead acid Rechargeable Battery

1. Introduction

We live in a world where rapists and attackers can easily get away with life imprisonment for a crime that is worthy of capital punishment. This is the sole reason for the increasing rate of attacks against women and children. Women feel unsafe to step out at late hours or to go to secluded places because of the present scenario. Along with establishing solid laws to properly punish these culprits, we also need to train our women and children to stand up for themselves under any of these circumstances. In most cases, the victim will be incapable of getting any help during these incidents as the communication facilities like mobile phones will be the first thing that the attacker will abduct. Thus we need an external device which ensures that help will reach the victim under these circumstances along with a defence mechanism. '**ARMOUR'** is such a device which ensures help reaching a woman from police or related defense systems, when triggered either voluntarily or from involuntary reactions caused due to an assault. It is powered by lead acid rechargeable battery. GSM and GPS are the communication systems used in the device. Considering the present day scenario such a device is of key importance.

2. Block Diagram and Working

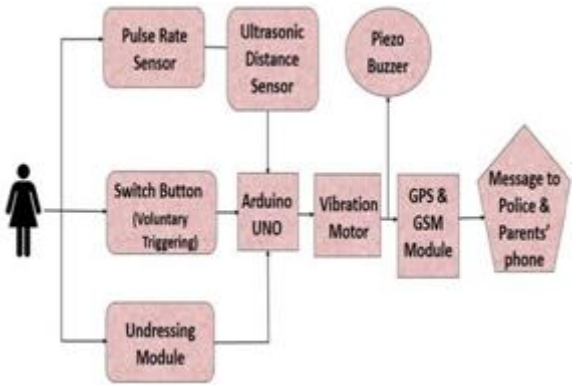

Figure 1: Block Diagram of ARMOUR

Figure 1 shows the block diagram of ARMOUR. Working of the device can be explained as follows:

1) **Voluntary Triggering**: If the user senses some danger, the device can be triggered voluntarily by pressing the manual triggering switch provided on the shoulder of the vest.
2) **Involuntary Triggering**: The device gets triggered involuntarily if the following two conditions are satisfied simultaneously. That is, when the pulse rate of the user exceeds the preset threshold value and also the attacker is within the preset proximity limits.
3) **Physical Assault**: The third condition is the sensing of undressing during the unconscious state or physical attack on the user. An undressing loop is formed by short circuiting two conducting wires around the shoulder portion of the vest. Therefore, a continuous current flows between the wires and when the dress is pulled apart, the undressing loop breaks. This is sensed by the device and it gets triggered automatically.

In all the three cases mentioned above, when the device is activated a vibration will be provided to the user as an indication that the message is about to be send and if it is a false triggering the user can reset the device by pressing the reset button. If not, after a particular delay of few seconds an alert message along with the user's location will be send to the destination (police & to the preset numbers). At the time of sending the alert message, the piezo buzzer gets turned on and it produces a high shrill sound. It acts as a defense mechanism to panic the attacker and as an alarm to alert the neighbours.

3. Result

After integrating the hardware and software, the project model was tested and debugged. When the device is turned ON all the components get activated which is denoted by LED indications. The vest is designed to operate in three conditions. Such as:

1) Manual condition
2) Conscious state of human body
3) Unconscious state of human body

Manual Condition

When the user feels unsafe, she can voluntarily activate the device by simply pressing the button. Once the button is

pressed, after a particular delay the buzzer gets activated and at the same time an alert message will be send to the destination.

Conscious State of Human Body

When the user is attacked and if she is unable to manually press the button, the device automatically sends an alert message. Once the device is turned ON, it starts sensing the body parameters of the user. If the pulse rate sensed is above the preset threshold value and if the intruder is within the proximity limits, as sensed by the ultrasonic distance sensor, the device sends an alert message to the destination after giving an indication to the user.

Unconscious State of Human Body

When the user is attacked and/or falls into an unconcious state, and the attacker tries to undress the person, the device has to operate. For this, an undressing short circuit is connected along with the press buttons on the shoulder. When the attacker pulls out the dress, the circuit breaks and the device gets triggered. Thus, the device sends an alert message to the destination after a delay.

In all these three conditions, the device sends an alert message to the destination as given prior to the device. The message also provides the location details of the user to the destination as soon as possible. It includes the latitude and longitude position of the location.This is shown in figure 2.

Figure 2: Alert Message is Sent to the Destination along with the Location Details

4. Conclusion

ARMOUR can perform the real time monitoring of desired data at low cost and minimum power consumption. This defence mechanism helps in identifying possible threat or attack and contacting the resource persons or established security systems to help the victim out of unsafe situations. Considering situations of victim falling into unconscious state, the undressing module was added. It is designed as a garment that is easy to wear and handle. The Garment design idea has aided in distributing the components making the hardware design less bulky. By incorporating advanced technologies and with required capital, this project can be elevated to the next level.

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