

DESIGN AND IMPLEMENTATION OF SMART SLIPPERS FOR WOMEN SAFETY

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Abstract - Today, in this modern world, women are facing lot of challenges which affect their mental health and thus the security and safety of women is the need of the hour. Here, in this project, a device which integrates a shock circuit in a slipper is proposed for the safety of women. With the help of this proposed model, a woman can paralyze an attacker with the help of the shock produced from the metal pins present in the proposed slipper design. This would help a woman to escape from the attacker and reach a safer place. The design could be devised using a 555 timer IC, a MOSFET, a 1N4007 Diode, a 12V Transformer, few capacitors and resistor, GPS and GSM module and a 9V battery. The design has a "Push" button which when triggered, the device will get activated and in turn the metal pins will produce an electric shock of few Kilo Volts. This electric shock when comes in contact with the body of any attacker will paralyze the attacker and the information about her emergency and location is sent as SMS and so, a woman could safeguard herself from any attacker.

Key Words: Electric shock, GPS module, GSM module, Push button, Node MCU, 555 Timer.

1. INTRODUCTION

In India, the cases of harassment and molestation are very high. Similarly, unlike the olden days, women have started getting educated and employed. Women empowerment is taking a fast pace and the awareness that women have is increasing rapidly. Women in IT sectors work in shifts and return back late to home. Even though they are confident enough about their security, some unfortunate events are still taking place across the country. To boost their confidence level and provide security to them, there are lots of smart phone applications for them to report their dangerous situation to their friends, family members or Police. This project proposes the idea of simple and a handy day to day usage device as the safety device. It makes use of GPS module, GSM module, a shock circuit and a push button, in which all these are integrated with a microcontroller.

2. RELATED WORKS

1. **VithU app** : This is a smart phone emergency application which was initiated by Indian Crime Television series "Gumrah". When the power button of the mobile is pressed two times, a SMS is sent to the predefined contacts, stating the emergency situation of the user. Also, there is a "Scream"

feature in the app which makes some sound when the user is in danger. The location of the user is sent to the predefined contacts as SMS.

2. **SHE (Society Harnessing Equipment)**: This garment has an electrical circle that may generate 3800kV of current which may facilitate the victim to flight and the attacker to paralyze designed by three engineers from Chennai. Just in case of multiple fireplaces it will send up to eighty-two electrical shocks to the attacker. Since the material is bi-layer, the user isn't affected. It can even send emergency messages.

3. **Suraksha** is a stand-alone device which can be triggered in three ways either voice, switch, and shock/ force. Voice is the voice of victim. The device will recognize it and automatically send messages. Switch is a simple on/off trigger, and shock/force- whenever this device is thrown it will use force sensor to start functioning by giving the information of the location of the victim to her members of family and friends.

4. **The device (FEMME)** proposed by the authors has an android application. Its basic functionality is to send an SMS or message, record audio and video of the whole incident as evidence. It also has a module which detects hidden cameras using a RF receiver, which collects or detects electromagnetic waves that are emitted from the spy camera.

3. PROPOSED METHODOLOGY

This paper proposes a simple and handy device for women to protect themselves from harassments. It focuses on boosting the confidence and security of women. In this device a GPS module, a GSM module and a short circuit is integrated with the microcontroller. The microcontroller used here is node MCU. A push button is present in the side of the slipper. When this push button is pressed the shock circuit is triggered and the metal probes produces shock. The GPS module senses the location and through the GSM module, the location is being sent to the default mobile number given in the program as an SMS. Also, there is an alert buzzer which is activated when the push button is pressed so that the women can save herself from the attacker. This shock circuit produces around 1000V or 1 KV of shock, when the push button is triggered. This will help the victim to move to a safer place by paralyzing the attacker. The block diagram of this device is shown in Fig 1.

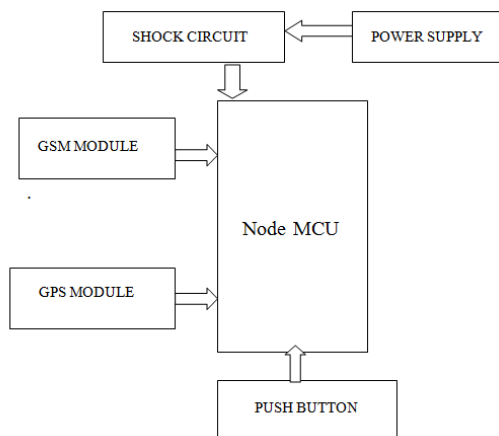


Fig 1 : Block Diagram

4. HARDWARE DESCRIPTION

The microcontroller used for this device is Node MCU. The shock circuit is constructed using Step-up transformer, Relay module and few capacitors. The GPS module is neo 6m and GSM module is SIM 800. A basic push button is used to trigger the device.

4.1 GSM Module

Here, GSM SIM800A is used. GSM is expanded as Global System for Mobile which is a chip or circuit that will be used to establish communication between a mobile device or a computing machine and a GSM. It delivers messages to the pre-stored numbers in case of an emergency and thus alerts the contacts.



Fig 2: GSM Module – SIM800a

4.2 GPS Module

GPS (Global Positioning System) is a space-based satellite navigation system. It provides location and time information in all weather conditions, anywhere on or near the Earth. We have used Neo6m module for this device. There are four satellites to calculate the dimensions, X,Y and Z. GPS receiver converts the received signals into position.



Fig 3: GPS Module – Neo6m

4.4 Microcontroller – Node MCU

The controller used for this device is Node MCU. Node MCU is an open-source firmware developed for the ESP8266 Wi-Fi chip. By exploring functionality with the ESP8266 chip, Node MCU firmware comes with the ESP8266 Development board/kit. Since Node MCU is an open-source platform, its hardware design is open for edit, modify, etc.



Fig 4 : Node MCU

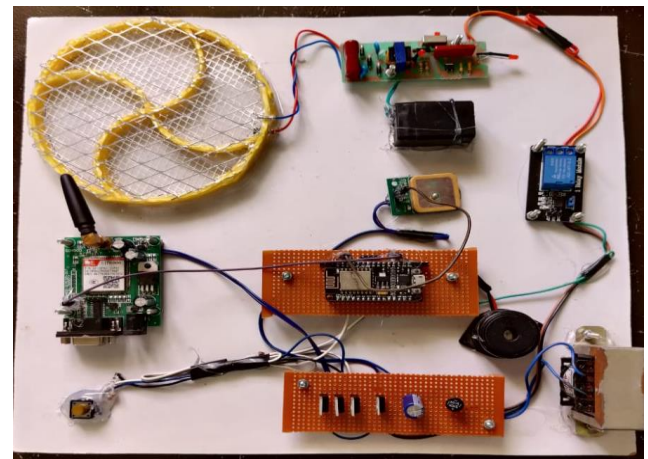


Fig 5 : Hardware Model of the device

5. RESULTS

When in an emergency situation, if the push button is pressed, then the buzzer gets activated and starts making sound. The shock circuit is triggered and the metal probes or the mesh starts producing high voltage shocks of about 1KV for few moments. Simultaneously, the GPS senses the exact location of the victim and an SMS is sent to the pre-defined mobile numbers with latitude and longitude details.



Fig 6 : Messages from the device

6. CONCLUSION

Thus, with this device women can feel safe and secure when they are outside their homes at any time of the day, be it early morning or at the night. Women can feel confident that she has a weapon to safeguard herself from harassment; in turn more women come out of their homes to build their career. A camera can be integrated with this device, so that all the happenings are captured and it will be easy for the Police to save the woman and find out the attacker. Also, piezoelectric sensors can be placed in the bottom surface of the slippers, which provides the battery with power that triggers the shock circuit.

ACKNOWLEDGEMENT

Behind every achievement lies an unfathomable sea of gratitude to those who actuated it, without them it would never have been into existence. To them, we lay the word of gratitude imprinted within us.

We would like to express our gratitude to the SNR Sons Charitable Trust and the Principal Dr. M. Paulraj for giving us access to all the necessary technological resources.

We express our gratitude to Dr. H. Mangalam, Head of the Department, Department of Electronics and Communication Engineering for her conscientious guidance and encouragement.

We would like to express our heartfelt thanks to our Project Coordinator, Dr. D. Binu, Assistant Professor (Sl. Gr.), for her constant support and motivation.

We would like to extend our sincere gratitude to our Project Supervisor, Ms. A. K. Kavitha, Assistant professor (Sr. Gr), Department of Electronics and Communication Engineering for her cordial support and guidance.

We sincerely thank all the teaching and non-teaching staff of Electronics and Communication Engineering department for all what they have been for their enquiry about the project.

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