

## TOUCH ME NOT-A Women Safety Device

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**Abstract** - : Women security is a major issue of concern in today's world. Women are subjected to unethical physical harassment. Women safety methods such as various mobile apps have been tried and implemented, but the need of the time is that they need is a device that can be carried everywhere easily. Here we present Touch Me Not, an idea to design one such device which can be attached to the clothing. It will be a button which will be attachable to the clothing. This button will be connected to the system which has two modules, one which can be used when someone makes some sort of unethical movement and the other one which can be used when you sense danger. The first module can be used just to record that is making a short video to capture the assailant, while the second one can be used during times of danger to send your location to family or friends as well as it alerts the nearest police station, such that help can reach as soon as possible. The tools that we will be using include micro-controllers, GSM and GPS modules for the hardware section, python for the software section.

**Key Words:** Arduino programming, GSM module, GPS Module, SD Module

### 1. INTRODUCTION

The purpose of this project is to design an easy and portable device for women safety. Here we are mainly focusing on designing a prototype in which the device can be easily carried around. Women security is a major issue of concern in today's world. Women are subjected to unethical physical harassment. Women safety methods such as various mobile apps have been tried and implemented, but the need of the time is that they need is a device that can be carried everywhere easily. *Touch Me Not*, an idea to design one such device which can be attached to the clothing. It will be a button which will be attachable to the clothing. This button will be connected to the system which has two modules, one which can be used when someone makes some sort of unethical movement and the other one which can be used when you sense danger. The first module can be used just to record that is making a short video to capture the assailant, while the second one can be used during times of danger to send your location to family or friends as well as it alerts then nearest police station, such that help can reach as soon as possible.

The idea to develop a smart device for women is that it's completely comfortable and easy to use as compared with already existing women security solutions such as a separate garment, bulky belts and in famous mobile apps that are just very abstract and obsolete. If a woman is subjected to attack

by an adversary, then a switch has to be pressed by her, manually, (which will be ideally located at a convenient location on the body), which in turn will trigger the micro-controller to activate the on body GPS Tracker and simultaneously capture the image/video of the attacker, and transmit it via an RF module to another section where it will be stored. Here we are attempting to make to develop a method by which this image can be transferred on a web server, ideally on the police server. Next, the Global Positioning System (GPS) receiver will acquire the location co-ordinates of the woman subjected to attack, and will send these to the pre-decided cell phone numbers (typically the family and the police), via GSM module.

### 1.1 Existing System

Having the concern of women in mind many developers have come up are: Codes like \*91# is used to provide emergency services, which will alert police control. Free mobile application 'Help me on mobile' to ensure safety of women was launched to assist those who need emergency. These applications need a single click to do this task. But when a girl is in trouble, there can be times that the girl is not capable of taking the phone and pressing button.

**SHE (Society Harnessing Equipment):** It is a garment embedded with an electronic device which gives out 3800kV electric shock to the assailants helping the victim to escape. **Smart Belt:** This system is designed with a portable device which resembles a normal belt. It consists of Arduino board, screaming alarm and pressure sensors.

**Watch Over Me** an application which turns phone into a personal safety device. It monitors the journey and alerts the contacts if the user has not reached the destination within scheduled time. In the instance of attack the user has to shake the phone to trigger alarm.

**Witness:** Using Witness, users can broadcast their location, audio, and video to loved ones in just one touch. It will call and text emergency contacts as well as broadcast live video, audio, and your location. iOS. The above mentioned are just a few examples of safety and security devices implemented.

### 1.2 Proposed System

**Touch Me Not** is a security device in a button form. The button which can be attached to the clothing and when pressed it performs the action of alerting contacts including the selected family member or friend as well as the police. The device enabled with the GPS system will be able to send

the location to the contacts. The device will be enabled with camera which will capture images and videos based on the users trigger and these images will also be sent to the contacts. The figures below show block diagram representation of the system to be implemented.

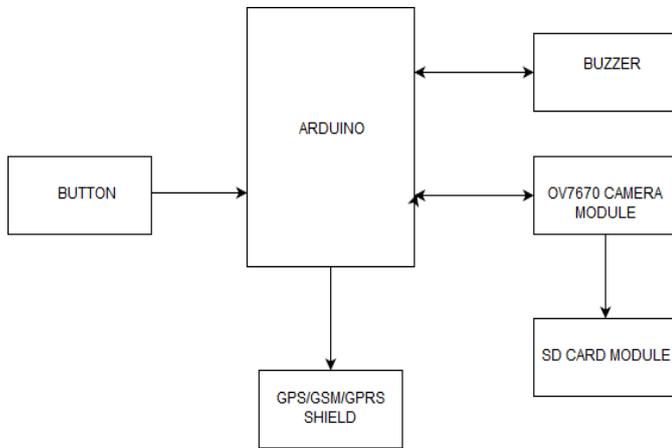


Figure1: Design of the System

Here the figure 1.2.1 represents the block diagram of location tracking module. Here the trigger will be button press which will activate the GSM module to send the location which is tracked by GPS to the selected phone numbers.

The following steps briefly define the working of the device as shown in the figure 3.2:

1. The system is turned ON when switch is pressed in instances of attack, manually by the woman.
2. This switch triggers a microcontroller that activates an on-body alarm.
3. The microcontroller triggers the on-body camera and GPS module to capture the image and get the location respectively.
4. Images are stored in a micro SD card as a proof for legal actions.
5. Hand-held controller when triggered, receives location coordinates from the GPS receiver and transmits these in the form of an SMS to the pre- decided phone number.

## 2. DESIGN AND DEVELOPMENT

### MODULE DESIGN

This system functions with 4 different modules. They are

1. GPRS MODULE (Location Tracking Module)
2. Image capturing and storing
3. GSM Module (Sending module)
4. Alarm

### 2.1 GSM and GPRS Module

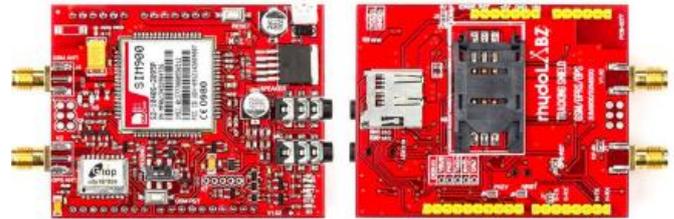


Figure2: GSM/GPS/GPRS Module



Figure3: Camera OV7670

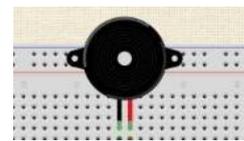


Figure4: Alarm Module

### MODULE DESCRIPTION

The system we have presented here has mainly four parts. They are

1. Location Tracking (GPS module)
2. Image capturing and storing
3. Storing and sending (GSM module)
4. Alarm

The first step is location tracking. The location tracking system is an important part of this project since it makes sure that help is on the way for the victim. Hence, it is required to be faster and efficient. Location tracking intends to update the location of the victim continuously to either the police or the family of the victim. The programming is such that the latitude and longitude of the victim is reported at multiple instances and at different times. The most convenient form to inform about location is a Short Message Service (SMS) as cell phones are widely used. The location tracking subsystem starts working on the trigger by the user. On parsing the correct reading, the micro-controller commands the Global System for Mobile (GSM) module to transmit the data through an SMS by using AT commands. A GSM digitizes and reduces the data, then sends it down through a channel with two different streams of client data, each in its own particular time slot. The digital system has an ability to carry 64 k bps to 120 Mbps of data rates.

Image is acquired from a high definition button-spy camera that is of button size attached to cloth. It captures images at trigger i.e. button press by the user. These captured image are then store to SD card and saved for future use. The alarm module is secondary module which will be triggered with two button press. Initially at the first trigger only the location will be sent. If the user feels threatened or needs emergency assistance, then all that has to be done is simply activate this alarm. It will catch the attention of others for immediate help. The alarm will sound for three minutes and then cease. Especially useful for women while traveling alone as it is small enough to pocket or carry in a hand bag.

## 2.1. HARDWARE SPECIFICATIONS

The components used for this system are:

### (A) Arduino

Arduino is an open source computer hardware and software company, project, and user community that designs and manufactures single-board microcontrollers and microcontroller kits for building digital devices and interactive objects that can sense and control objects in the physical world. The project's products are distributed as open-source hardware and software, which are licensed under the GNU Lesser General Public License (LGPL) or the GNU General Public License (GPL), permitting the manufacture of Arduino boards and software distribution by anyone. Arduino boards are available commercially in preassembled form, or as do-it-yourself (DIY) kits.

Arduino board designs use a variety of microprocessors and controllers. The boards are equipped with sets of digital and analogue input/output (I/O) pins that may be interfaced to various expansion boards (shields) and other circuits. The boards feature serial communications interfaces, including Universal Serial Bus (USB) on some models, which are also used for loading programs from personal computers. The microcontrollers are typically programmed using a dialect of features from the programming languages C and C++. In addition to using traditional compiler toolchains, the Arduino (IDE) based on the Processing language project.

### (B) SIM908 GPS & GSM/GPRS Quad Band Serial Modem

SIM908 module is a complete Quad-Band GSM/GPRS module which combines GPS technology for satellite navigation. The compact design which integrated GPRS and GPS in a SMT package will significantly save both time and costs. Featuring an industry-standard interface and GPS function, it allows variable assets to be tracked seamlessly at any location and anytime with signal coverage. It includes GSM Antenna and GPS Antenna. Features: Dual SMA Antenna Connector for GSM and GPS, Dual Serial Port for GSM and GPS GSM standard AT Commands, GPS NMEA Protocol, Network and Ring LED , Rugged Simcard Holder.

Features of GSM Module:

- Improved spectrum efficiency
- International roaming
- Compatibility with integrated services digital network (ISDN)
- Support for new services.
- SIM phonebook management
- Fixed dialing number (FDN)
- Real time clock with alarm management
- High-quality speech
- Uses encryption to make phone calls more secure
- Short message service (SMS)

The security strategies standardized for the GSM system make it the most secure telecommunications standard currently accessible. Although the confidentiality of a call and secrecy of the GSM subscriber is just ensured on the radio channel, this is a major step in achieving end-to-end security. A GSM modem can also be a standard GSM mobile phone with the appropriate cable and software driver to connect to a serial port or USB port on your computer.

A GPS device can retrieve from the GPS system location and time information in all weather conditions, anywhere on or near the Earth. A GPS reception requires an unobstructed line of sight to four or more GPS satellites, and is subject to poor satellite signal conditions. In exceptionally poor signal conditions, for example in urban areas, satellite signals may exhibit multipath propagation where signals bounce off structures, or are weakened by meteorological conditions.

### (C) Button Spy Camera

A hidden camera or spy camera or security camera is a still or video camera used to record people without their knowledge. The camera is "hidden" because it is either not visible to the subject being filmed, or is disguised as another object. Hidden cameras can be built into commonly used objects such as television sets, smoke detectors, clock radios, motion detectors, ball caps, plants, and mobile phones. The OV7670/OV7171 CAMERACHIPTM is a low voltage CMOS image sensor that provides the full functionality of a single-chip VGA camera and image processor in a small footprint package. The OV7670/OV7171 provides full-frame, sub-sampled or windowed 8-bit images in a wide range of formats, controlled through the Serial Camera Control Bus (SCCB) interface. This product has an image array capable of operating at up to 30 frames per second (fps) in VGA with complete user control over image quality, formatting and output data transfer. All required image processing functions, including exposure control, gamma, white balance, color saturation, hue control and more, are also programmable through the SCCB interface. In addition, OmniVision CAMERACHIPS use proprietary sensor technology to improve image quality by reducing or eliminating common lighting/electrical sources of image contamination, such as fixed pattern noise (FPN), smearing, blooming, etc., to produce a clean, fully stable color image.

## 2.1. SOFTWARE SPECIFICATIONS

### (A) Python

Python is a widely used high-level programming language for general-purpose programming, created by Guido van Rossum and first released in 1991. A interpreted language, Python has a design philosophy that emphasizes code readability (notably using white-space indentation to delimit code blocks rather than curly brackets or keywords), and a syntax that allows programmers to express concepts in fewer lines of code than might be used in languages such as C++ or Java. The language provides constructs intended to enable writing clear programs on both a small and large scale. Python features a dynamic type system and automatic memory management and supports multiple programming paradigms, including object-oriented, imperative, functional programming, and procedural styles. It has a large and comprehensive standard library. Python interpreters are available for many operating systems, allowing Python code to run on a wide variety of systems. Python, the reference implementation of Python, is open source software and has a community-based development model, as do nearly all of its variant implementations. C Python is managed by the non-profit Python Software Foundation. The images stored in the SD card are in bmp format. These images can be read using python programming.

### (B) Arduino Programming

For the location tracking system using Arduino, the software approach is given in figure below. The software used is the Arduino Integrated Development Environment (IDE) which provides a smooth platform for programming the microcontroller and the programming sequence is shown in figure The delays are included in order to allow the respective modules to initialize and synchronize with the networks.

## 3. CONCLUSIONS

Touch Me Not (A Woman Security Device) has been designed keeping in mind the increasing violence against women. This system is designed to help women in distress situations to call for help as well as alert the surrounding people. It has been developed as an idea to make the security device more portable and comfortable. This system was designed after reference to already implemented system. Here measures are being made to overcome the flaws in previous designs and also to reduce the power consumption. The following are the results obtained.

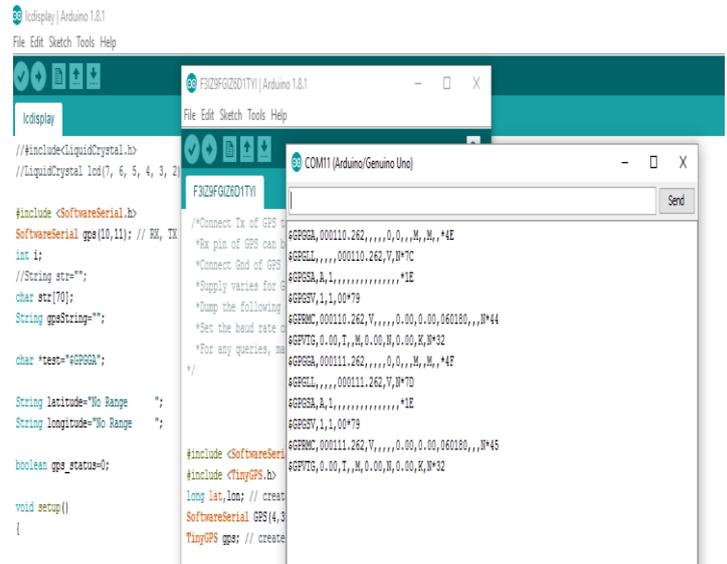


Figure 3.1: GPS receiver data.

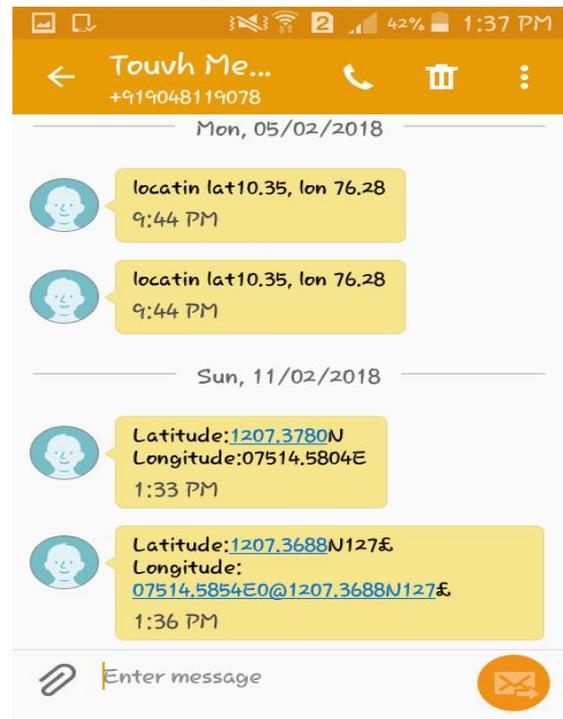


Figure 3.2: Message received showing location.

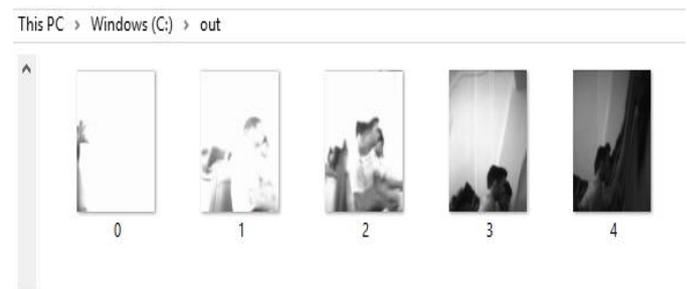


Figure 3.3: Camera Module output

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