Protect Women from Abuse and Assure Immediate Safety

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Abstract – In the past few years, women safety has become a major issue all over the world. Today's women are independent and empowered. But still, they are still concerned about their safety against the harassment and the violence and as they have to travel late night through unfamiliar areas. Even if it is true that men and women are equal in every field like men, women are not so strong physically in the emergency situations. Women should be provided with some helping hand to relieve them in the risky situations. Abuse against women cannot be controlled at all times. Women will not be surrounded by public every time. At times they would have to face these type of situations alone. There are applications and devices that exist which can help. But they will be mostly mobile and application oriented. Assurance cannot be given that they will be accompanied with a mobile phone everywhere and every time. The proposed system is where the voices of the women will be identified along with a visual support. If the abusing is really happening then immediate action will be taken by alerting the nearby police station and the public in and around the area.

Index Terms – Abuse, Threat, Security, Safety.

1. INTRODUCTION

Women are still facing unspeakable incidents like molestation, rape, acid attack etc. Many devices and applications are already available but those are ineffective as they need to be manually operated. Since the psychological state of the women is affected in danger situations and sometimes it's not possible to operate them manually. They cannot step out of their houses at any time of the day, cannot wear clothes as per their will, nor can they even go for work in peace. There is some kind of inhibition that women are subjected to which not only takes away their sense of freedom but also shatters their confidence and dreams. Due to the above said reasons, it is quite apparent that there is a striving need for women security in the country. However, it is a point worth to note that advancement in technology has paved its path in almost all walks of life. As such, it is now possible to intelligently apply the benefits of current technology to resolve societal issues. We are focusing to build an effective, fast and reliable system to make the women feel safe and empowered. This system works in such a way that it alerts the nearest police station when the distress voice is recognized and the locals are also alerted in and around the location by a sound alarm. When certain words are yelled or shouted they will be allowed to be recognized using a voice recognition sensor. With the help of this sensor the voice will be recognized and that voice will be converted to text. To achieve this conversion the voice recognizer software will be used so that the conversion of text to speech will be efficient and fast. If that text is matched with the words in our database the CCTV camera will be turned on. And this live coverage will be transmitted to the police station. After viewing the coverage the alarm will be activated if the threat or abuse is happening. This way the locals also will be alerted around the area. So that the public also will be able to work towards a common goal.

2. RELATED WORK

Various works that are existing this area are as follows:

- Design and Development of "Suraksha"
- One touch alarm system for women's safety using GSM
- SHE (Society Harnessing Equipment)
- ILA security
- AESHS (Advanced Electronics System for Human Safety)
- VithU app

- Smart Belt

- Kavalan SoS

- 112 India

2.1 Design and Development of "Suraksha"

A Women Safety Device- This paper explains the basic idea underlying suraksha which is to flash a warning giving an instant location of the distressed victim to the police so that the incident could be prevented and the culprit apprehended [1].

2.2 One touch alarm system for women's safety using GSM

This paper describes about a one touch alarm system for women's safety using GSM. In the light of recent outrage in Delhi which shook the nation and woke us to the safety issues for women, people are finding up in different ways to defend. Here we introduce a device which ensures the protection of women.

This helps to identify protect and call on resources to help the one out of dangerous situations. Anytime you senses danger, all you had to do, is hold on the button of the device. The device consists of a PIC microcontroller, GSM module, GPS modules. The system resembles a normal watch which when activated, tracks the place of the women using GPS (Global Positioning System) and sends emergency messages using GSM (Global System for Mobile communication), to sos contacts and the police control room [2].

2.3 SHE (Society Harnessing Equipment)

It is a garment embedded with an electronic device. This garment has an electric circuit that can generate 3800Kv which can help the victim to escape. In case of multiple attacks, it can send around 80 electric shocks.

2.4 ILA Security

The co-founders of this system, have designed three personal alarms that can shock and disorient potential attackers and hence safeguard the victim from perilous situations.

2.5 AESHS (Advanced Electronics System for Human Safety)

It is a device that helps track the location of the victim when attacked using GPS facility [3].

2.6 VitU app

This is an emergency app initiated by a popular Indian crime television series "Gumrah" aired on Channel [V]. When the power button of the Smartphone is pressed twice consecutively, it begins sending alert messages with a link of the location of the user every two minutes to the contacts.

2.7 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. When the threshold of the pressure sensor crosses, the device will be activated automatically. . The screaming alarm unit will be activated and send sirens asking help[4].

2.8 Kavalan SoS

The KAVALAN SOS App as a part of the Tamil Nadu State Police Master Control Room initiative, which the people of Tamil Nadu can use to seek police assistance instantly in emergency situations such as physical emergencies, eve teasing, kidnapping or natural disasters such as Floods, earthquakes etc.

2.9 112 India

In an emergency situation, a person in distress may seek for the assistance of local emergency service delivery departments and volunteers through the App. The App will send emergency alerts with the user's details (name, age, emergency contacts) and location information, along with a generated call to '112' - to the State Emergency Control Room and the person's emergency contacts. The system forwards the emergency alert to nearby online local volunteers if available.

3. PORPOSED MODELLING

A database is created with the all distress words and it will be linked with the voice recognition sensor. The voice recognition will get activated by the distress voice and will analyze the words in the voice, making a match with the distress words. If the voice gets matched automatically the camera will be activated and the live feed will be telecasted to the police control room. If the women are really in crisis then immediate action will be taken by the alerting the nearby police station. Simultaneously an emergency alarm will also be activated which will alert the public in and around devices location.

The architecture which this paper uses is as follows: This device consists of a voice recognition sensor which allows us to record the distress voices through a mic and recorder. After the recording of voices through the mic now we will be able to analyzed and converted into a text. For this process of converting the voice into text we use the Google api. Google Cloud Speech-to-Text enables developers to convert audio to text by applying powerful neural network models in an easy- to-use API. The API recognizes 120 languages and variants to support your global user base. Initially, a database will be created with all of the distress words. After the conversion of the voice into text, this text will be allowed to check with the created database. If the distress words in the

database match with the converted text then the camera will be activated. The main reason a camera is activated is to find out whether the threat is really happening or it is a prank. These cameras live feed will be transmitted to the police control room. Then, the police will view this coverage and if it is a possible threat then the police would activate an alarm which will be integrated with our device. This alarm will be used for alerting the locals in and around the location of the threat. This way the public would also be able to help. After the activation of the alarm the location will be sent to the police using a GPS module. All of the devices will be integrated with a micro controller. In this architecture we are using a raspberry pi b micro controller. With the help of this micro controller we will be allowed to connect multiple input and output devices. With the right amount of the power supply this micro controller will act a as a mini pc. It is integrated with memory and a processor along with USB ports and a LAN port for efficient connectivity. The power needed for this micro controller is 5V.
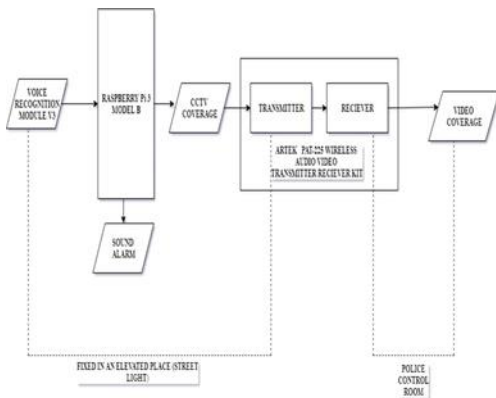

Fig.No.1: Shows Architecture of Proposed System

3.1 EXPERIMENT AND SIMULATION

Various hardware used for this research are as follows:

RASPBERRY PI 3

Raspbian comes preloaded with Python, the official programming language of the Raspberry Pi and IDLE 3, a Python Integrated Development Environment.

- University of Cambridge's Computer Laboratory
  - Decline in skill level
  - Designed for education
- A credit card sized PC
- Plugs into a TV or monitor
- Capability:
  - Programming
  - Electronic Projects

- Office
- Play HD Videos

Fig.No.2: Raspberry Pi version 3 model B

Kit Components

- Essential:
  - Raspberry Pi board
  - Prepared Operating System SD Card
  - USB keyboard
  - Display (with HDMI, DVI, or Composite input)
  - Power Supply
- Highly suggested extras include:
  - USB mouse
  - Internet connectivity - LAN cable
  - Powered USB Hub
  - Case

System on Chip (SoC)

A complex IC that integrates the major functional elements into a single chip or chipset.

- programmable processor
- on-chip memory
- accelerating function hardware (e.g. GPU)
- both hardware and software analog components
- Benefits of SoC
  - Reduce overall system cost
  - Increase performance
  - Lower power consumption
  - Reduce size

SoC in Raspberry Pi: Broadcom

- BCM2835 SoC Multimedia processor

- CPU:
    - ARM 1176JZF-S (armv6k) 700MHz
    - RISC Architecture and low power draw
    - Not compatible with traditional PC software
- GPU
    - Broadcom Video IV
    - Specialized graphical instruction sets
- RAM
    - 1GB (Model 2, 3)
    - 512MB (Model B rev.2)
    - 256 MB (Model A, Model B rev.1)

SoC in Raspberry Pi

Fig.No.3.1: BCM2835 SoC

Fig.No.3.2: Samsung K4P2G324ED Mobile DRAM

Connecting a Display and Audio

- HDMI
    - Digital signal
    - Video and audio signal
    - DVI cannot carry audio signal
    - Up to 1920x1200 resolution
- Composite RCA
    - Analog signal
    - 480i, 576i resolution
    - 3.5mm jack.

Storage: Secure Digital (SD)

- Form factor
    - SD, Mini SD, Micro SD
- Types of Card
    - SDSC (SD): 1MB to 2GB

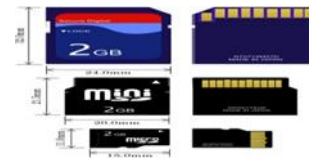- SDHC: 4GB to 32 GB
- SDXD up to 2TB

Fig.No.4: SD Card Low Speed

Peripherals

- General Purpose
- Input/output (GPIO)
    - Pins can be configured to
- be input/output
    - Reading from various
- environmental sensors
- Ex: IR, video,
- temperature, 3-axis
- orientation, acceleration. Writing output to dc motors, LEDs for status.

Raspberry Pi Setup

1. Download the Raspberry Pi operating system

    – Linux releases compatible with the Pi: http://www.raspberrypi.org/downloads

    – The recommended OS is Raspbian: http://downloads.raspberrypi.org/raspbian_latest

2. Unzip the file that you just downloaded

    – Right click on the file and choose "Extract all".

    – Follow the instructions—you will end up with a file ending in .img

    Raspberry Pi Setup

3. Download the Win32DiskImager software

    – a) Download win32diskimager-binary.zip (currently version 0.6) from: https://launchpad.net/win32-imagewriter/+ download

    – b) Unzip it in the same way you did the Raspbian

    .zip file

    – c) You now have a new folder called win32diskimager-binary.

4. Writing Raspbian to the SD card

– a) Plug your SD card into your PC

– b) In the folder you made in step 3(b), run the file named Win32DiskImager.exe

– c) If the SD card (Device) you are using isn't found automatically then click on the drop down box and select it

– d) In the Image File box, choose the Raspbian .img file that you downloaded

– e) Click Write

– f) After a few minutes you will have an SD card that you can use in your Raspberry Pi.

5. Booting your Raspberry Pi for the first time

– On first boot you will come to the Raspi-config window

– Change settings such as time zone and locale if you want

– Finally, select the second choice: expand_rootfs and say

'yes' to a reboot

– The Raspberry Pi will reboot and you will see raspberry pi.

Login:

• Username: pi, password: raspberry

– Start the desktop by typing: startx

– The desktop environment is known as the Lightweight X11

Desktop Environment (LXDE)

VOICE RECONITION

Voice Recognition Module is a compact easy-control speaking recognition board. It is a speaker-dependent module and supports up to 80 voice commands. Any sound could be trained as command. Users need to train the module first before recognizing any voice command. Voice commands are stored in one large group like a library. Any 7 voice commands in the library could be imported into recognizer. It means 7 commands are effective at the same time. For this process of converting the voice into text we use the Google api. Google Cloud Speech-to-Text enables developers to convert audio to text by applying powerful neural network models in an easy- to-use API. The API recognizes 120 languages and variants to support your global user base.

CLOSED CIRCUIT TELEVISION

Closed-circuit television (CCTV), also known as video surveillance, is the use of video cameras to transmit a signal to a specific place, on a limited set of monitors. It differs from broadcast television in that the signal is not openly transmitted, though it may employ point to point (P2P), point to multipoint (P2MP), or mesh wired or wireless links. Though almost all video cameras fit this definition, the term is most often applied to those used for surveillance in areas that may need monitoring such as banks, stores, and other areas where security is needed. Though Video telephony is seldom called 'CCTV' one exception is the use of video in distance education, where it is an important tool.

CAMERA MODULE

A camera records and stores photographic image in digital form. Many current models are also able to capture sound or video, in addition to still images. Capture is usually accomplished by use of a photo sensor, using a charged coupled device. In a camera, Light from the thing you are photographing zooms into the camera lens. This incoming "picture" hits the image sensor chip, which breaks it up into millions of pixels.

SECURITY ALARM

A security alarm is a system designed to detect intrusion – unauthorized entry – into a building or other area. Security alarms are used in residential, commercial, industrial, and military properties for protection against burglary (theft) or property damage, as well as personal protection against intruders. Security alarms in residential areas show a correlation with decreased theft.
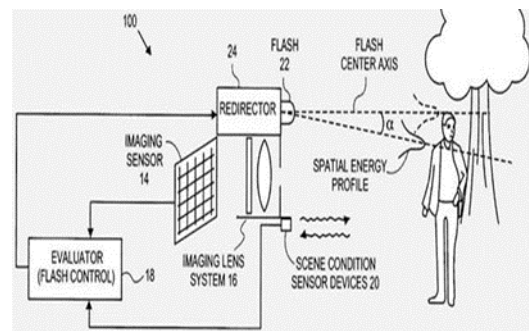

Fig.No.5: Process diagram

GPS MODULE

Global positioning system (GPS) is able to determine the latitude and longitude of a receiver on Earth by frequency 900MHz. It has up link band of 890MHz to 915MHz and down link Band of 935MHz to 960 MHz GSM takes advantages of both FDMA & TDMA. In 25MHz BW, 124 carriers are generated with channel spacing of 200 KHz

(FDMA). Each carrier is split into 8 time slots (TDMA). At available in GSM 300 [8].

4. RESULTS AND DISCUSSIONS

This system will predict whether a woman is in danger or not on the basis of her voice. Comparing to the previous devices most of it are mobile phone or device oriented. So if there is a physical abuse it might get damaged. To overcome all of that our device is totally independent and there is no need for a manual approach to activate it. This way there is no need carry any special devices around for safety.

5. CONCLUSION

This paper fulfils the objective of women security and moreover this device can be used by women while travelling alone on roads, in public transport or even at workplaces. It helps us to reduce the rate of sexual harassment. With the help of the voice recognizer, the voice of the women will be analyzed and converted to text. With the use of the camera module, the surveillance is efficient and easy. The alarm which is available in our device will alert the public nearby so that they will also be able help women during the crisis. This way the public also will be able to work towards our common goal.

6. FUTURE ENHANCEMENT

After the successful implementation of this system, the second phase of the implementation will involve Artificial Intelligence analyze inputs from mic and camera to keep track on triggers occurred. Triggers are found with the help of AI and store events stored in buffer and upcoming instance. If trigger is out of focus it sends signal to nearby nodes and keep track of instance. A trained set of events will be created and they will be analyzed with the stored footage. If the footage is matched with the trained set of events then action will be taken immediately by the Police. With the help of the Artificial Intelligence this security system is made much faster and efficient. Thus this system will help us to

any given instance of time 992 speech channels are made identify the crimes in a much faster rate.

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