



WOMEN SAFETY

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Abstract: Human Safety is an emerging paradigm for understanding global vulnerabilities whose proponents challenge the traditional notion of national security by arguing that the proper referent for security should be at the human rather than national level. Understanding of security involves a number of research fields, including development studies, international relations, strategic studies, and human rights. The system to be implemented with the help of technologies like Machine learning and IoT will be activated with the recognition of a human's voice and notify the nearest police station along with the victim's details and location. And main purpose is an alarm system that will also be activated on the nearby streets with a connection provided with the clip using IoT techniques. The system implementation will help provide maximum safety to the people along with reducing the on-going risks. Women are adept at mobilizing diverse groups for a common cause. They often work across ethnic, religious, political, and cultural divides to promote peace. We are all aware of importance of women's safety, but we must realize that they should be properly protected.so we are using this device especially for women safety.

I INTRODUCTION

Automatic continuous speech recognition (CSR) has many potential applications including command and control, dictation, transcription of recorded speech, searching audio documents and interactive spoken dialogues. The core of all speech recognition systems consists of a set of statistical models representing the various sounds of the language to be recognised. Since speech has temporal structure and can be encoded as a sequence of spectral vectors spanning the audio frequency range, the hidden Markov model (HMM) provides a natural framework for constructing such models. HMM is very rich in mathematical structure and hence can form the theoretical basis for use in a wide range of application. HMM model, when applied properly work well in practice for several important application. Real-world processes generally produce observable outputs which can be characterized as signals. The signals can be discrete in nature or continuous in nature. The signal source can be stationary (i.e., its statistical properties do not vary with time), or non-stationary (i.e., the signal properties vary over time). The signals can be pure or can be corrupted from

other signal sources or by transmission distortions. Speech recognition is a process of converting speech signal to a sequence of word. Various approaches have been used for speech recognition which includes Dynamic programming and Neural Network. In this seminar we will try to bridge speech recognition and HMM and figuring out how HMM can be effectively used in speech recognition problem

II OBJECTIVE

The main purpose of this paper is to introduce the concept of a women's safety device for application in India. The main purpose of this device is to act as an emergency device for women who are in potential danger of being attacked. The woman possessing this device will press the panic button if in danger. An SMS containing the latitude and longitude coordinates will be sent to pre fed mobile numbers informing them of the danger and the location. The received coordinates can be viewed on Google maps to determine the location of the woman and appropriate help can be provided. This concept was devised in the wake of serious crime against women in India and to help curb those crimes.



III LITERATURE SURVEY

- **A smart watch for women security based on IoT concept ‘watch me’**

Today, in the current global scenario, Women were facing lot of challenges. We can hear the news of women harassments than their achievements. There are many existing apps and devices for women security via smart phones. Though the smart phones have increased rapidly, it is not possible to have the phone all the time in our hand to make a call or click on it, so here we introduced a new technique via smart watches. When a women or child wearing this ‘watch me’ is exposed to sexual or vulnerable attack, the sensor present in it detects the heart beat rate of a person which will be high at the moment by the secretion of epinephrine hormone from hap axis and gets activated, this will not only provide an alarm sound to the attention of nearby people, it will automatically make an call to our registered contact and also through GPS/GSM it will detect the nearby police station and make an ring there so it will be helpful for police to arrive soon at the spot by tracking the GPS , such a system will lead to safer and better environment.

- **Hidden markov model and speech recognition**

Modeling signal model for speech recognition is challenging task. It gives us great deal of information about problem being modeled. In this seminar we will see how Hidden Markov Model is used to model speech recognition application. We start with mathematical understanding of HMM followed by problem faced by it and its solution. Then we move to block diagram of speech recognition which include feature extraction, acoustic modeling and language model, which works in tandem to generate search graph. Use of HMM in acoustic modeling is explained. At the end we will look at isolated word recognizer using HMM. Real-world processes generally produce observable outputs which can be characterized as signals. The signals can be discrete in nature or continuous in nature. The signal source can be stationary (i.e., its statistical properties do not vary with time), or non-stationary (i.e., the signal properties vary over time). The signals can be pure or can be corrupted from other signal sources or by transmission distortions. It also focuses on three fundamental problems for HMM, namely the probability of observation sequence given the model i.e., $P(O|\lambda)$; the determination of single

best state sequence, given the observation sequence $O = O_1, O_2, \dots, O_T$; and the adjustment of model parameter $\lambda = (A, B, \pi)$ to maximize recognition probability. It also describes the method to efficiently solve this problem. Section 2 gives mathematical understanding of Hidden Markov Model. It also focuses on three fundamental problems for HMM, namely: the probability of observation sequence given the model i.e. $(O|\lambda)$; the determination of single best state sequence, given the observation sequence $O = O_1, O_2, \dots, O_T$; and the adjustment of model parameter $\lambda = (A, B, \pi)$ to maximize recognition probability. It also describes the method to efficiently solve this problem. Section 3 explains block diagram of speech recognition system. We start with acoustic model design using vector quantization which is used to convert feature vector to symbol. It also explains how the algorithms described in 2nd section are used to solve the problem associated with speech recognition. This section discusses in detail about evaluation problem and Viterbi algorithm for finding “single best” state sequence. Finally, bi-gram language model is explained. In Section 4, we will apply all technique discuss in previous section to understand the working of isolated word recognizer.

- **Voice log-in using spoken name input**

The invention relates generally to voice recognition, and more particularly relates to a voice log-in method for granting a person access based on recognition of that person's spoken name, without the use of additional codes or passwords. In even greater particularity, voice log-in is implemented using an HMM (Hidden Markov) modeling technique in which, to accommodate pure datable variations in the duration of pauses between a person's first and last name, the full-name models for the spoken rendition of a person's name are augmented by: (a) inserting skip transitions for pauses between the name-part utterances within the full-name HMM model, or (b) including no speech HMM models for pauses between the subpart or name-part HMM models in a full-name FSA (finite state automaton) model. Speaker recognition generally includes the tasks of speaker.

- **Identification and speaker verification**

Speaker identification involves labeling an unknown voice as one from a set of known voices, while speaker verification involves determining whether an unknown voice matches the known voice of a speaker



whose identity is being claimed. In particular, speaker identity verification based on a person's voice is of considerable interest for providing telephone access to such services as banking transactions, credit card verification, and remote access to dial-up computer databases. The specific problem for which the invention has application is providing verified access to medical records databases for health care providers. For example, a voice log-in system would be used by doctors to obtain verified access to a number of medical databases at different health care institutions. Speaker recognition generally includes the tasks of speaker identification and speaker verification. Speaker identification involves labeling an unknown voice as one from a set of known voices, while speaker verification involves determining whether an unknown voice matches the known voice of a speaker whose identity is being claimed. In particular, speaker identity verification based on a person's voice is of considerable interest for providing telephone access to such services as banking transactions, credit card verification, and remote access to dial-up computer databases. The specific problem for which the invention has application is providing verified access to medical records databases for health care providers. For example, a voice log-in system would be used by doctors to obtain verified access to a number of medical databases at different health care institutions.

IV PROPOSED SYSTEM

The device equally provides safety measures to men as well as women. The device is easily attachable to the garment and bags the device being in the form of an attachable clip. Unlike other devices proposed device does not contain any button but it takes voice as an input, as soon as the victim says "help".

Once the voice input is received the device gets activated and sends alert to nearby police stations with the victim's GPS location and entire details i.e. phone number, photo, name, age, etc. which will be stored during the registration. The most important factor of proposed system is that as soon as the victim calls for help it sends signals to the nearby buzzers that will be implanted on the streets or the street lights and the low light areas. Also, light buzzers will also be provided for this purpose, along with noise the light will also be reflected which can be a sign of alert for danger for the nearby people who could arrive for help.

So, basically our device gets activated by giving the input voice or by saying help in a particular sequence. Unlike other devices it does not consist of button to get started, hence voice recognition is a very important point in our project.

V SOFTWARE REQUIREMENTS SPECIFICATION

Introduction

Internet of Things (IoT) is revolutionizing the way devices/things interact with each other. And when you have IoT with Python on your side, you'll be able to build interactive objects and design them. ... By the end of the book, you will be able to develop IoT prototypes with Python, libraries, and tool. Programming for IoT is usually a polyglot (multiple languages) effort since the Internet-of-Things (IoT) is a system of inter-related computing devices that are provided with unique identifiers and the ability to transfer data over a network.

Project Scope

This proposed project deals with a quick responding, cost protection system for an individual and especially for women using which a woman in anguish can call for help just with the press of a button on this smart gadget. Self Defense module for women safety is like a Smart Watch for Women safety. It has the ability to help women with technologies that are embedded into a compact device. It has the potential to help women with technologies that are embedded. It is specially designed for women safety and protection. It has a control button that will be used by women to inform nearby police when they are in distress. This watch directly gets connected to the satellite through GPS when activated. Then the location is transferred through the GSM, it also contains a shock mechanism to produce non-lethal electric shock in emergency situations to deter the attacker.

User Classes and Characteristics

User Interfaces

Button

A Push to make switch allows electricity to flow between its two contacts when held in. When the button is released, the circuit is broken. This type of switch is also known as a Normally Open (NO) Switch.

HMM Device

The hidden Markov model can be represented as the simplest dynamic Bayesian network. The mathematics



behind the HMM were developed by L. E. Baum and coworkers. HMM is closely related to earlier work on the optimal nonlinear filtering problem by Ruslan L. Stratonovich, who was the first to describe the forward-backward procedure. In simpler Markov models (like a Markov chain), the state is directly visible to the observer, and therefore the state transition probabilities are the only parameters, while in the hidden Markov model, the state is not directly visible, but the output (in the form of data or "token" in the following), dependent on the state, is visible. Each state has a probability distribution over the possible output tokens. Therefore, the sequence of tokens generated by an HMM gives some information about the sequence of states; this is also known as pattern theory, a topic of grammar induction. The adjective hidden refers to the state sequence through which the model passes, not to the parameters of the model; the model is still referred to as a hidden Markov model even if these parameters are known exactly.

Hardware Interfaces

- Button

A push to make switch allows electricity to flow between its two contacts when held in. When the button is released, the circuit is broken. This type of switch is also known as a Normally Open (NO) Switch.

- HMM Device

The hidden Markov model can be represented as the simplest dynamic Bayesian network. The mathematics behind the HMM were developed by L. E. Baum and coworkers. HMM is closely related to earlier work on the optimal nonlinear filtering problem by Ruslan L. Stratonovich who was the first to describe the forward-backward procedure. In simpler Markov models (like a Markov chain), the state is directly visible to the observer, and therefore the state transition probabilities are the only parameters, while in the hidden Markov model, the state is not directly visible, but the output (in the form of data or "token" in the following), dependent on the state, is visible. Each state has a probability distribution over the possible output tokens. Therefore, the sequence of tokens generated by an HMM gives some information about the sequence of states; this is also known as pattern theory, a topic of grammar induction. The adjective hidden refers to the state sequence through which the model passes, not to the

parameters of the model; the model is still referred to as a hidden Markov model even if these parameters are known exactly.

- Raspberry-PI

The original model became far more popular. The Raspberry Pi is a series of small single-board computers developed in the United Kingdom by the Raspberry Pi Foundation to promote teaching of basic computer science than anticipated, selling outside its target market for uses such as robotics. It does not include peripherals (such as keyboards and mice) or cases. However, some accessories have been included in several official and unofficial bundles.

Processor speed ranges from 700 MHz to 1.4 GHz for the Pi 3 Model B+ or 1.5 GHz for the Pi 4; on-board memory ranges from 256 MB to 1 GB with up to 4 GB available on the Pi 4 random-access memory (RAM). Secure Digital (SD) cards in Micro SDHC form factor (SDHC on early models) are used to store the operating system and program memory. The boards have one to five USB ports. For video output, HDMI and composite video are supported, with a standard 3.5mm tip-ring-sleeve jack for audio output. Lower-level output is provided by a number of GPIO pins, which support common protocols like I²C. The B-models have an 8P8C Ethernet port and the Pi 3 and Pi Zero W have on-board Wi-Fi 802.11n and Bluetooth. Prices range from US\$5 to \$55.

- NodeMCU

NodeMCU is an open source IoT platform. It includes firmware which runs on the ESP8266 Wi-Fi SoC from Espressif Systems, and hardware which is based on the ESP-12 module. The term "NodeMCU" by default refers to the firmware rather than the development kits. The firmware uses the Lua scripting language. It is based on the eLua project, and built on the Espressif Non-OS SDK for ESP8266. It uses many open source projects, such as luajson and SPIFFS

- Buzzer Module:

A buzzer or beeper is an audio signaling device, which may be mechanical, electromechanical, or piezoelectric. Typical uses of buzzers and beepers include alarm devices, timers and confirmation of user input such as a mouse click or keystroke.

Software Interface

- Arduino IDE (with ESP8266 Library installed):
- Python Package

Communication Interfaces

- Serial Peripheral Interface (SPI)
- Integrated-Circuit bus (I2C)
- ESP8266 Wi-Fi SoC from Espressif Systems

Performance Requirements

This document will provide general description of the project product perspective, and overview of requirement, general constraint and user view of the product while using. In addition will also provide the specific requirement and functional needs for this project such as interface, functional and performance requirements. The purpose of this software requirement specification is to properly document the requirement of the user necessary in order to implement this device.

Software Requirement this system compromises with python programming language, using Arduino IDE software, database management is done in MySQL, mongo DB and the documentation of this system is done using MS-Office.

Safety Requirements:

- Device must be ON
- Good Network Connectivity
- Battery Backup
- Hidden

Security Requirements:

- Password Encrypted.
- Individual ID

System Requirements

Database Requirements

- SQLite

SQLite is a C-language library that implements a small, fast, self-contained, high-reliability, full-featured, SQL database engine. SQLite is the most used database engine in the world. SQLite is built into all mobile phones and most computers and comes bundled inside countless other applications that people use every day. The SQLite file format is stable, cross-platform, and backwards compatible and the developers pledge to keep it that way through at least the year 2050. SQLite database files are commonly used as containers to transfer rich content

between systems and as a long-term archival format for data. There are over 1 trillion SQLite databases in active use SQLite source code is in the public-domain and is free to everyone to use for any purpose

Software Requirements

- Arduino IDE (with ESP8266 Library installed)
- Downloaded file of Arduino IDE software
- In IDE in Board manager we have type ESP8266 and install it for generic ESP8266 module.

VI SYSTEM DESIGN

▪ System Architecture

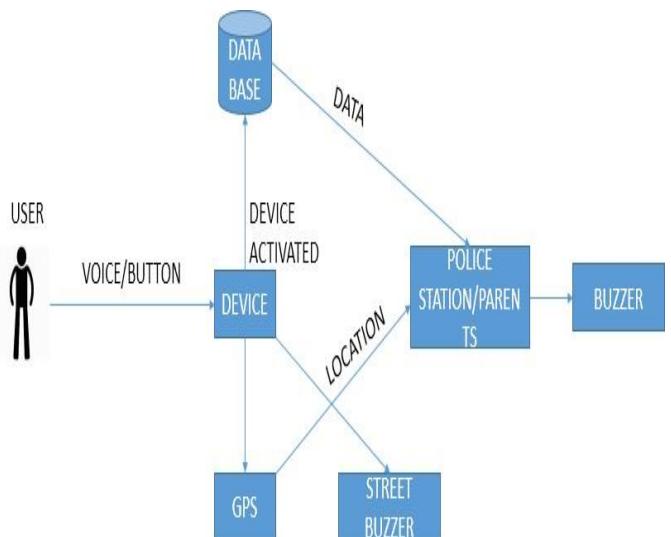


Fig.6.1 System Architecture

▪ Sequence Diagrams

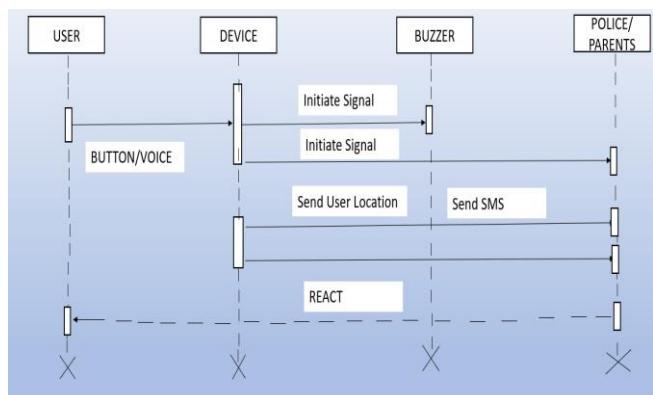


Fig.6.2 Sequence Architecture

▪ Data Flow Diagram

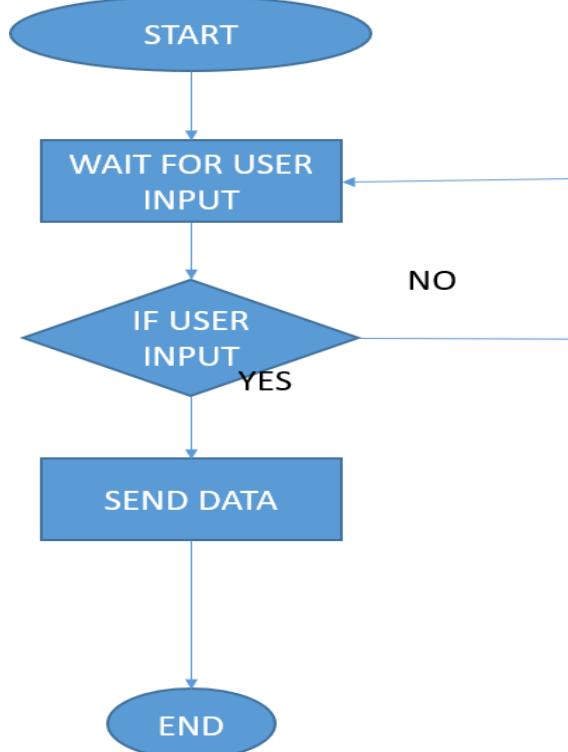


Fig.6.3 Data Flow Diagram

▪ Use Case Diagram

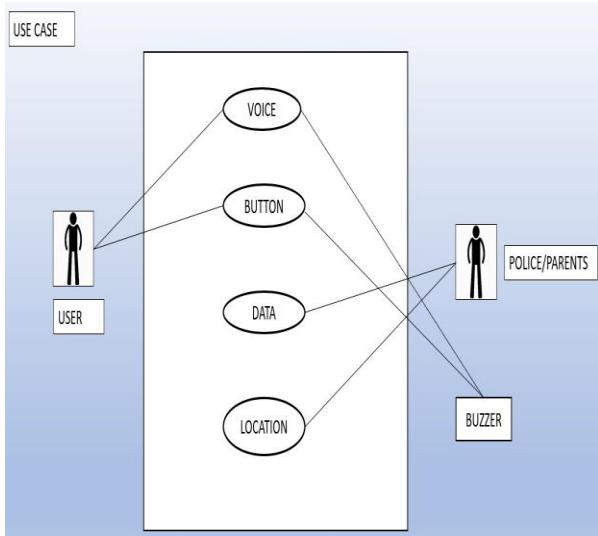


Fig.6.4 Use Case Diagram

▪ Component Diagram

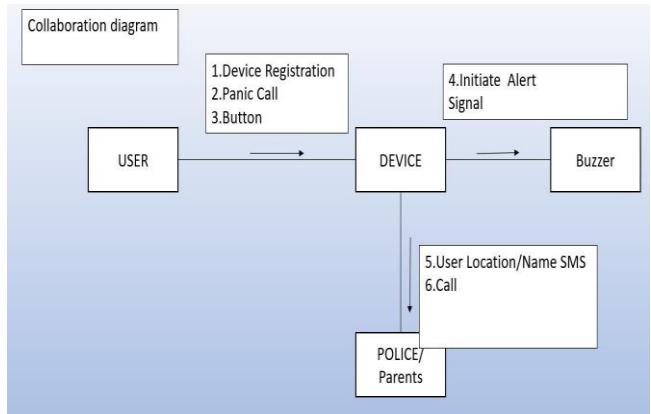


Fig.6.5 Component Diagram

VII PROJECT MODEL



Fig.7.1 Final Prototype

VIII FUTURE SCOPE

Primary School Children Safety

As the school children safety are major concerns for parents as well as school management due to the recent incidents of child crimes like children missing, abuse etc. This module monitors the child safety when they are travelling in school buses. Once they reached the school the device gets



deactivated by school authority and message send the parents that, “the child reaches the school safely”. At return journey again the device is activated by school authority and when they reached the home, the acknowledge message is send to the school when parents deactivate the device. The device is capable of audio recording when activated that can be listening by the parents or authorize person.

Vehicle Safety System Module

The Safety of four-wheeler car is also a major concern in the society due to the increase in the crime rate of stolen car. The intrusion detection module can be modified according to the requirement of vehicle safety system module.

Mobile and other valuables Safety System Module

The missing rate of mobiles is high while travelling from bus, train or crowded public area. The area zone module functionality further enhances to provide safety. A small device needed to keep either in same pocket or within the range of few centimetres. As you kept the mobile and forgot to pick up or someone stolen it then due to small range the siren of mobile as well as device gets ON for user attention. Also, the same device can attach to our luggage, hence in case of forgetting to pick back or try to stole by someone can be easily noticed by the module and make the attention of user through the siren alarm

Hence, the advance technology makes the system more robust and reliable. As the new modules provide the functionality which enhance the safety and security. Thus it helps to fulfil the purpose of the project.

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