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Survey on "Laxmanrekha-Woman Safety And Alert System"

Samruddhi Kute, Jayshree Gupta, Pratiksha Sonawane,
Surabhi Sonawane, Girija Chiddarwar
Department of Computer Engineering,
Sinhgad College of Engineering, Pune,MH,India

***Abstract*- Every day, every woman, young girls, mothers and ladies from all walks of life are struggling to be safe and protect themselves from the roving gaze of the horribly insensitive men who molest assault and violate the dignity of women on a daily basis. The streets, public transport, public places in particular have become the dominion of the hunters. Due to these atrocities that women are subjected to in the present scenario, a smart security wearable device for women based on Internet of Things is proposed. This device is extremely portable and can be activated by the victim on being assaulted just by the click of a button that will fetch her current location and also capture the image of the attacker via camera. The location will be sent to predefined emergency contact numbers or police via smart phone of the victim thus preventing the use of additional hardware devices/modules and making the device compact. Crime against women lately has become problem of each nation round the globe many countries try to curb this problem. Preventive are taken to scale back the increasing number of cases of crime against women. A huge amount of knowledge set is generated per annum on the idea of reporting of crime. This data can prove very useful in analyzing and predicting crime and help us prevent the crime to some extent. Crime analysis is a neighborhood of importance in local department. Study of crime data can help us analyze crime pattern, inter-related clues and important hidden relations between the crimes.**

***Keywords*- Women safety, Arduino, GSM (Global System for Mobile communication), GPS (Global Positioning System), Audio Recording, Mobile Application.**

I. INTRODUCTION

In the present scenario, women are keeping pace with men in every walk of life but unfortunately at cost of being subjected to abuse, harassment, and violence in public and even at their own houses. 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. This paper, therefore, aims to apply the current trend in technology, i.e., Internet of Things (IoT) to eliminate fear filled lifestyle of female folks. The Internet of Things (IoT) is an ecosystem of connected physical objects that are accessible through the web. It refers to the ever-growing network of physical objects that feature an IP address for internet connectivity, and therefore the com munication that happens between these objects and other Internet-enabled devices and systems.

The crime rates accelerate continuously and the crime patterns are constantly changing. According to National Crime Records Bureau, crime against women has significa ntly increased in recent years. It has become the foremost before the administration to enforce law & order to scale back this increasing rate of the crime against women. We illustrate how social development may lead to crime prevention. So we are developing the system which can used to detect and predict the crimes for the area where the person or user currently stand.

II. LITERATURE SURVEY

"Smart Security Solution for the women based on IOT", which presents Shift Route,a newLPPM specially designed for map services on smartphones. ShiftRoute enables smartphone users to query a route between two endpoints on the map, without revealing any meaningful location information. Specifically, we design a protocol to allow a mobile client to retrieve point of interests (POIs) close to the original endpoints, and an algorithm that selects shifted endpoints from these POIs, that achieves the privacy property of Geo-Indistinguishability. Experimental results

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show that Shift Route strikes a good trade off between location privacy and service usability.

Data mining: concepts and techniques, Jim Gray, Series Editor Morgan Kaufmann Publishers- With the popularity of location-awaredevices(e.g.,smart phones),large amounts of location-based social media data (i.e., user check-in data) are generated, which stimulate plenty of works on personalized point of interest(POI)recommendations using machine learning techniques.However,most of the existing works could not recommend POIs in a new city to a user where the user and his/her friends have never visited before. We propose a common topic transfer learning graphical model the common-topic transfer learning model (CTLM)–for crossing-city POI recommendations.

Women safety device designed using IOT and machine learning- We propose a novel framework to protect user privacy while ensuring efficiency.Our framework also uses redundant POI records to protect privacy against LBS provider but employs a semi-trusted third party, called proxy, to filter out redundant POI records. To protect pri vacy against proxy, we design a novel filtering protocol, Blind filter, to allow the proxy to filter out redundant encrypted POI records in a blind way. In comparison with existing solutions, our framework is not only resilient to dual identity attack, but also incurs lower communication and computation overhead. Comprehensive analysis and experiments show that our framework is secure and highly efficient in mobile environments.

III. PROJECT OVERVIEW

This Project will capture the images and track the location when enter in unsafe area. This will help in deployment of police at most likely places of crime for any given period of time, to allow most effective utilization of police re sources. The developed model will reduce crimes and will help the crime detection and will provide the assurity for safety. In our system we use the woman safety module for the purpose of security. Here we are using Android appli cation as an interaction module.

There are number of different algorithms present for clus tering and classification but we applied K-Means Clu stering algorithm andKNN becaus it gives a great solution for pre-clustering and classification, reducing the space in to disjoints smaller subspaces where other clustering algo rithms can be applied.K-Means and KNN are the simplest.

1. K-Means:
K-Means Algorithm is used for grouping similar type of crime from dataset. K-Means is one among the only un supervised learning algorithms that solve the well-known clustering problem. The procedure follows an easy and straightforward thanks to classify a given data set through a particular number of clusters (assume k clusters) fixed Apriori. The main idea is to define k centers, one for every cluster. These centers should be placed during a cunning way due to different location causes different result. So, the higher choice is to put them the maximum amount as possible distant from one another. The next step is to require each point belonging to a given data set and asso ciate it to the closest center. When no point is pending, the primary step is completed and an early group age is completed. At now we'd like to re-calculate k new centr oids as barycenter of the clusters resulting from the previous step. After we've these k new centroids, a replac ement binding has got to be done between an equivalent data set points and therefore the nearest new center. A loop has been generated. As a result of this loop we may notice that the k centers change their location step by step until no more changes are done or in other words centers do not move any more.

2. KNN:
K nearest neighbors is a algorithm that stores all available cases and classifies new cases based on a similarity mea sure (e.g. distance functions).K-Nearest Neighbors is one among the foremost basic yet essential classification algo rithms in Machine Learning. It belongs to the super vised learning domain and finds intense application in pattern recognition, data processing and intrusion detection.

It is widely disposable in real-life scenarios since it is non-parametric, meaning; it does not make any underlying assumptions about the distribution of data (as opposed to other algorithms such as GMM, which assume a Gaussian distribution of the given data).

We are given some prior data(also called training data) which classifies coordinates into groups identified by an attribute.

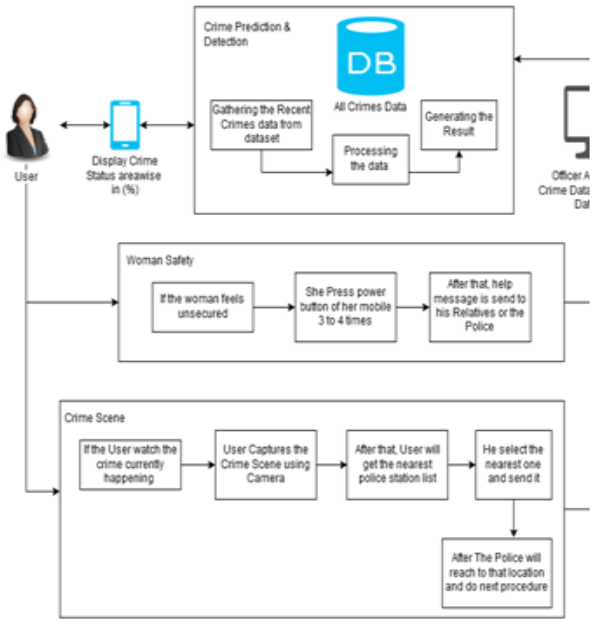

Fig 1. Algorithm(K-Means and KNN).

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3. Hardware Architecture:

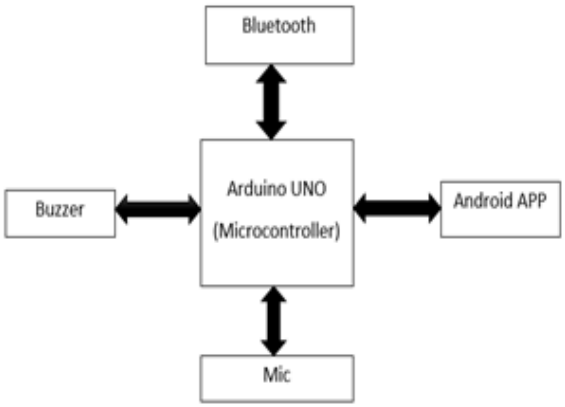

Fig 2. Model of Architecture.

IV. HARDWARE COMPONENT DETAILS

1. Arduino UNO:

The Arduino Uno is a microcontroller board based on the ATmega328. It has 20 digital input/output pins (of which 6 can be used as PWM outputs and 6 can be used as analog inputs), a 16 MHz resonator, a USB connection, a power jack, an in-circuit system programming (ICSP) header, and a reset button. It contains everything needed to supportthe microcontroller;simply connect it to a computer with a USB cable or power it with a AC-to-DC adapter or battery to get started.

Fig 3. Arduino UNO

The Uno differs from all preceding boards in that it does not use the FTDI USB-to-serial driver chip. Instead, it features an ATmega16U2 programmed as a USB-to-serial converter. This auxiliary microcontroller has its own USB bootloader, which allows advanced users to reprogram it.

The Arduino has a large support community and an extens ive set of support libraries and hardware add-on "shields" (e.g. you can easily make your Arduino wireless with our Wixel shield), making it a great introductory platform for embedded electronics. Note that we also offer a SparkFun Inventor's Kit, which includes an Arduino Uno along with an assortment of components (e.g. breadboard, sensors, jumper wires, and LEDs) that make it possible to create a number of fun introductory projects.

This is the 3rd revision of the Uno (R3), which has a number of changes:

- The USB controller chip changed from ATmega8U2 (8K flash) to ATmega16U2 (16K flash). This does not increase the flash or RAM available to sketches.
- Three new pins were added,all of which are duplicates of previous pins.The I2C pins (A4,A5) have been also been brought out on the side of the board near AREF. There is a IOREF pin next to the reset pin, which is a duplicate of the 5V pin.
- The reset button is now next to the USB connector, making it more accessible when a shield is used.

2. Buzzer:

A buzzer is a small yet efficient component to add sound featuresto our project/system. It is very small and compact 2-pin structure hence can be easily used on breadboard, Perf Board and even on PCBs which makes this a widely used component in most electronic applications.

Fig 4. Buzzer.

There are two types are buzzers that are commonly available. The one shown here is a simple buzzer which when powered will make a Continuous Beeeeeeppp.... sound, the other type is called a readymade buzzer which will look bulkier than this and will produce a Beep. Beep. Beep. Sound due to the internal oscillating circuit present inside it. But, the one shown here is most widely used because it can be customised with help of other circuits to fit easily in our application.

This buzzer can be used by simply powering it using a DC power supply ranging from 4V to 9V. A simple 9V battery can also be used, but it is recommended to use a regulated +5V or +6V DC supply. The buzzer is normally associated with a switching circuit to turn ON or turn OFF the buzzer at required time and require interval.

Applications of Buzzer:

- Alarming Circuits, where the user has to be alarmed about something.
- Communication equipment's.
- Automobile electronics.
- Portable equipment's, due to its compact size.

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3. HC-05 Bluetooth Module:
HC-05 module is an easy to use Bluetooth SPP (Serial Port Protocol) module, designed for transparent wireless serial connection setup.

Fig 5. HC-05 Bluetooth Module.

Serial port Bluetooth module is fully qualified Bluetooth V2.0+EDR (Enhanced Data Rate) 3Mbps Modulation with complete 2.4GHz radio transceiver and baseband. It uses CSR Bluecore 04-External single chip Bluetooth system withCMOStechnology and with AFH(Adaptive Frequency Hopping Feature).It has the footprint as small as 12.7mm x27mm.Hope it will simplify your overall design/ develop ment cycle. Bluetooth serial modules allow all serial enabled devices to communicate with each other using Bluetooth.

It has 6 pins;

3.1 Key/EN: It is used to bring Bluetooth module in AT commands mode. If Key/EN pin is set to high, then this module will work in command mode. Otherwise by default it is in data mode. The default baud rate of HC-05 in command mode is 38400bps and 9600 in data mode.

3.2 HC-05 module has two modes,

3.3 Data mode: Exchange of data between devices.

3.4 Command mode: It uses AT commands which are used to change setting of HC-05. To send these commands to module serial (USART) port is used.

3.5 VCC: Connect 5 V or 3.3 V to this Pin.

3.6 GND: Ground Pin of module.

3.7 TXD: Transmit Serial data (wirelessly received data by Bluetooth module transmitted out serially on TXD pin)

3.8 RXD: Receive data serially (received data will be transmitted wirelessly by Bluetooth module).

3.9 State: It tells whether module is connected or not.

3.10 Information:

- HC-05 has red LED which indicates connection status, whether the Bluetooth is connected or not. Before connecting to HC-05 module this red LED blinks continuously in a periodic manner. When it gets connected to any other Bluetooth device, its blinking slows down to two seconds.
- This module works on 3.3 V. We can connect 5V supply voltage as well since the module has on board 5 to 3.3 V regulator.
- As HC-05 Bluetooth module has 3.3 V level for RX/TX and microcontroller can detect 3.3 V level, so, no need to shift transmit level of HC-05 module. But we need to shift the transmit voltage level from microcontroller to RX of HC-05 module.

4. MIC:

4.1 The Electret Microphone:
Most "sound sensor" boards available feature a specific kind of microphone: the electret microphone. The Grove Sound Sensor features this microphone:

Fig 6. MIC.

The electret microphone is a type of condenser micro phone.Condensers are essentially capacitors and condenser microphones are formed by a thin diaphragm mounted in front of a plate. Recall that a capacitor is formed by two conductors with an insulator, or dielectric, between them. Both the diaphragm and the plate are conductors. The smaller the distance between these two conductors, the higher the capacitance, given that the surface areas of the conductors are unchanged.

When sound reaches the condenser,the diaphragm vibrates thereby changing the distance between the conductors and effectively changes thecapacitance between the diaphragm and the plate.This capacitance is converted to voltage with the application of a sufficient charge on the condenser. The voltage is boosted through a built-in transistor inside the microphone as shown in the picture above.

Now condenser microphones need high voltages to main tain that charge. An electret microphone doesn't need high voltages because the diaphragm is made out of a special material that stores a high enough charge. This material, which is the electret, is like a permanent magnet but stores a permanent charge.

The voltage changes that are produced by sound should be enough to be detected by an Arduino. This is why sound sensors often always have an operational amplifier IC included. For my Grove Sound Sensor board, the LM358 is the op-amp.

2. Using an Arduino Microphone:
Since the sound sensor board produces a changing voltage, we'll need the Arduino's analog-to-digital converter to process that voltage. Here's a sketch that reads the voltage from the sound sensor connected to A0 which is then displayed on the Arduino IDE's serial plotter.

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V. CONCLUSION

The primary goal of building this project is to ensure every woman in our society to feel safe and secured. According to the survey in India 53% of working women are not Safe-Women is working in night shifts (Bangalore-56%, Chennai-28%,Mumbai-26%,Hyderabad-35%).

This project can play a major role by providing women a system which alerts the women before entering into any unsafe areas and will detect different types of crimes as per the police station records. This system will also help to track the current location and send it to emergency contacts and the nearest police stations with the help of different classif ication and clustering algorithms.

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