

ASSAULT MITIGATION SYSTEM USING MACHINE LEARNING

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Abstract

In today's world, there are enormous evil activities that parasite our lives, and also nowadays people are facing many problems based on their safety. Assault is one of them. According to the present statistics around 16 individuals are subjected to the victims of the assault incidents every minute in our society and collection of evidence during post analysis has become very difficult. The application which is proposed has the flexibility to track location and will send messages to the nearby police stations and the scanned phone numbers. This application isn't just utilized for cases like burglary, assaults and any deviants prodding young ladies yet this additionally encourages them from any awful condition or any medical issue like swooning out of nowhere or any accidents. GPS tracker is to follow the location of the victim and to send messages about the location of the victim to the nearby police station and the phone numbers of the relatives of the victim. This application helps people to overcome their fear of going out and do things that they like to do. The incident details are transmitted to the Government's central database which is utilized for future predictions by the machine learning algorithm.

Our IoT device using machine learning overcomes the above problem, by monitoring the individual via sending the current location to the authorized devices (including Government officials) of the family. In case the situation is going out of control, the victim can access his/her self-defense equipment to protect themselves.

Keywords: Arduino IDE software ,IOT, Machine Learning

1.Introduction

Women are the backbone of any economy primarily shaping well before the country. Assaults, harassment, and murder are a couple of the foremost common human rights violations within the world as defined by India. In Today's World, the safety of women is in be wrong surrounded by, especially in India. The rate of crimes adjoining women is not decreasing but increasing at an alarming rate especially harassment, molestation, eve-teasing, rape, kidnapping, and domestic swearing. Many preventive procedures have been taken by the face to decline these misbehaving

behaviours but still have not affected the appendix rate of these crimes and have remained unaffected. The majority of such cases are happened to a girl by men working at tall positions in an doling out. Women are getting kidnapped all forty-four minutes, raped all forty-seven minutes.

The apprehension of assaults adjoining women is not lonely the condition outdoor but it may as well as happen at homes, Women are not so physically fit as compared to men for that excuse in skirmish of a dependence a helping hand would be a boon for them. Students perspective incidents taking into account child trafficking and kidnapping once they are waiting to embark or disembark a theoretical bus. Sometimes there might be a matter that in addition to women had a mishap in the late night and there is no one to in the by now them, in such situations the person will not be lithe to post the issue that he/she facing. Nowadays even though there are many apps and devices evolved for women safety via IoT which can be activated on your own by append or one click or shake the mobile.

The unaccompanied unconditional to the millstone can be taken in a such a quirk that, women should be assigned gone a safety gadget that is portable and ensures her safety. Our project focuses considering mention to providing anAssault Mitigation System based a propose IoT solutions that not by yourself helps to he/she flee the unfriendly situations but also ensures to have the funds for justice to the women defending themselves from the culprit if in fact any harassment occurs. And these incidents help us to predict where all these assaults are going to happen.

1.1 Problem Statement

A group is an organization of individuals lives in persistent social associations, or a large social outfit sharing the connected spatial or social territory. Societies construct patterns of behaviour by deeming pardon happenings or speech as comfortable or unacceptable. These patterns of behaviour within a reply outfit are known as societal norms. But there are some people in our energy where they evade, overstep our societal norms by attempting crimes which cause flashing to people conformity and has become a terrible threat to one safety. Our project ensures to present the utmost safety proceedings to one individual and minimize the crime rate as low as feasible. Women are the subject of mistreating inside and outdoor the dwelling state whether

upon roads, trains, cabs, schools, etc. Women fill about half the globe. But their relic has always been an ask as it comes to existence furthermore rave review and dignity. Women empowerment in the country can be brought together in the middle of their safety and security are ensuring, either it may be at perch, public places, or during traveling.

2.Motivation

In the talent world, people are conscious of a charity where the term crime has become a part of our animatronics. The crime rate is increasing drastically day by hours of the day and the number of ways to deed these crimes is limited to the people. Advancements in technology, supplying a broad vary of possibilities to many, mainly in the fields of the Internet of Things and Machine Learning.The Internet of Things may be a machine of interrelated computing devices, mechanical and digital machines supplied brooding about special identifiers and therefore the recognition to modify records above a community except requiring human-to-human or human-to-computer contact. Machine learning is the psychoanalysis of computer algorithms that mass automatically through experience. It is seen as a subset of gloomy penetration. Our project is built just about the above-mentioned technologies where each technology plays a necessary role in combating and ensuring the minimization of crime rate as low as reachable. The challenging situations facing by each girl nowadays gave the slope earliest going on gone a security device to urge concerning the subject of the women to get your hands on the court war they liked to obtain sticking together of. The application helps women to overcome their dread and can roam freely and conclusive their works.

2.1 Existing System

The status of women in India has gone through many great changes over the past few thousand years. From equal status with men in ancient times through the low points of the medieval period to the promotion of equal rights by many reformers, the history of women in India has been eventful. In India, every day more than 30 women were murdered and many are suffering austere mental and physical trauma. Having this concern in mind many developers have come up with creative applications. Some such applications are.

1. **Vith U App:** It is an emergency App that, at the click on of the electric button of your smartphone two instances consecutively starts sending out alert messages

2. **Self-defense Keychain:** The robust but light-weight aluminum object has a threaded manage format for a association and relaxed grip. The assault head elements a blunt however targeted factor that can damage a window or injure a predator so you can escape.
3. **Smart Jewelry:** These dainty, discreet necklaces and bracelets seem to be like any different piece of modern-day jewelry;however, they clearly go to work for you at some point of an emergency. Their minimal steel charms talk with your smartphone by means of Bluetooth, so they double as a sublime on-the-go panic button.

2.2.1.Limitations of Existing System

- Expensive
- Most the people fail to operate the devices
- Lack of event data (location and time)

2.2 Proposed System

The proposed system requires designing a system where GPS and GSM modules are primarily used to find and locate the victim at the time of the assault. Assault mitigation system is an artificial application that helps to prevent the assaults happening in society. It is used to assist in the public protection services to not to happen these types of assaults anywhere in the country. For the brief understanding of the project, we divide into two phases:

2.2.1 Assault System:

This system consists of an Arduino board that acts as a processor, Fingerprint sensor, and GPS module and GSM module. Arduino Board takes input from the fingerprint sensor as authenticated; the device gets turned on. The GPS module tracks his/her location and by sending to the SOS contacts by using the GSM module.

2.2.2 Mitigation System:

This system is completely based on Machine Learning i.e using the Linear Regression algorithm. By taking the previous assaults as data includes their location, time, the type we are going to predict the future where it is going to happen and get statistics at what percentage the assaults are

happening in a specific location. This mitigation system software will be with the police department to make no other person should be harmed.

2.3.Advantages

- Highly sensitive, Low cost and reliable circuit.
- Works according to the soil condition.
- Elimination of man power.
- System can be set to manual option too.

3.Introduction on Technologies Used in Assault Mitigation System

3.1 Internet of Things (IOT):

The Internet of Things (IoT) refers to the use of intelligently aligned devices and systems to leverage data gathered by embedded sensors and actuators in machines and new being objects. IoT is identified to exchange to the lead quickly on the summit of the coming years and this convergence will unleash the different dimension of offerings that add happening the placing of the vibrancy of customers and productiveness of enterprises, unlocking an chance that the GSMA refers to as the Connected Life.

- For consumers, the IoT has the potential to attend to solutions that dramatically add together cartoon efficiency, security, health, education, and many substitute aspects of the daily moving picture.
- For enterprises, IoT can underpin solutions that fix decision-making and productivity in manufacturing, retail, agriculture, and added sectors

3.1.1.The Internet of Things Phenomenon

The Internet of Things is majorly helping in a societal revolution: anything and everything can now be connected. While industrial applications like remote management and monitoring have been present in manufacturing for decades (General Electric, in particular, has over the years developed some standards for industrial uses), the consumer-oriented IoT is a new phenomenon, enabled by the miniaturization of devices, the emergence of the internet as a favored communications method and the proliferation of powerful and smart mobile devices.

The internet of things is made possible by what Alain L89+ouchez, managing director of Georgia Tech's Center for the development and Application of Internet of Things Technologies (CDAIT), calls internet of things as "DNA:" given as

Devices: with miniaturization of sensors and captors

Network: through radio signal, wireless Internet, etc.

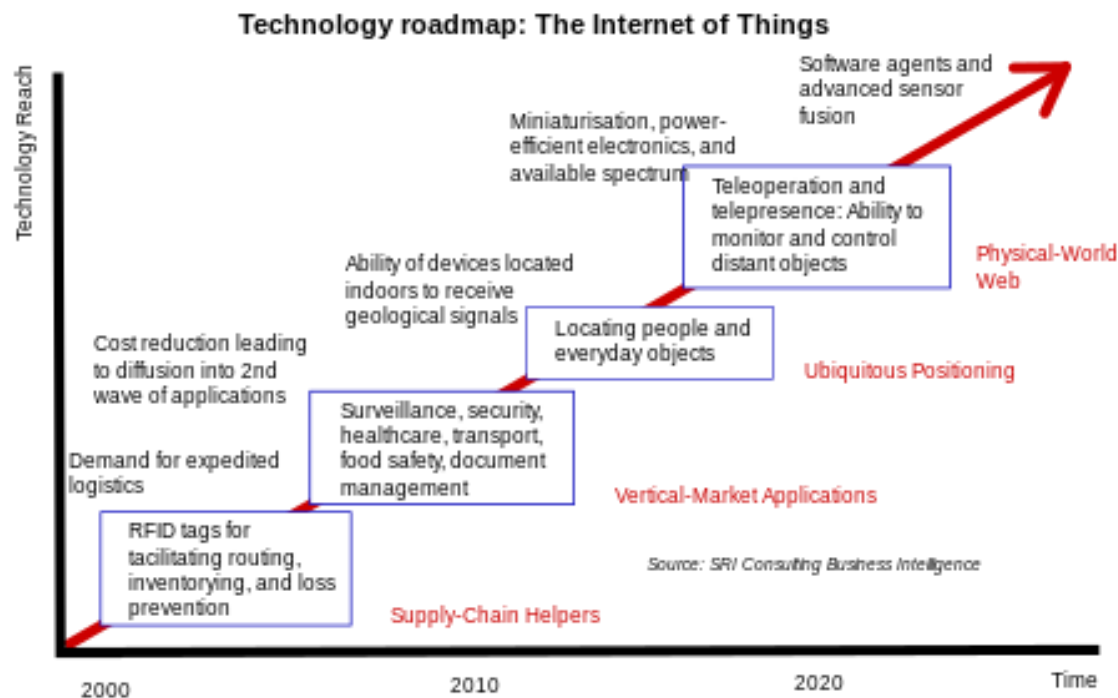


Fig: 1– Technology Roadmap of Internet of Things

3.2 .Machine Learning (ML):

Machine learning (ML) is the study of computer algorithms that improve automatically through experience.[1] It is seen as a subset of artificial intelligence. Machine learning algorithms build a mathematical model based on sample data, known as "training data", to make predictions or decisions without being explicitly programmed to do so. Machine learning algorithms are used in a wide variety of applications, such as email filtering and computer vision, where it is difficult or infeasible to develop conventional algorithms to perform the needed tasks.

3.2.1Regression:

Regression is an ML algorithm that can be trained to predict real numbered outputs; like temperature, stock price, etc. Regression is based on a hypothesis that can be linear, quadratic, polynomial, non-linear, etc. The speculation is a characteristic primarily based on some hidden parameters and enter values. In the training phase, the hidden parameters are optimized w.r.t. the enter values introduced in the training. The manner that does the optimization is the gradient descent algorithm.

3.2.2 Linear Regression:

Linear Regression is a machine learning algorithm based on supervised learning. It performs a regression task. Regression models a target prediction value based on independent variables. It is mostly used for finding out the relationship between variables and forecasting. Different regression models vary primarily based on – the form of relationship between biased and unbiased variables, they are thinking about and the quantity of unbiased variables being used.

5.Importance of Design

In software there are several ways to approach a model. The two most common ways are algorithmic perspective and an object-oriented perspective. The contemporary view of software development takes an object-oriented perspective in this approach, the main building block of all software system is object or class. Every object has identity, state and behaviour

5.1.Principles of Modeling:

- The use of modeling has a rich in all engineering disciplines. That experience suggests four basic principles of modeling they are;
- The choice of what models to create has a profound influence on how a problem is attacked and how a solution is shaped
- Every model will be expressed at different levels of precision
- The best models are connected to reality
- No single model is sufficient. Every non trivial system is best approach through a small set of nearly independent models

5.2.Block Diagram:

There are four functional components in this project. They are, fingerprint sensor, GPS module, GSM module and self defence equipment. Thus, the Arduino Board is programmed using the Arduino IDE software. The function of the GPS module is to track the location of the victim. And the GSM module contains the emergency contacts. This project uses microcontroller Arduino Uno board to controls Fingerprint, GPS and GSM modules. Follow the schematic to connect the Arduino to the sensors and modules. The Uno board can be driven by a 5-volt battery, we can also supply power from external source or from Arduino board. The Arduino Board is programmed using the Arduino IDE software.

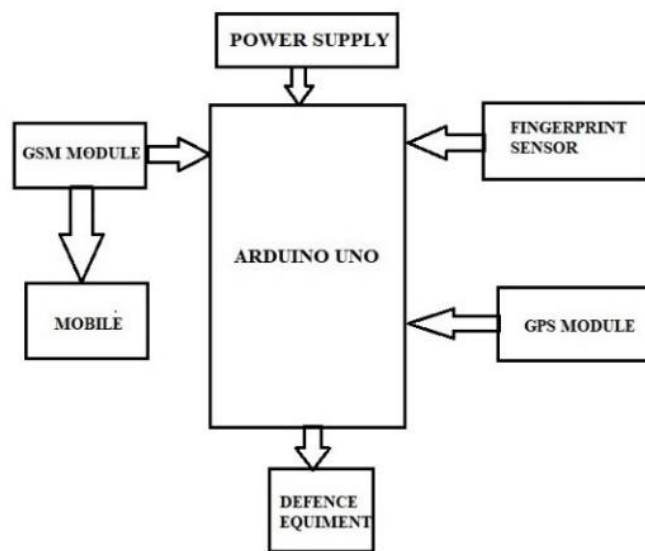
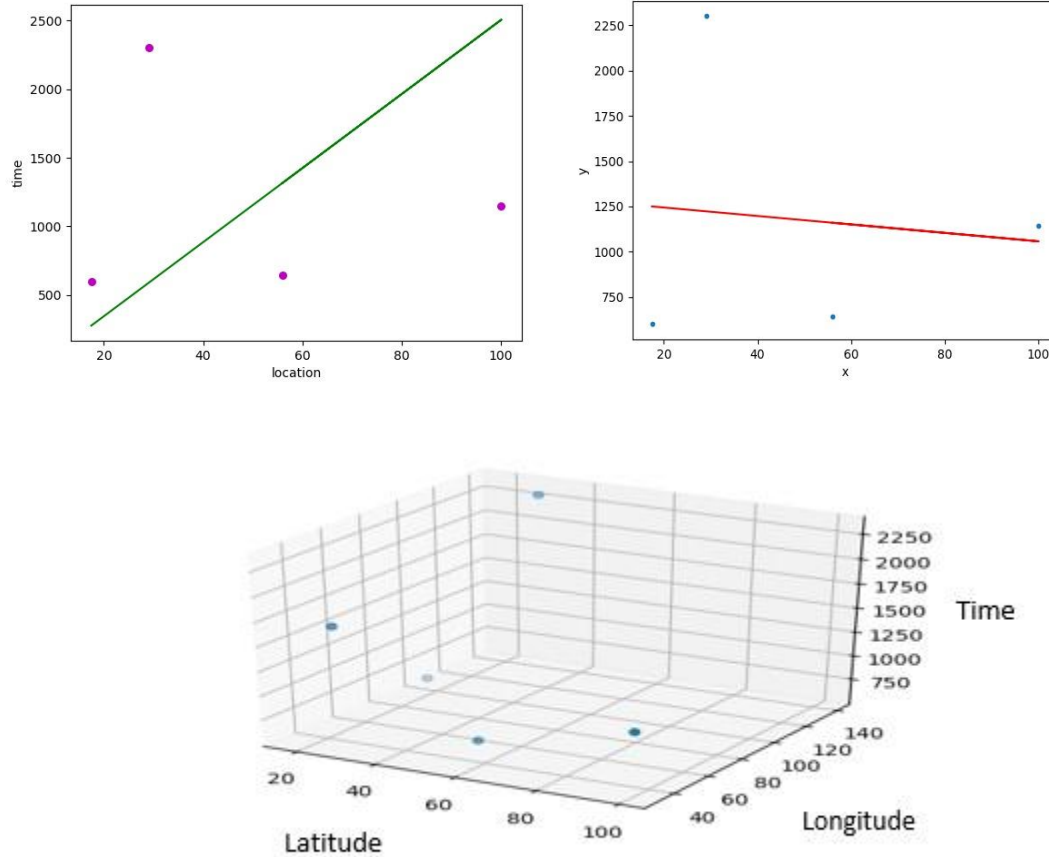


Fig.2 Block diagram

6.Results:

The main purpose of the work is to provide safety and security to the people in danger situation. The button is pressed by a his/her when they feel insecure. Once the button is ON, the microcontroller gets the commands and the GPS will calculate the current latitude and longitude values of the them. GSM module will send SMS which contains latitude and longitude values to the numbers already stored in the microcontroller and nearby police station. GSM will send SMS to the registered mobile numbers for the time-lapse. So that nearby police may come to know that someone is in danger and they will come to rescue. The microcontroller also turns ON the self-defense equipment to get rid of the attacker.



7.Conclusion

This type of an idea being the first of its kind plays a crucial role towards ensuring Women Safety in the fastest way possible automatically. The proposed design will deal with critical issues faced by women in the recent past and will help solve them through technologically sound gadgets. With further research and innovation, this project can be implemented in different areas of security and surveillance. The system can perform the real time monitoring of desired area and detect the violence with a good accuracy. The project mainly focuses on the low-cost implementation of the device which can save the life of the women in the critical condition the proposed system provides end to end security solutions for women safety using the advance technologies of IoT and Machine Learning algorithms. The overall system is first of its kind that provides a complete kit solution to the existing women safety problem, with the complete system

the women can now travel freely without any hesitations of getting harmed by the societal issues. The further research can be made to make the prototype version of our system into a consumer portable product.

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