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Smart Solution for Women Safety using Internet of Things

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ABSTRACT: Today in the current global scenario, the prime question in every girl's mind, considering the ever-rising increase of issues on women harassment in recent past is mostly about her safety and security. The only thought haunting every girl is when they will be able to move freely on the streets even in odd hours without worrying about their security. The project uses Arduino to provide a wearable safety gadget for ladies. If they encounter any danger, ladies will be protected by this gadget. The gadget employs wireless sensor networks to interact with other devices and provide warnings to them. The user's position is shared immediately with the appropriate authorities and stored contacts via GPS. The gadget has a switch that may be used to manually transmit notifications in an emergency or as a shock switch, activating the buzzer and laser light. Women in today's society are up against a myriad of challenges regarding their safety. The application that is being suggested has access to monitor position, and it will transmit notifications to neighbouring police stations as well as the phone numbers that are being scanned. This application is not only used for situations such as assaults and any perverts tormenting females, but it also helps them from any bad condition or any health problem like abruptly collapsing. For example, this application helps them from any bad condition. The victim's position can be tracked using GPS, and communications can be sent to the local police station along with the victim's relations' phone numbers. Additionally, the location of the victim can be sent to the nearby police station. This application assists women in overcoming their anxiety associated with getting out and engaging in activities that they enjoy.

KEYWORDS: *Q-Learning, machine learning, Internet of Things, Women Security, Body sensors, Arduino,*

I. INTRODUCTION

The Internet Of Things is the network of physical devices, home appliances and other items embedded with electronics, software, sensors, actuators, and network connectivity which enables these objects to connect and exchange data. Health is a dynamic process which needs to be continuously monitored. In our system we are measuring patient's parameters (MAX30100 Pulse Oximeter, temperature, pulse rate, blood pressure etc) different available sensors data. "Things" in the IOT sense can refer to a wide variety of devices. Women safety has always been an issue even in these modern times with so much advancement in technology. Women are not safe anywhere and are most vulnerable when traveling alone into lonely roads and deserted places Women safety is a very important issue due to rising crimes against women these days. To help resolve this issue, a GPS based women safety system is proposed that has dual security feature. This device consists of a system that ensures dual alerts in case a woman is harassed or she thinks she is in trouble.

The Internet of Things, also known as cloud computing and sensors, is a term that refers to the physical objects through which all technological devices are networked. The Internet of Things maintains a very high level of confidentiality. Developing a protection system that is smart-based can be of great assistance to individuals. Because of the way the instruments were designed and developed, there is an automated reaction even though there are no initiating controls. People who use this approach have a better chance of overcoming challenges such as ensuring the safety of women and building smart cities. For reasons relating to safety, a number of instruments, including GPS, vibration sensors, inclination sensors, heartbeat sensors, and flow sensors, are utilised. The position can be determined with the help of the Satellite. IoT is used to transmit the position and communication to neighboring police station if there is any significant change in the heartbeat level. A heartbeat monitor is used to determine the heartbeat level. If there is any form of intimidation, there is a possibility that there will be bending, inclinations, disturbance, and any bending will be detected by the tilt sensor. If there are different alterations than the message is sent, there will be bending. In the system that is being suggested, components such as Arduino and Raspberry pi3 are utilized.

II. LITERATURE SURVEY

Women are the most important part of a country's economy as they help to shape its future. Due to society's hypocritical attitude many crimes committed against them go unreported, victims who attempt to report the assaults experienced by them to the society are subjected to a slew of humiliations and abuse. Only one out of every four cases in India results in a conviction trial. Despite living in the twenty-first century and in an era of rapidly developing technology, young girls and women continue to feel insecure and face a variety of challenges and issues. By giving a voice, today's women are breaking down barriers and working in all fields. Men face tough competition and while women excel in their chosen fields proper precautions must be taken in order to develop the best solution to this problem this paper proposes an iot-based smart safety device for women and can be used to detect any such situations automatically and notify the appropriate parties it also helps women in danger but it also ensures that women receive justice by assisting them when they are in need.

In Ghosh, Prottasha, et al [1] a new Internet-of-Things-based evidence-gathering gadget to safeguard the safety and security of women This system combines a Raspberry Pi, buzzer, and camera, as well as flex sensor, GSM, and GPS modules. Women may simply and comfortably use this little gadget with their underwear.

In Hyndavi, V., N. Sai Nikhita [2] a smart gadget for women's protection is presented that automates the emergency alarm system by utilising pressure, pulse-rate, and temperature sensors to automatically identify a prospective atrocity via outlier detection.

In Kabir, AZM Tahmidul [3] Women's movement may be made safer with the help of an IoT gadget and an Android app. By hitting the device's emergency button, women may get immediate and comprehensive safety assistance. In the event of an issue, this gadget can monitor the user's position in real time and relay it to a local police station and volunteer. This gadget may also provide the user with the location of the closest safe zone. Arduino nano, GPS, GSM, Bluetooth, and other components make up the gadget.

In Akram, Wasim[4] an IoT-based safety gadget that depends on fingerprint-based connection to the device to provide protection to women while also notifying local individuals and authorities when a woman is not secure. Fingerprint verification detects a dangerous condition for a minute, then immediately alerts surrounding individuals and authorities if the gadget detects no signal. Furthermore, a shockwave generator has been built for first-hand safety so that ladies may fight the attacker. The suggested design also includes additional functionality such as sending group messages and audio recording.

In Sunehra, Dhiraj[5] an IoT-based safety gadget that depends on fingerprint-based connection to the device to provide protection to women while also notifying local individuals and authorities when a woman is not secure. Fingerprint verification detects a dangerous condition for a minute, then immediately alerts surrounding individuals and authorities if the gadget detects no signal. Furthermore, a shockwave generator has been built for first-hand safety so that ladies may fight the attacker. The suggested design also includes additional functionality such as sending group messages and audio recording.

In Mohd Ashraf et. al. [6] Researchers suggested using the Deep Neural Network technology to develop an automated system for predicting heart attacks. Multiple datasets were used to evaluate ML algorithms for accuracy. The proposed solution used an automated data preparation strategy to eliminate abnormalities from the system.

Sumit Sharma and Mahesh Parmar [7] introduced the Talos Hyper-parameter optimization framework for cardiac and heart disease prediction. Heart illness is an important area where Deep Neural Networks may help improve overall heart classification consistency. SVM, Nave Bayes, and Random Forest all fared differently regarding classification. The Talos High energy Optimization outperformed the other classification algorithms in the UCI heart attack Dataset.

In Asma Baccouche et. al. [8] proposed an ensemble-learning framework based on unidirectional and bidirectional BiLSTM or BiGRU model with a CNN and achieved the accuracy of 91% for different types of heart disease. A data preprocessing with feature selection is implemented to improve the classifier performance.

Researchers in N. Sowri Raja Pillai et al. [9] employed a learning algorithm strategy for improvement goals outcome using patient diagnostic narratives using based on deep neural networks (RNNs), i.e. (PPRNN). Multiple RNNs are

used in the hypothesized PP-RNN to learn from patient diagnostic code combinations in order to forecast the incidence of high-risk illnesses. Finally, the suggested strategy improved accuracy.

A new Cloud and IoT-based Medical application has been created by M. Ganesan and Dr. N. Sivakumar [10] to monitor and detect critical disorders. The svm classifier is trained employing data from the validation set during the training phase. During the system testing, real patient records was utilised to detect illness and the presence of disease.

III. PROPOSED SYSTEM DESIGN

The Internet of Things is the network of physical devices, home appliances and other items embedded with electronics, software, sensors, actuators, and network connectivity which enable these objects to connect and exchange data. Health is a dynamic process which needs to be continuously monitored. In our system we are measuring patient’s parameters (MAX30100 Pulse Oximeter, temperature, pulse rate, blood pressure etc) different available sensors data. —Things|| in the IOT sense can refer to a wide variety of devices. Women safety has always been an issue even in these modern times with so much advancement in technology. Women are not safe anywhere and are most vulnerable when traveling alone into lonely roads and deserted places Women safety is a very important issue due to rising crimes against women these days. To help resolve this issue, a GPS based women safety system is proposed that has dual security feature. This device consists of a system that ensures dual alerts in case a woman is harassed or she thinks she is in trouble.

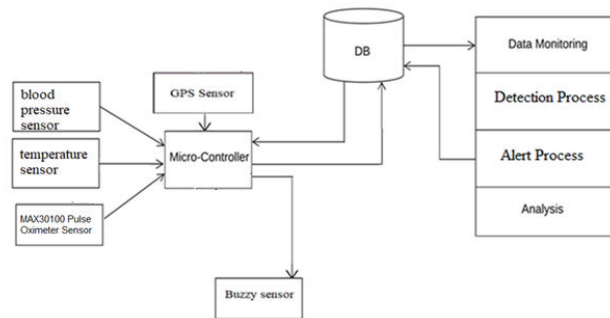


Figure 1: System Block Diagram

The proposed system is collaboration of various modules such as IoT modules, database modules and GUI modules. In below section we described each module in detail

Two phases: training and testing.

1) Training:

- Collect IOT environment data.
- Apply data mining approaches.
- Data is been saved into the database called as background knowledge, which is used at the time of testing.

2) Testing:

- The system produces the IoT-based healthcare system environment
- All collected data is stored into database using connection oriented architecture.
- In testing we read all testing as well as training data simultaneously.
- Apply detection the possible using decision making system.
- Using IOT technology we can continuously monitor changes in sensors values
- GPS + GSM module is connected to Arduino UNO; this two Module collects the information and sends data to Arduino Uno.
- Buzzer is an audio signal device, which is used to buzz sound whenever it as needed.
- At last, a sms (short message service) or mail is sends to a phone

IV. ALGORITHM DESIGN

Q- Learning Algorithm

Input: inp[1...n] all input parameters which is generated by sensors, Threshold group TMin[1...n] and TMax[1...n] for all sensor, Desired Threshold Th.

Output: Trigger executed for output device as lable.

Step 1 : Read all records from database (R into DB)

Step 2: Parts [] ← Split(R)

Step 3:

$$CVal = \sum_{k=0}^n Parts[k]$$

Step 4: check (Cval with Respective threshold of TMin[1...n] and TMax[1...n])

Step 5: if (Cval > Threshold)

 Read all measure of for penalty TP and reward FN

Else continue. Tot++

Step 6: calculate penalty score = (TP *100 / Tot)

Step 7: if (score >= Th)

 Generate event

End for

V. ADVANTAGES

- Enhancing the controlling and observing components. Using less number of sensors with better outcomes.
- Reducing the application cost,
- It is safe and easy to use.
- It can be used by children, teenager girls, women, old lady Or old men.
- Saving energy.
- All the parameters are embedded in a single system which is easy to handle by a normal person.

VI. OBJECTIVES

- To study and various Safety Device system using IoT and detection techniques.
- To develop IoT model for woman Safety Device and GPS model for location detection
- To develop a functionality for automatic emergency message generation according to policy-based techniques
- To explore and analysis propose module with IoT and detection techniques

VII. RESULT

The implementation process was completed in a Java open-source setting. The device operates on the Java 3-tier analytics platform with a distributed INTEL 3.0 GHz i5 CPU and 4 GB RAM. We have performed experiment analysis on ensemble machine implementation to verify the outcomes.

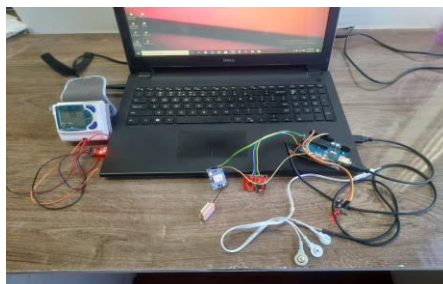


Figure 2: IOT System Connection



VIII. CONCLUSION

With the world being fast-paced, it has come to be smarter as well as scarier. Therefore, to feel a sense of security we have introduced this smart safety device. The prime objective of this is to provide security to people, significantly to women. This automated and manual working device is cost-effective and works in any critical situation. As soon as the sensors go above the threshold the gadget reacts sending the registered contacts an alarm message and pictures that were taken. With the pictures being captured and sent can be later used as proof to fight against the culprit in the courts. It has become possible to develop a wearable protection gadget for ladies that incorporate GPS as well as three different instruments. When there is a crisis, this could be of assistance to ladies. By monitoring their position, the GPS will automatically transmit a notification to the nearest police station as well as to any relations it detects. It's possible that this will make it easier for women to travel easily wherever they want. The vast growth of information technology leads to the invention of many IOT based devices and application are available to ensure the security of women in the society by providing automatic sensing of threats and automated messages to the relatives or to the police station.

Future Work

With the world being fast-paced, it has come to be smarter as well as scarier. Therefore, to feel a sense of security we have introduced this smart safety device. The prime objective of this is to provide security to people, significantly to women. This automated and manual working device is cost-effective and works in any critical situation. As soon as the sensors go above the threshold the gadget reacts sending the registered contacts an alarm message and pictures that were taken. With the pictures being captured and sent can be later used as proof to fight against the culprit in the courts.

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