Sustainable Energy Algorithm for Women Tracking Based On Iterative Minimization and Detection Techniques

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ABSTRACT
The problems that women and children encounter in their daily lives are more numerous. Basically, there are several problems while going outdoors and coming back, including kidnapping. The most pressing issue facing our nation is the prevalence of crime against women, which has an impact on socioeconomic status, women's development, and public safety. According to the crucial scenario, the primary cause of the high crime rate scenario is brutality towards women. The government works to improve the quality of life for citizens and decrease crime in order to combat the issue against women. Even with the development of applications and other forms of contact information, the rate of crime against women continues to rise. This issue is considered to be a major one in our day and age: Eventually, the inference of crime rates at the stranger level is raised. Traditional methods for calculating the crime rates in a certain location. The battery sustainability algorithm used in the women's tracking system has been adjusted to use less power and manage battery power. Compared to the current DSR protocol agent, the suggested method greatly lowers consumption of power overhead and enhances message transmission between source and destination.
Keywords: Awake mode**,** Energy, Location tracking, Node-process, Security, Sleep mode

1) Introduction

In this day-to-day life nobody will know what will happen to them next, and life predictions are not made by humans. Taking precautions to keep incidents or accidents from happening is the only way to address common issues that women face that aren't acknowledged. Women are parents' top concerns, particularly when it comes to their children's safety after they go out. Even though the parents have been caring for their daughter since birth, they are unable to keep an eye on them since they are too busy taking care of themselves to avoid family problems. Around the world, women tracking systems are often utilized to reassure parents that their children are safe from questionable activities, and their kids go to school or college without incident. It is crucial that they are safe and secure when venturing outside. There are occasionally cases of women being mistreated on college or school property, or even accidents that might have been easily avoided with a basic procedure in place. To get over these situations, little care is needed. Chained recovery against any loss or risk is the condition of safety and security.

The women are regarded as wonderful souls that add color and joy to everyone's lives. In the past, women were viewed as being on par with goodness in all households. Nowadays, every parent of a girl or woman worries about sending her out of the house, which is dangerous. Thus, a tracking system was created to reduce the anxiety and danger of leaving the house and returning home from college or school.

1.1) Women Safety process

The safety of women is becoming a concern for people everywhere. For women, the world is quite perilous. In the modern world, the majority of women leave their homes on many occasions for work-related purposes. Despite the introduction of numerous experts on women, sexual harassment, eve teasing, and kidnapping continue to occur in our nation. Crime against women has significantly grown in the past few years. Women are harassed during the day at home, at work, when shopping, and other places, not just at night or in the evening. For their own safety, a lot of women have been terrified of strangers. Approximately 93% of women in our nation are afraid for their safety.

Women who travel at night are more likely to be raped, kidnapped, or subjected to other forms of social harassment. Women today encounter extremely unsafe conditions, even during the day. To protect women's safety and security, tracking systems and gadgets meet each woman's demands by identifying the unsafe situation and informing the other end user of it. Women can overcome their critical position on the other side by sending an alert message to their guardian, parent's mobile number, or police control room number. Multiple moving zones made up of cars with comparable movement patterns make up the architecture below.

1.2) Network Zone Process for Moving

In this below Figure1, by taking into account the sender and destination points that differ, the movement of a vehicle from one of the traffic areas is calculated to achieve the resemblance of the car that abducted the women. The sender is a woman, and the destination is either the police control centre or the parents. To replicate the elements of vehicle movement, networks are positioned within a specific boundary. Woman tracking system is modulated with the vehicle using the simulator ns4 on the progress of moving process and illustrated as moving zone with captain as nodes with data link.

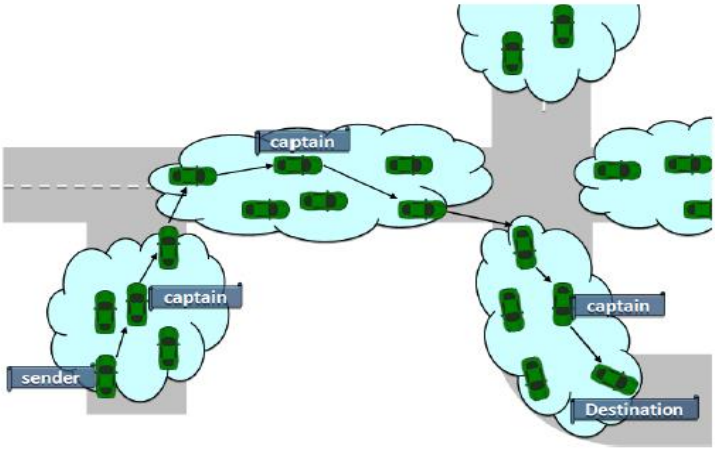

Figure. 1 Moving Zone location process

In the moving zone process that the woman is abducted, she will be transported by car to different locations; this moving zone of the process will assist in locating the woman through the source, server, and destination processes.

$$x(t) = x0 + v0 \cdot t + 1/2 \cdot a \cdot t2$$

Position of moving object directed from initial position x0 followed by initial velocity v0 multiplied with time T sum of the value with ½ multiplied by acceleration a and t2 specifies time.

1.3) Problem Analysis

Analysis of the issues women encounter is carried out in today's culture, but the outcomes are harsh. Abduction, rape, murder, sexual abuse, sexual harassment, and other forms of cruelty are among the more physical and psychological issues that women face in society. There is no upper age limit for this cruelty toward women, girls, or elderly women; the perpetrator claims that the crime is committed against women regardless of the female's age.

1.4) Problem Statement

Women being abducted

A review of a number of crimes was conducted in light of the rising ratio of crime against persons, and the researchers ultimately concluded that, in India, crime against women has significantly increased in comparison to all other crimes. Because it culminates in rape and murder, abduction is found to have a growing ratio in crimes against women.

Absence of tracking tools

Furthermore, tracking software are worthless if the kidnapper throws the phone or if the battery runs out.

2) Related Works

With the use of an ad hoc network that simulates different technologies through nodes, this proposed system offers a child tracking system that safeguards the kids. Many schoolchildren in Hiroshima City, all of whom are female, collaborate to do field study on safety and security measures for girls battling sexual abuse. A children's tracking system that is founded on the information and results of several trials conducted by young children [3]. These Android terminal-based child monitoring systems use a mobile application that comprises of Bluetooth devices with inter-network communication capabilities and wireless local area network devices to track the kids [11]. This procedure has illustrated the system needs for kids tracking system and outline the aspects of its implementation to meet the system's needs. In order to protect children from being abducted, a tracking system is finally started with early technological components [1].

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The proposed approach complies with dynamic use trends and offers precise demand projections by utilizing deep learning models, including neural networks and recurrent neural networks (RNNs). The research study illustrates the effectiveness of the deep learning-based technique with real-world case studies and complex simulations carried out in several smart cities worldwide [12] [10]. A study is conducted on several tracking systems for kids to observe the varied facets of individuals in various situations, such as kids monitoring on school buses, automobile tracking features, and other also examined in order to organize the new child tracking environment [2].

A concept for a women's tracking system that uses GPS and GSM was created. In an emergency situation of women the GPS will locate them, and the GSM will send an SMS to the police control center or parents with the location value [4]. In simulation processing, moving zone-related vehicle tracking is expected to monitor vehicles sequentially using GPS signals and ad hoc networks within a specific network bandwidth [5]. With the creation of movable wall boundaries based on mapping the relevant relativity in network message transit between nodes, a new configuration is projected onto the network simulation process [6]. The effectiveness of the proposed SOANN MPPT controller is verified by comparing it with PSOANN, RSANN, and GWOANN. With very little power fluctuation, extremely fast real-time global maximum (GM) tracking is achievable using a SOANN-based MPPT controller. Furthermore, an ingenious data-driven fault detection method is proposed, which eliminates the need for temperature or irradiance sensors and reduces system costs [15].

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This combination is intended to capture temporal dependencies, manage categorical variables, prevent overfitting, and handle the complexity of CKD data. This research model achieves 92% accuracy, 91% recall, and 93% precision, which is a significant improvement over the state-of-the-art models at the moment [16]. An all-time tracking and monitoring system for women in high-security scenarios is created using the MANET network protocol [7]. A tracking tool called m-tracker was created to follow women or children wherever they go and locate them in all of their difficult circumstances [8]. A feature of the tracking system is the ability to send messages based on information whereabouts of the women or children are known. The GSM module is used to process these messages [9]. Solar radiation with the minimum energy consumption, this is done while taking elevation and diurnal angles into account [14].

3) Proposed System

The suggested system uses sequential processing to follow women, and each time a woman leaves the house, she carries a tracking device. Using GPS modules, parents will track the woman throughout each stroll and notify them of the location's latitude and longitude. If a problem arises on the women's end, they will hit the emergency switch on the tracking device they are carrying. The message will notify parents of their daughter's emergency. After getting the missed call notice from the GPRS module and the message alert from the GSM module, the parents would take the proper action against the person who mistreats the women. This tracking device also focuses on women's health updates and uses a camera and speech circuit to monitor the clues that are enrolled around women. The network simulator is used to start other modules in this tracking.

3.1) Architecture Diagram

The scheduling of the user while the location tracking is being advanced and the sequential dropping/developing nodes are being scheduled with energy consumption is depicted in flow process figure 2 below.

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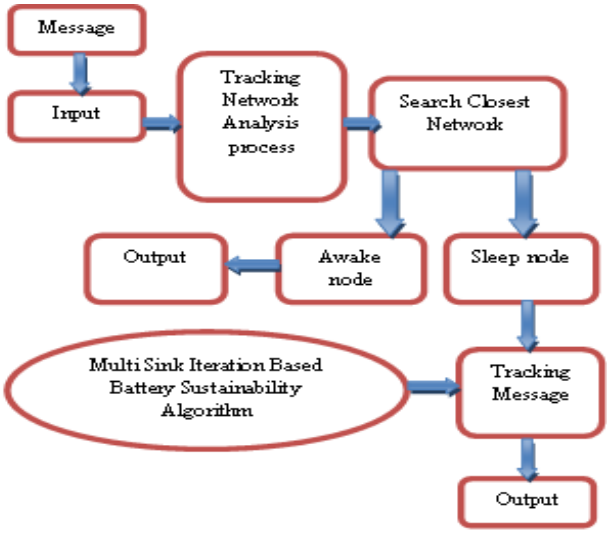

Figure 2 Architecture diagram

3.2) Process Of Inter-Flow

This process of inter-flow mechanism initializes the control of time in between sleep to awake node with the assistance nodes of communication and other. Tracking the position using a network simulator illustrates the location which travels from urban and rural using battery sustainability algorithm and the flow of battery levels in power when going to different regions during the abduction of women. To ascertain if the source has changed, the network in Figure 3 first examines the source after relocation.

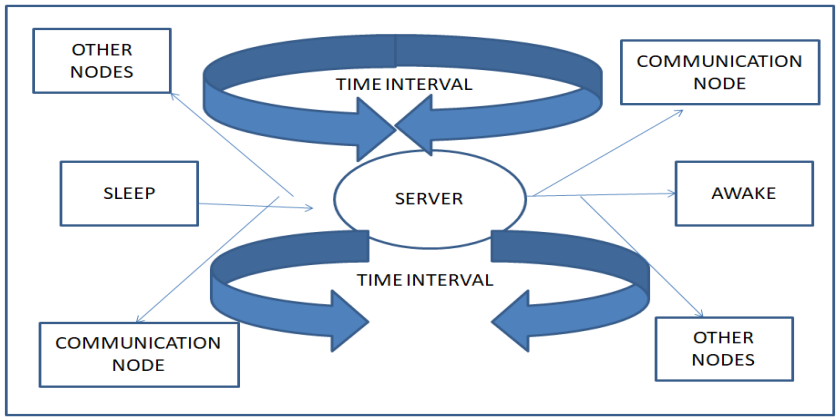

Figure 3 Process of Internal Flow

3.3) Working Process

- Simulation-based network tracking,
- Route discovery,
- Energy usage, and
- Outlier identification method

3.3.1) Tracking Network using Simulation

Packets of data are transmitted. The IP address is used to send these packets to their destination. The sender initially decides where the message will be sent and which nodes or routers will be used to deliver it. Between the source and the destination are these routers. The source

immediately connects to the nearest node or destination which is thought to be the closest police control room when it gets close to an urban or rural area. To protect women from harm, the notification is then sent to these control rooms.

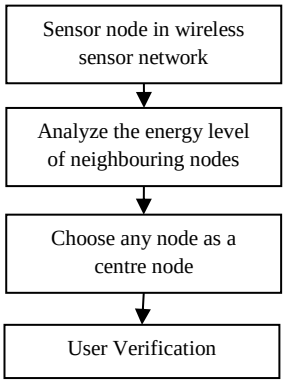

Figure 4 Network analysis process

Figure 4 shows how the network analysis process operates wirelessly using a sensor network that determines the centre node based on requirements after analysing the energy level with nearby nodes. Verification is then completed.The algorithms prioritize critical loads, consumption, use energy forecasting and balance energy generation techniques to regulate variations in renewable energy production using real-time data from IoT sensors and smart meters [13].

3.3.2) Route Discovery Process

The addresses with the highest preference are selected as evasion routers in addition to the outstanding addresses, and a default route is added to each one's kernel routing table. In order to confirm the destination, Figure 5 routers compare their own IP address with the one that was agreed upon by the source. The source and destination sockets will be compared to take decision. Source node has same features while communicating with thus of destination node and one among the node including the closest node, it states the best route or best path is discovered.

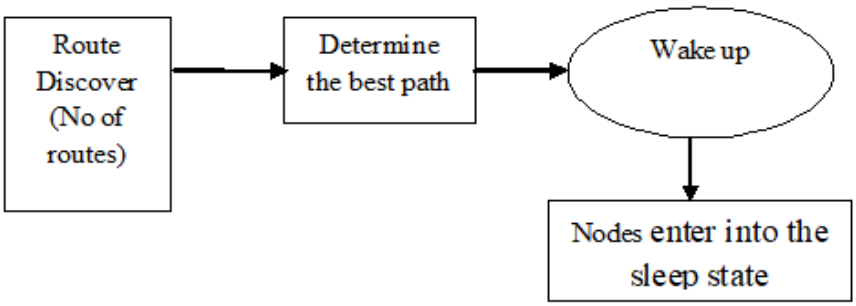

Figure 5 Route discovery process

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[13] Paramasivam, M., Palaniappan, S., & Devi, K. (2023). Whale optimization algorithm and internet of things for horizontal axis solar tracker-based load optimization. Indonesian Journal of Electrical Engineering and Computer Science, 32(3), 1278-1287.

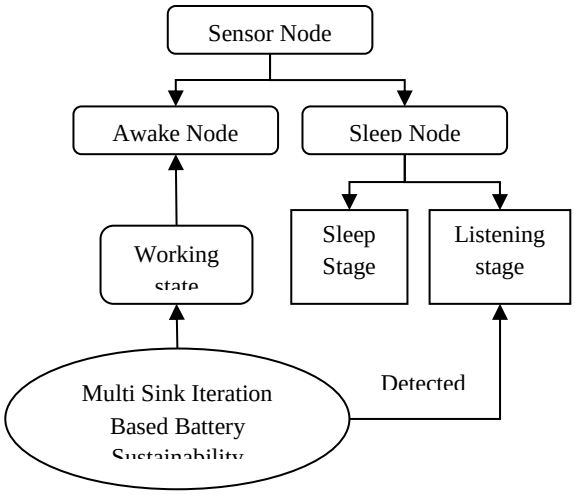

Figure 6 Tracking process

The sensor node in Figure 6 is referred to as a "tracking system." The awake and sleep nodes are two modules that are used to reduce battery power usage. The sleep node will turn on when the node is not communicating. A node is considered awake when it communicates with other nodes or with a destination from its source.

3.3.3) Charging Cycle Energy

When the nodes are in the sleep module, this energy charging cycle cycles through the network simulation, providing charge each time. When the signal moves and the operational time is taken, the provided information about the source's location is conveyed effectively. The goal of this energy cycle is to minimize battery energy consumption and optimize the energy within each tracking system using a network simulator. The sleep module and the awake module are two distinct modules that are manipulated to accomplish this processing.

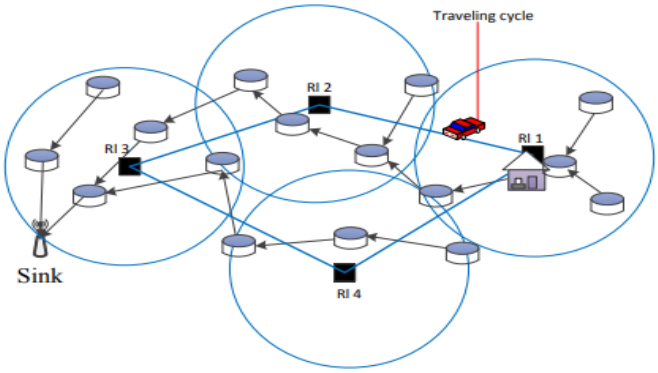

Figure 7 Energy Charging Cycle

Figure 7 modulates between energy charging cycle by inducing the routers from sink node to travel node using traveling cycle.

3.3.4) **Outlier detection process**

The main component of monitoring a woman utilizing position tracing on a network simulation that balances a specific boundary area within the network synchronization is distance calculation. Figure 8 shows the women's location, which is precisely recorded while using less power and simulating signal processing through the use of anti-jamming techniques in the tracking system.

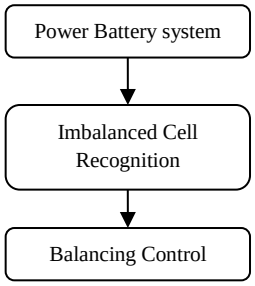

Figure 8 Outlier Detection process

3.3.5) Sustainability of Battery Process

Battery monitoring temperatures which handling electrical charging for cycles to extend their lifespan. Enhancing battery energy performance and developing a tracking system with higher energy operating limits. Improved position detection and energetic battery level accommodation on internal shorts. Table 1 calculates the node value, packet delivery value, and average delay value as a percentage.

Table 1 Delivery in Nodes & Packets Delay

Nodes	Average Delay (%)	Packet Delivery (%)
40	2.12	97.57
50	4.02	91.39
60	5.34	86.10
70	8.67	82.40
80	13.94	75.65
90	19.4	68.76
100	25.49	63.41

4) Results & Discussion

According to the Battery Sustainability method, certain women are identified one after the other without any battery power outages or geographical manipulation. In a random sleep/awake cycle, power usage decreases from maximum to minimum.

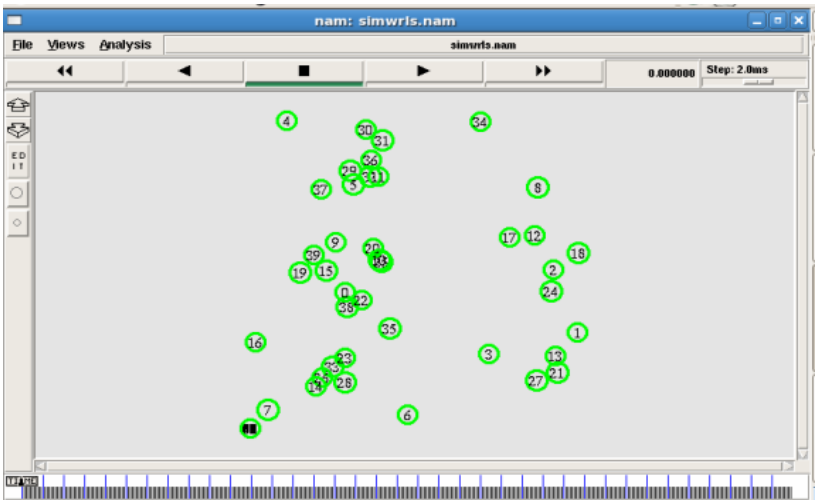

Figure 9 Nodes Synchronization of each packet

Figure 10 shows several nodes connected to the server; each node is shown as green, while the server is evaluated as black, representing node 0. Sequential tracking nodes are identified by their orange source and destination nodes. Before starting the battery sustainability process, battery power consumption was very high. The blue line shows the current battery power consumption, while the red line shows battery utilization of current system.

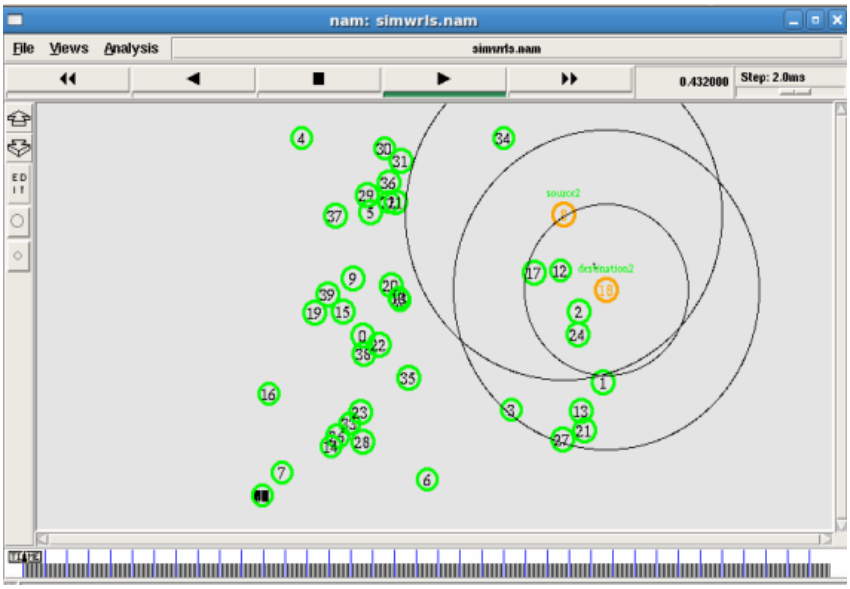

Figure 10 source and destination routing via ns2 simulator

By designating distinct colour forms to the marking values—red for the existing value and green for the proposed value—Figure 11 below compares the values of the current and proposed systems.

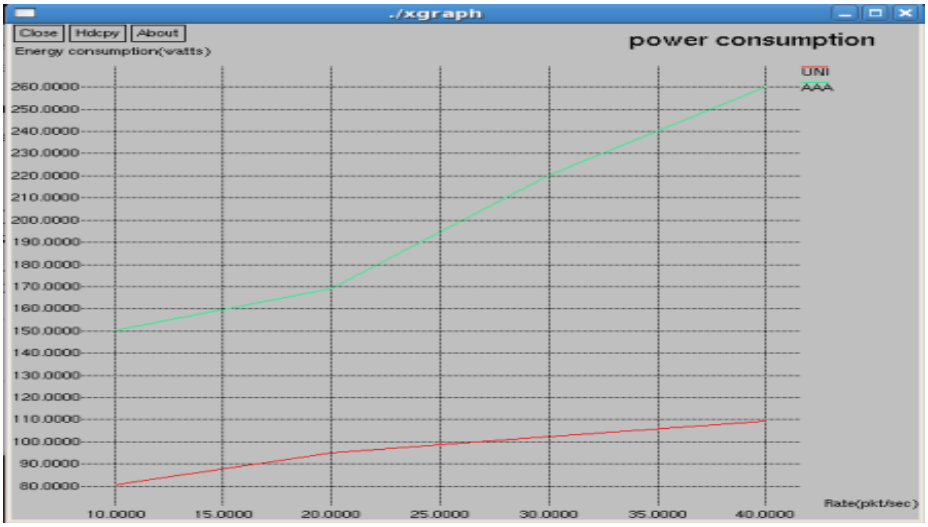

Figure 11 Battery Sustainability - per second

Through node synchronization of sleep and waking modes, the battery sustainability algorithm lowers energy consumption. By using an NS2 simulator to route the source and destination locations, battery durability is boosted.

•Commence the tracking procedure by sequentially moving to the location where the women were abducted and then continuing on.
•Routing would require more battery energy while moving over large distances.
•Certain unique characteristics must be implemented in order to lower the energy.
•Change the node to the sleep and awake nodes to synchronize the power manipulation.
•Both operations are carried out within a sequential time gap.
•Keep saving more battery power to extend the battery's lifespan.

Figure 12 Battery sustainability algorithm- Nodes

In Figure 12, the red line shows the battery power of the existing algorithm, and the blue line shows the suggested algorithm with the greater battery power once our suggested approach has been launched. When the network simulator's algorithm was launched, the battery's power increased.

5) Conclusion

Crimes against them have escalated in the modern period due to kidnapping, sexual abuse, sexual harassment, and other cruelties. Furthermore, even though the crime rate for women has not yet dropped, the majority of women are safeguarded by their parents through surveillance systems and other safeguards. This tracking modification identifies the issue and offers the ideal remedy for location trapping and low energy consumption. In order to keep up with this progress, a tracking gadget that is an integrated personal security system for emergency situations and useful for women in criminal incidents has been designed. The issue of women going missing and rape cases against women can be lessened by the women's proposed system. This monitoring system offers three-way to track women First, by employing a tracking system or tracking device; second, by employing location trapping in a serial fashion, which uses GPS to track the whereabouts of the lady outdoors; and third, by utilizing battery sustainability to lower energy use. This technique reduces battery energy consumption over extended running distances.