



RAKSHA VALAYA, A SMART BRACELET FOR SELF SECURITY

T. BALA BHARATHI, P. SUMATHI, P. LAKSHMIKANTH YASHWANTH,

K. ANITHA, K. NEELIMA

under the guidance of Mrs.D Haritha

Computer Science and Engineering

Visakha Institute of Engineering and Technology

Visakhapatnam

Abstract

The "Raksha Valaya" project aims to develop a wearable device designed to enhance personal safety, particularly for women. This smart bracelet integrates latest technologies Embedded C, Bluetooth technology, GPS technology, capacitor touch technology to monitor the user's physiological signals and environmental conditions, enabling real-time detection of distress situations. Upon detecting potential danger, the device can automatically alert nearby individuals, notify predefined emergency contacts, and share the user's precise location with authorities to facilitate swift assistance. By leveraging Internet of Things (IoT)

capabilities, the security bangle offers a proactive approach to personal security, empowering individuals to navigate their environments with increased confidence and safety.

Introduction

In the recent years many incidents of women harassment, rapes, kidnapping and molestation are increasing. Most of times, culprits capture the victim in the remote or isolated area which leaves the victim no option for self defense. It is quite clear that there is a determined need for women security in the country. It is now possible to intelligently apply the benefits of latest technology to resolve societal issues. There

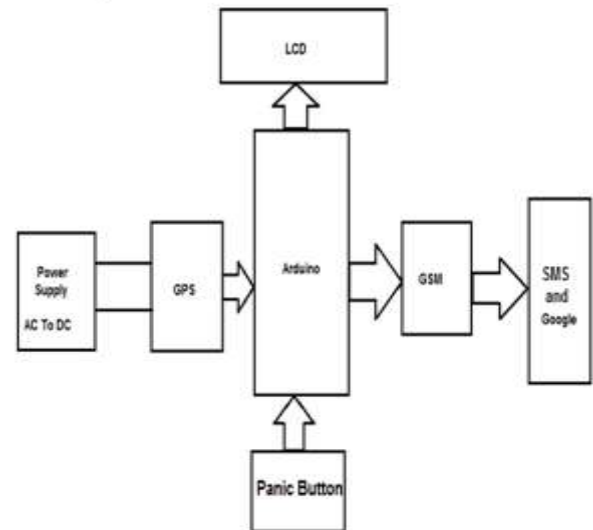
is need of application of current trend in technology, i.e., Internet of that are accessible through the internet.

Additionally, we can combine the benefits of the different technologies to provide mechanisms for women to report incidents of online harassment and abuse. Apps and devices that allow women to quickly and easily alert others if they feel threatened or unsafe can be a powerful tool. Various smart devices such as smart watches, mobile applications android applications has been presented for women empowerment.

In this paper, master and slave based wearable device called the “**Smart bracelet for self security**” in the remote area or crowded area. The main objective of our system is to send an instant location and a help message through an GSM to the top 5 emergency contacts. If it is connected to sos, improper incidents could be prevented. And it helps to provide real time evidence for quick action against the perpetrators of the crime.

Methodology

Block Diagram:



1.Wearing the Bracelet: The user wears the smart bracelet on their wrist like a traditional wristband or bracelet. It should fit comfortably and securely to ensure proper functionality and user comfort.

2.Activating Emergency Mode: In case of emergency or threat, the user can activate the emergency alert system by pressing the dedicated button or touch sensor on the bracelet. This triggers the GSM and GPS trackers to send distress signals and location information to predefined contacts or emergency services.

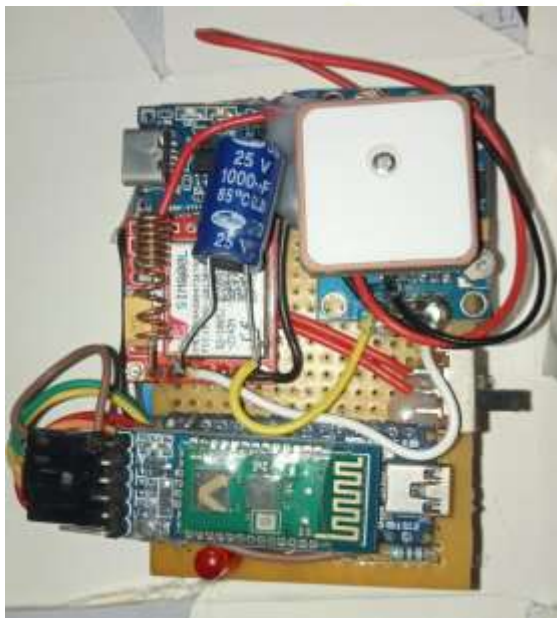
3.Charging the Bracelet: When the battery level is low, the user can recharge the smart bracelet using a compatible power source, such as a USB port or power adapter. The power bank module facilitates

convenient charging and ensures uninterrupted operation of the device.

4. Interacting with the Companion App:

Users can install and use a companion mobile application on their smartphone to configure settings, monitor the bangle's status, and receive alerts or notifications. The app provides a user-friendly interface for accessing and managing various functionalities of the smart bracelet.

Results



1. Core Components:

Microcontroller (e.g., Arduino Nano, ESP32)

GPS Module – for real-time location tracking

GSM Module – to send SMS or make calls

Panic Button / Touch Sensor – to trigger emergency mode

Battery + Charging Module

Optional: Microphone, speaker, buzzer, accelerometer (for fall detection)

2. Functionality Flow:

Normal Mode: The device stays in low-power mode, just monitoring for an input trigger.

Emergency Trigger:

When the wearer presses the panic button or long-presses a touch-sensitive area.

Optionally, sudden motion (like falling or being pulled) could also activate it.

Alert Mode:

Sends GPS location to predefined contacts via SMS or app.

May emit a loud buzzer sound to alert nearby people.

Can call emergency services or a trusted contact automatically.

Tracking: The device can periodically update location to a server or mobile app.

Possible Additions:

Bluetooth connection to phone

Voice activation

Camera or sound recording

Health monitoring features (for elderly)

Location Tracking:

Integrated GPS modules provide real-time location data, enabling responders to locate the user quickly. This feature is crucial for prompt assistance.

Communication Modules:

The bracelet may incorporate GSM/GPRS modules to facilitate communication over mobile networks, allowing alerts and location information to be transmitted effectively.

Power Management:

Efficient power management is vital to ensure the device remains operational when needed. This involves optimizing sensor usage and communication modules to conserve battery life.

Design Considerations:

The bracelet is designed to be compact, lightweight, and comfortable for continuous wear. Durability and water resistance are also important factors to enhance reliability.

By integrating these components and functionalities, a safety bracelet can provide users with a reliable means of seeking help and ensuring their security in emergency situations.

Our project demonstrates the potential of wearable technology in enhancing personal



Performance Analysis

Developing a Raksha Valaya involves integrating various components to ensure personal security. Here's an overview of how such a device typically operates:

Activation Mechanism:

The bracelet is equipped with an activation feature, such as a button or sensor, that the user can engage during emergencies.

Alert System:

Upon activation, the device triggers an alert system. This may include sending distress signals to predefined contacts or emergency services. For instance, some devices use GSM modules to send messages with the user's location.

safety by providing real-time alerts, location tracking, and immediate communication with emergency contacts and authorities.

Conclusions

The Rakha Valaya project represents a significant advancement in wearable technology, offering a comprehensive solution to address the diverse needs of modern-day users. By combining advanced features such as real-time location tracking, health monitoring, emergency communication, and seamless connectivity, the Smart Bracelet aims to enhance personal safety, health awareness, and digital interaction in everyday life.

The significance of the Smart Bracelet extends beyond its technological capabilities. It embodies a paradigm shift towards proactive personal safety and health management, empowering users to take control of their well-being in an increasingly complex and fast-paced world. By providing real-time tracking, emergency assistance, and health monitoring features, the Smart Bracelet offers peace of mind and reassurance to users and their loved ones.

Moreover, the Smart Bracelet connectivity features bridge the gap between the physical and digital worlds, allowing users

to stay connected, informed, and engaged wherever they go. With seamless integration with smartphones and other smart devices, the Smart Bracelet enables users to access notifications, messages, and alerts directly from their wrist, enhancing convenience and productivity.

Looking ahead, the Smart Bracelet project holds immense potential for further innovation and evolution. As technology continues to advance and user needs evolve, the Smart Bracelet can be continually refined and enhanced to offer new features, functionalities, and capabilities. Future iterations of the Smart Bracelet could incorporate artificial intelligence, predictive analytics, and advanced sensors to provide even greater insights into users' health and well-being.

In conclusion, the Rakha Valaya project is more than just a wearable device—it is a testament to the power of technology to transform lives and empower individuals to lead healthier, safer, and more connected lifestyles. With its innovative design, comprehensive features, and user-centric approach, the Smart Bracelet is poised to become an indispensable companion for individuals seeking to embrace the possibilities of the digital age while prioritizing their well-being and safety.

References

- 1."Safety Bracelet" by University of Illinois Students
- 2."SMART WRIST BAND FOR WOMEN SAFETY USING IOT" by N. Manasa, P. Lakshmi Nithya, V. Yamini, B. Harshitha
- 3."Wireless Personal Safety Bracelet" by Researchers at Cite Seer X
- 4."IoT Based Smart Bracelet for Women Security" by Kishor Banga
- 5."Safe Bangle: A Guardian Angel for Women's Safety" by Ran Lab

