TEAM AJCE

HUMAN ELDERLY MONITORING SYSTEM

A WEARABLE DEVICE

PREPARED BY :

ROHAN P THOMAS

SHARON THOMAS

JISHIN BIJUMON GEORGE

JOEL JAMES

INDEX

LITERATURE SURVEY

Several studies have explored the use of microcontroller-based intelligent systems for safety monitoring, particularly in accident detection and emergency alert systems.

Kavya and Yaswanth developed a smart helmet using an Arduino and accelerometer for fall detection. While effective in sending alerts, the system lacked features such as alcohol detection and helmet-wear verification.

Sharma et al. (2020) introduced a GPS and GSM-based helmet system for accident alerts. However, it did not include safety-critical functions like checking for drunken riding or helmet compliance before ignition.

Another IoT-based system presented in 2021 integrated both gyroscope and accelerometer sensors for fall detection. Despite its advancements, it struggled to distinguish between minor and severe impacts, leading to false positives. Additionally, it lacked real-time alcohol sensing and mechanisms to disable the vehicle in unsafe conditions.

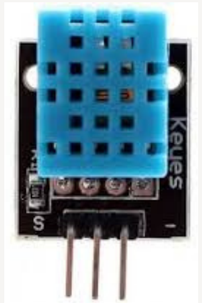
These limitations highlight the need for more comprehensive and reliable safety systems—a direction this elderly monitoring project aims to follow by integrating multi-sensor data fusion, real-time alerts, and environment-aware monitoring.

KEY COMPONENTS

ESP32

GPS MODULE

DHT11



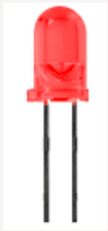
IR SENSOR

HEART RATE SENSOR-MAX30102

BUZZER

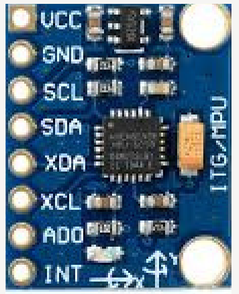
GSM MODULE

LED



LI-ION BATTERY

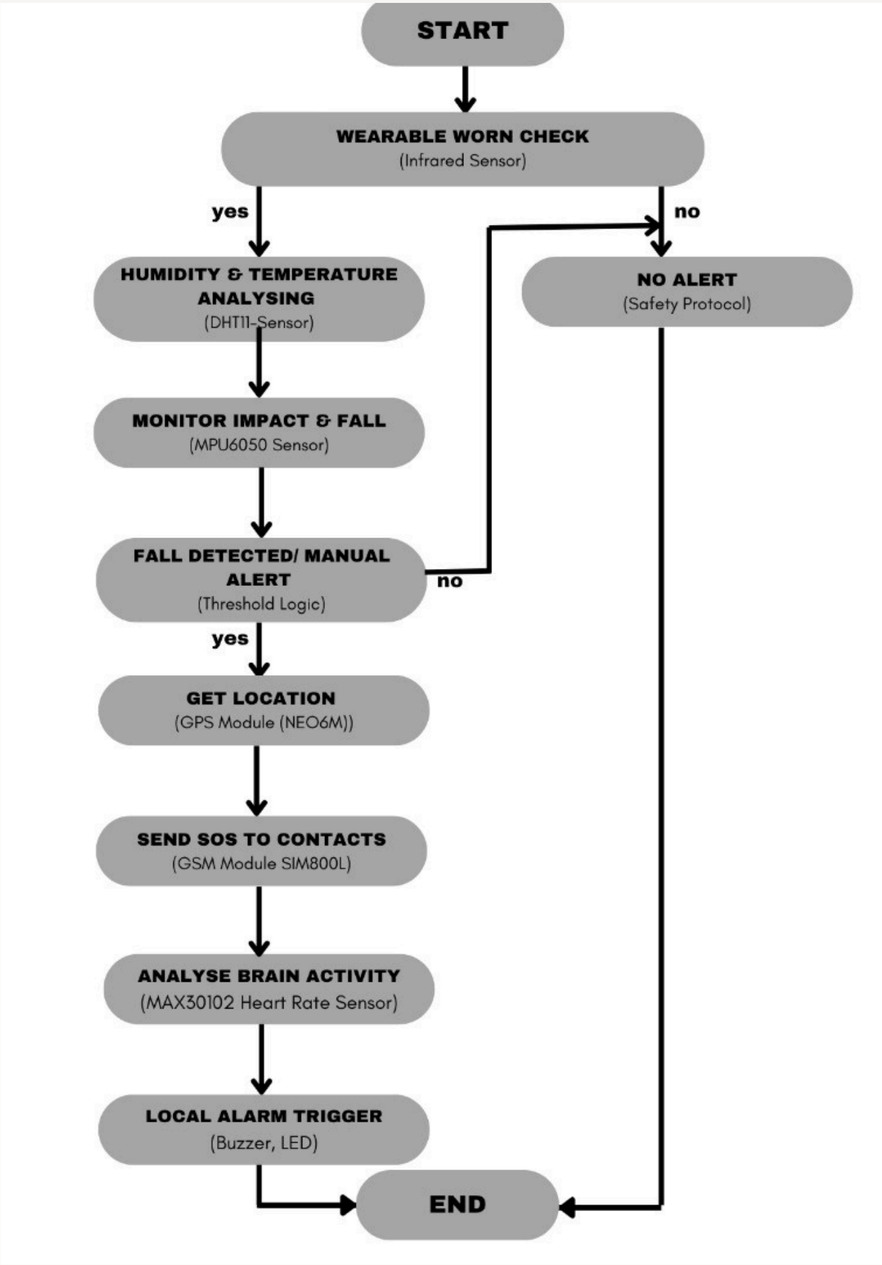
GYROSCOPESENSOR-MPU6050



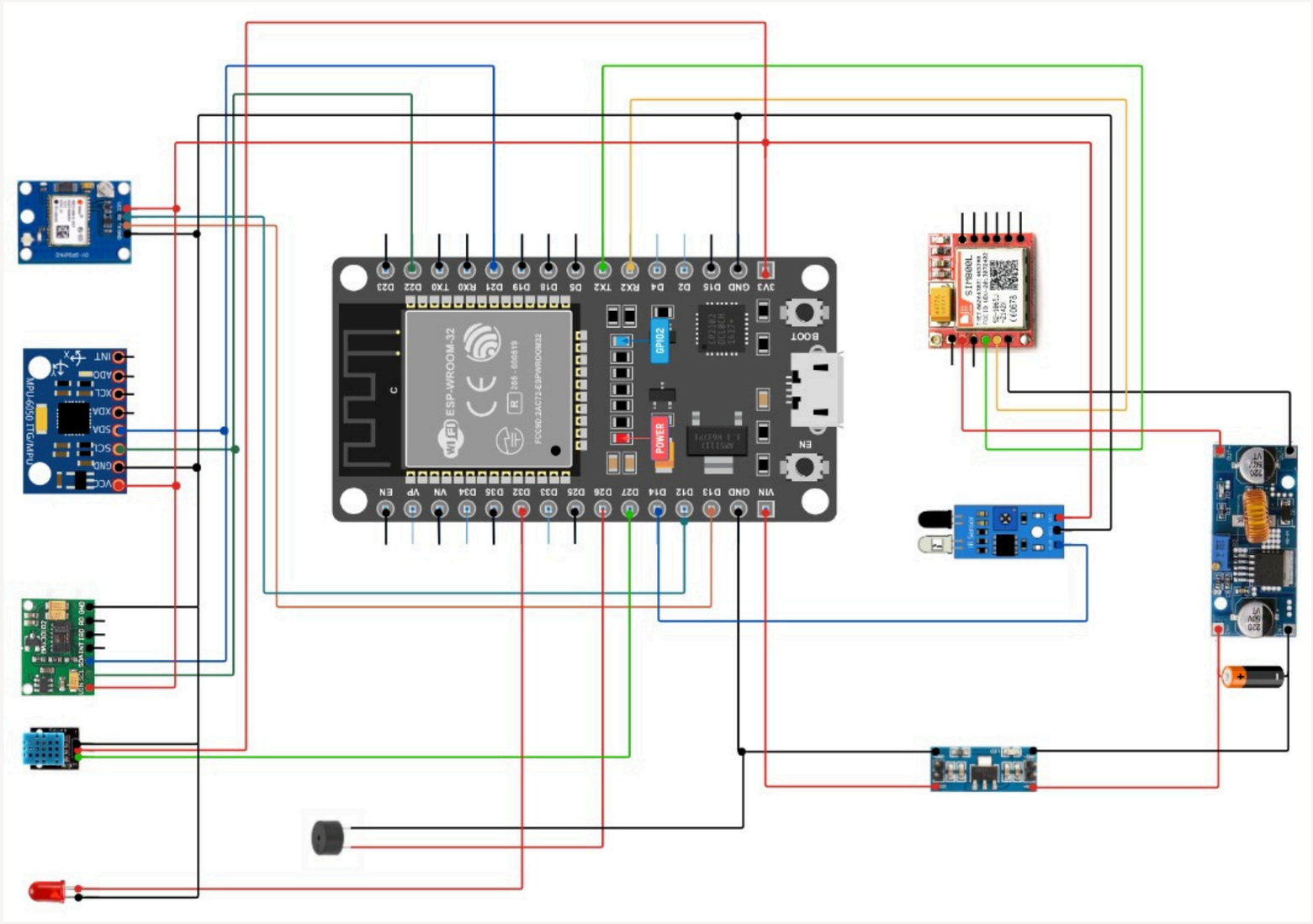
WORKING

The system continuously monitors the elderly person's health and environment using sensors like a pulse sensor, temperature sensor, and accelerometer. The ESP32 microcontroller processes this data and sends alerts via Wi-Fi to a caregiver's app or cloud platform in case of emergencies like a fall, high heart rate, or abnormal room conditions. It also consist of a buzzer and LED to provide local alerts.

BLOCK DIAGRAM



CIRCUIT DIAGRAM



EXPECTED IMPACT & BENEFITS

- **REAL-TIME EMERGENCY DETECTION**

Continuously monitors vital signs and movements to instantly detect falls, abnormal heart rate, or critical conditions.

- **INSTANT ALERTS TO CAREGIVERS**

Sends immediate notifications via app/SMS, ensuring timely assistance and reducing response time during emergencies.

- **SUPPORTS INDEPENDENT LIVING**

Enables elderly individuals to live safely on their own, promoting independence and reducing reliance on full-time caregivers.

- **REMOTE HEALTH MONITORING**

Allows family or healthcare providers to track health status from anywhere using cloud platforms or mobile apps.

- **COST-EFFECTIVE AND SCALABLE SOLUTION**

Built using affordable components like ESP32 and basic sensors, making it accessible and easy to expand with more features.

CONCLUSION

The Human Assistive System developed in this project provides a practical and reliable solution for monitoring the health and safety of elderly individuals. By integrating vital sensors with microcontroller-based technology and real-time alert mechanisms, the system enables immediate response to critical situations such as falls or abnormal health conditions. Its low-cost design, scalability, and potential for future enhancements make it a valuable contribution to modern healthcare solutions. With further development, this system can play a significant role in improving the quality of life for the elderly and reducing the burden on caregivers and healthcare facilities.

FUTURE SCOPE

- **AI-BASED HEALTH PREDICTION**

Use machine learning to analyze trends and predict medical emergencies like heart attacks or strokes in advance.

- **WEARABLE AND COMPACT DESIGN**

Miniaturize the system into a wearable device (e.g., smartwatch or pendant) for continuous and comfortable monitoring.

- **VOICE-CONTROLLED EMERGENCY SUPPORT**

Add voice recognition to let elderly users call for help using simple voice commands.

- **INTEGRATION WITH HOSPITALS AND EHR**

Connect system data with healthcare providers or electronic health records for remote diagnosis and treatment planning.

- **SMART HOME & IOT EXPANSION**

Integrate with smart home devices (like automated lights or emergency doors) to create a safer living environment.

REFERENCES

Websites :

Google

YouTube

Robu.in

GitHub

How2Electronics.com

AI Tools and Resource

ChatGpt,

DeepSeek,

BlackBox.AI

Perplexity.AI etc...

THANKYOU

TEAM AJCE

ANY QUERIES???