

IOT Monitoring for Elderly - Accurate, Reliable, and Easy!

Chandra Sekhar Challa, Udiptaman Das, Jaya Dhahran Merla, Harsha Vardhan Nadupalli,
Sai Pattapu, Komal Vanamala, Rohit Roy Yakkati, Kishore Yellu

Advisor: Dr. Sejun Song, University of Missouri – Kansas City

MOTIVATION:

Ensure elderly safety: An IoT-based system with ultrasonic sensors monitors elderly activities, promptly alerting caregivers or family members in emergencies, ensuring their safety and well-being.
Promote independence: By allowing independent daily activities, the system provides a safety net, enhancing elderly autonomy and quality of life while reducing caregiver burden.

CHALLENGES WITH CURRENT MONITORING SYSTEMS

- Ensuring accurate and reliable activity detection and recognition, while minimizing false alarms and improving the system's ability to adapt to individual differences in behavior.
- Building a cost efficient and easy-to-build model that is accessible to most of the people with ease and something that requires minimal effort to install/remove.

OUR SOLUTION USING ULTRASONIC SENSORS

- Ultrasonic sensors placed strategically within the home detect movement and activity, providing valuable insights into the daily routines of the elderly. The system sends alerts and notifications to caregivers or family members when there are significant deviations from the expected activity patterns, allowing for timely intervention if necessary.
- By analyzing the data collected from the ultrasonic sensors, the system can identify potential risks such as falls or prolonged inactivity, enabling proactive measures to ensure the safety and health of the elderly. This IoT solution promotes independent living for the elderly while providing an additional layer of support, fostering peace of mind for both the seniors and their caregivers.

ThingSpeak

ThingSpeak is an open-source Internet of Things (IoT) platform that enables the collection, visualization, analysis, and actuation of data streams in real-time from IoT devices. It provides an easy-to-use web interface and a RESTful API for developers to integrate their applications with the platform.

IFFTT

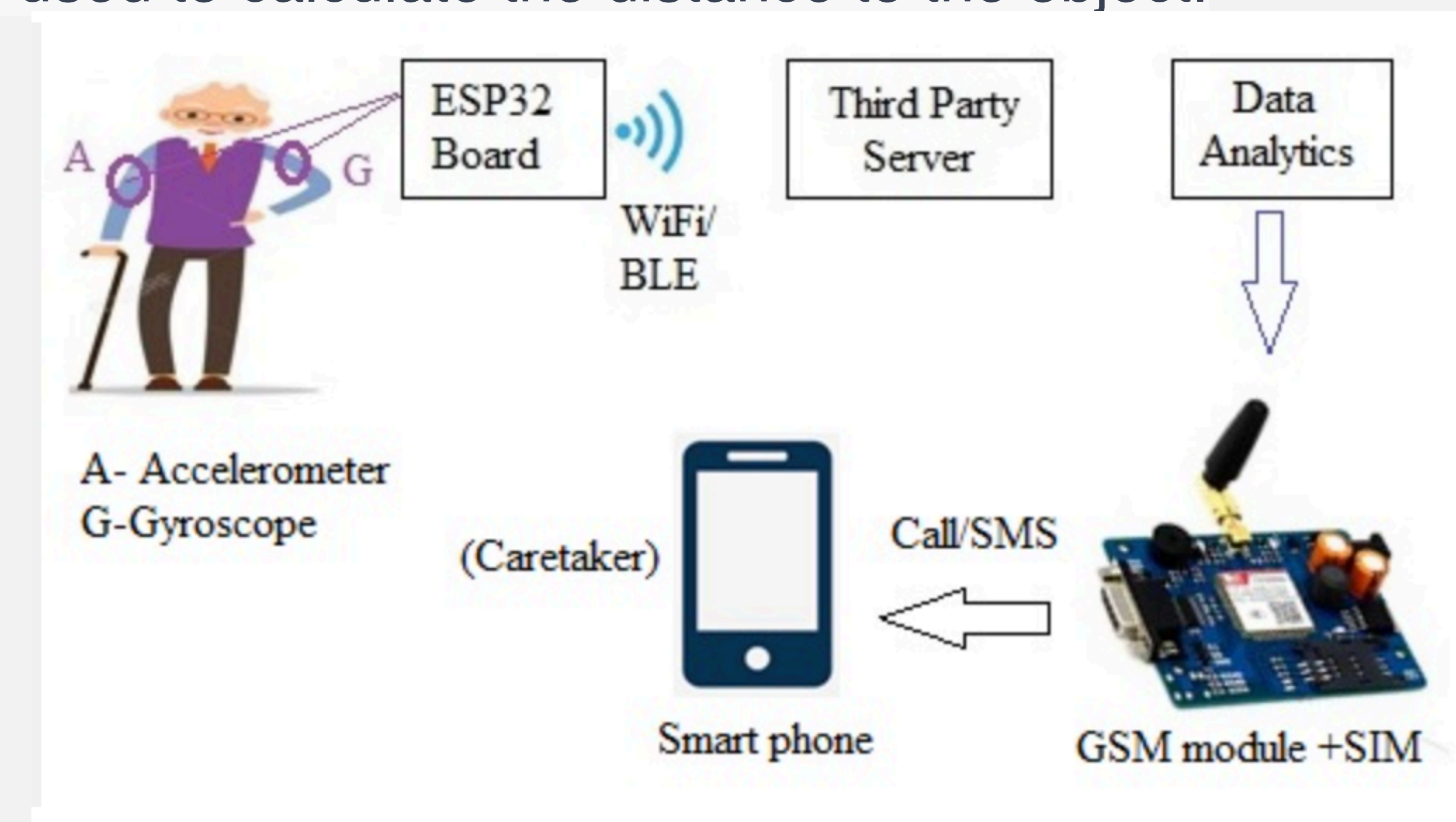
Here, we used IFFTT to get alerts to caregiver.

IFTTT (If This Then That) is a free web-based service that allows users to create chains of simple conditional statements, called applets, which are triggered based on changes to various web services and devices.

In other words, it lets you automate tasks between two different apps or devices based on specific conditions or triggers.

WORK FLOW

- The four ultrasonic sensors are placed in different areas of the room, such as the bed, the chair, the bathroom, and the door.
- The sensors emit high-frequency sound waves that bounce off objects in their path. These sound waves are then picked up by the sensors and used to calculate the distance to the object.



- The distance data from each of the sensors is then transmitted to a microcontroller or single-board computer, such as an Arduino or a Raspberry Pi.
- The microcontroller or single-board computer processes the distance data to determine whether there is a patient in the room and their location.
- If the system detects that there is a patient in the room, it can trigger other actions, such as turning on lights, adjusting the temperature, or sending alerts to caregivers.
- The system can also use machine learning algorithms to analyze the data over time and identify patterns or anomalies that may indicate changes in the patient's behavior or health.

CONCLUSION

The project is an example of an IoT-based monitoring system that utilizes ultrasonic sensors to detect the presence and movement of an elderly person.

It demonstrates the potential of technology in providing remote care and ensuring the safety of the elderly

Github Link:

<https://github.com/KishoreYellu/IOT.git>