



# St. Francis Institute of Technology

Department of Information Technology

Mini Project – Internet of Everything (ITL 702)

## Geotag- Advanced Security Device with GPS Tracking

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# Introduction

- IoE stands for Internet of Everything which is a concept related to Internet of Things (IoT). IoT is the interconnection of physical devices embedded with sensors, software and network allowing them to collect and exchange data.
- It aims to empower any individual and those in trouble while alerting others to the situation.
- Violence against any individuals is increasing due to their greater exposure across various aspects of life, posing a significant threat.
- The envisioned device promises increased safety, quicker response times, and the potential deterrence of offenders.
- Components used are : Neo-6M GPS module, MQ-2 gas sensor, NodeMCU ESP8266, Perforated Circuit Board

# Literature Review

Authors	Paper	Methodology	Gap Analysis
Shaista Khanam, Trupti Shah	Self Defense Device with GSM alert and GPS tracking with fingerprint verification for women safety.	The project critiqued current women's security solutions, proposing a portable baton-shaped device that integrates a GSM/GPS module for location tracking.	It lacks real-time application examples and a comprehensive exploration of safety measures. It strongly emphasizes the necessity for proactive self-defense and advocates for a transformative approach to women's security.
Achmad Mustofa Luthfi, Nyoman Karna, Ratna Mayasari	Google Maps API Implementation On IOT Platform For Tracking an Object Using GPS.	The project harmonized NodeMCU with the Neo-6m GPS Module and DHT-11 temperature sensor while also exploring different IoT platforms.	It highlighted the intermediary role of IoT platforms and their significance in facilitating connections between devices. It also suggested the promising potential for expanding IoT functionality, opening up opportunities for further advancements in the field.

# Literature Review

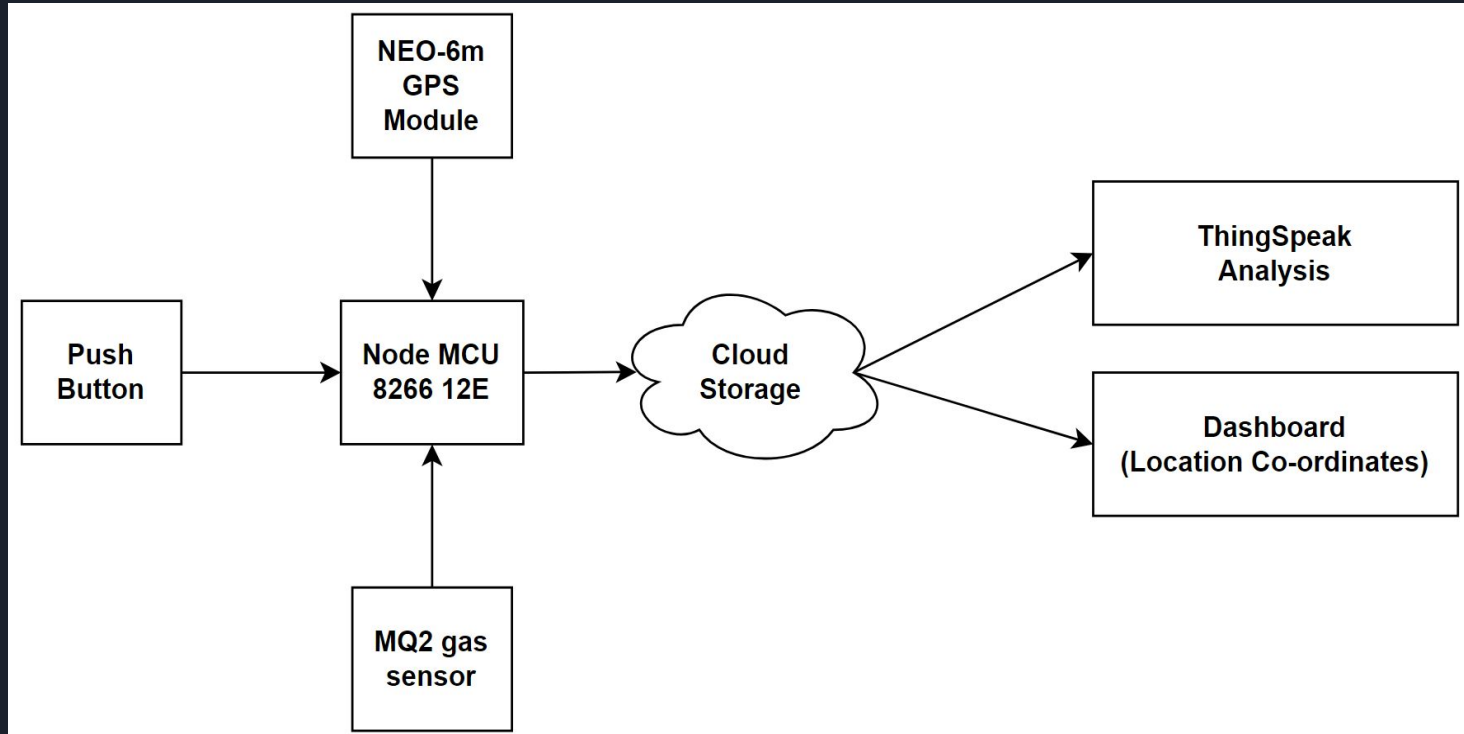
Shaik Mazhar Hussain, Shaikh Azeemuddin Nizamuddin, Rolito Asuncion, Chandrashekar Ramaiah, Ajay Vikram Singh	Prototype of an Intelligent System based on RFID and GPS Technologies for Women Safety.	The project showcased a comprehensive system that incorporated RFID, GPS, AT89C52 microcontroller, and GSM modules, and conducted an extensive literature review focusing on these technologies.	It encompasses cost constraints and signal interferences, which can impede the effectiveness of the system. Moreover, there is a concern about potential access by invalid and unauthenticated users, raising security issues. Furthermore, the state of database security is currently inadequate, adding to the overall vulnerabilities that need to be addressed.
I Kadek Nuary Trisnawan, Agung Nugroho Jati, Novera Istiqomah, Isro Wasisto	Detection of Gas Leaks Using The MQ-2 Gas Sensor on the Autonomous Mobile Sensor.	The project utilized LiDAR and MQ-2 gas sensors for gas leak detection, implemented SLAM navigation and calibration techniques, and assessed the accuracy of the detection system.	It has accuracy issues. Since it uses SLAM methodology, other methods of navigation and detection could provide different and inaccurate results.



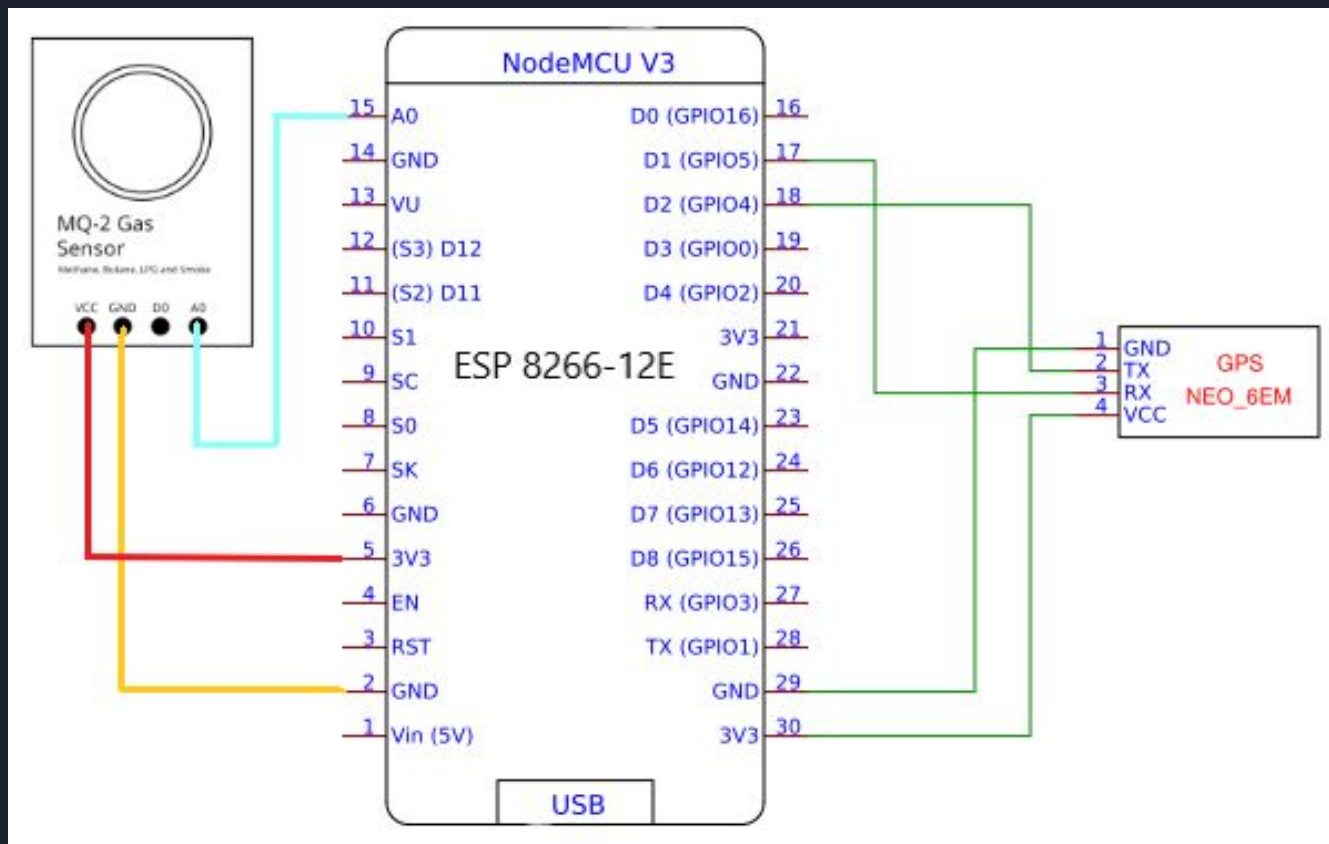
# Problem Statement

- To develop a geotag-enabled safety device with emergency alarm and messaging features to enhance personal safety, empower individuals in distress, and alert others to potential threats using Node MCU-ESP 8266, Neo-6M GPS and MQ-2 Gas Sensor.

# System Design

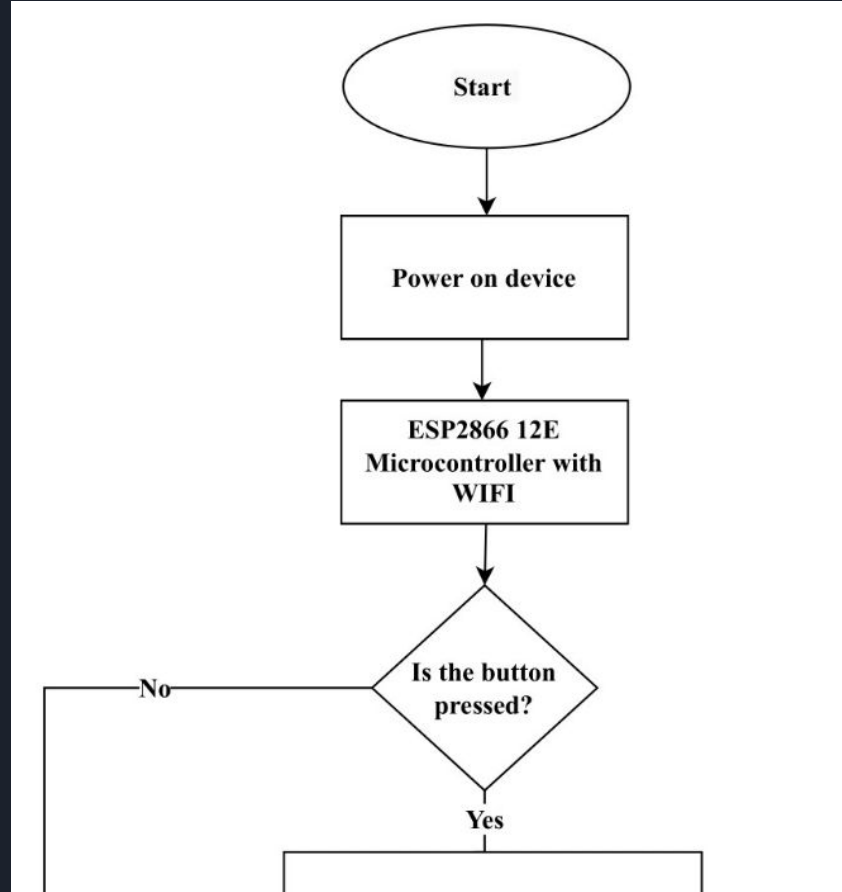


# Circuit Diagram

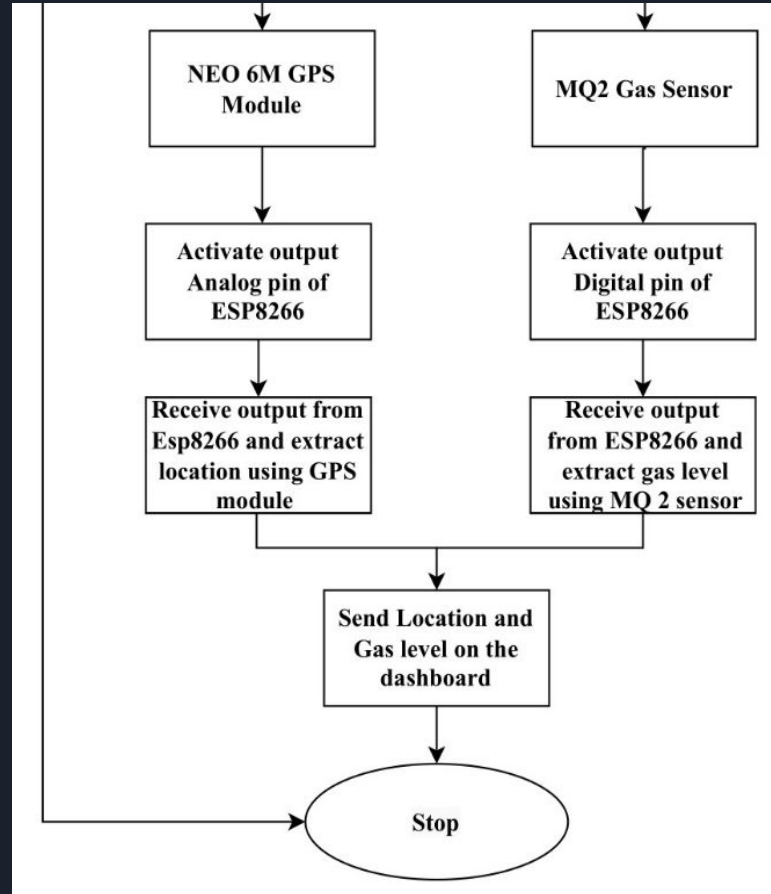




# System Flow



# System Flow





# Hardware/Software Requirements

## Hardware

- NodeMCU ESP8266 Breakout Board
- Adafruit Ultimate GPS Breakout
- Pushbutton Switch, Momentary
- Smoke sensor
- Diode board
- Buzzer
- Cables

## Software

- Arduino IDE
- Google Maps
- ThingSpeak



# Conclusion

This project, centered on a sophisticated safety device equipped with precision GPS tracking and a gas sensor, aims to provide practical solutions for critical situations. It has the potential to empower parents to track their children, enhance women's safety, and protect people of all ages from various dangers, including smoke exposure. In summary, the IoE project embodies the promise of technology to improve safety standards and offers a proactive approach to security. It signifies the evolution of safety solutions in an interconnected world, bringing us closer to a safer and more empowered future.



# References

- [1] S. Khanam and T. Shah, "Self Defence Device with GSM alert and GPS tracking with fingerprint verification for women safety," 2019 3rd International conference on Electronics, Communication and Aerospace Technology (ICECA), Coimbatore, India, 2019, pp. 804-808, doi: 10.1109/ICECA.2019.8822114.
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- [3] S. M. Hussain, S. A. Nizamuddin, R. Asuncion, C. Ramaiah and A. V. Singh, "Prototype of an intelligent system based on RFID and GPS technologies for women safety," 2016 5th International Conference on Reliability, Infocom Technologies and Optimization (Trends and Future Directions) (ICRITO), Noida, India, 2016, pp. 387-390, doi: 10.1109/ICRITO.2016.7784986.
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