GAS LEAKAGE

DETECTION FOR

HEALTHCARE

Advanced Gas Pipeline Leakage Detection for Healthcare Facilities

WOKWI | THINKSPEAK | ANDROID

INTRODUCTION

Gas pipeline leakage detection system for hospitals, employing a combination of IoT technologies and sensor equipment for real time gas levels monitoring. An Android app enhances user interaction by delivering instant alerts and allowing for on-the-go monitoring and response to detected leaks.

FLOW

WOKWI

WOKWI

Online microcontroller simulator to develop and test the ESP32-based gas leakage detection system

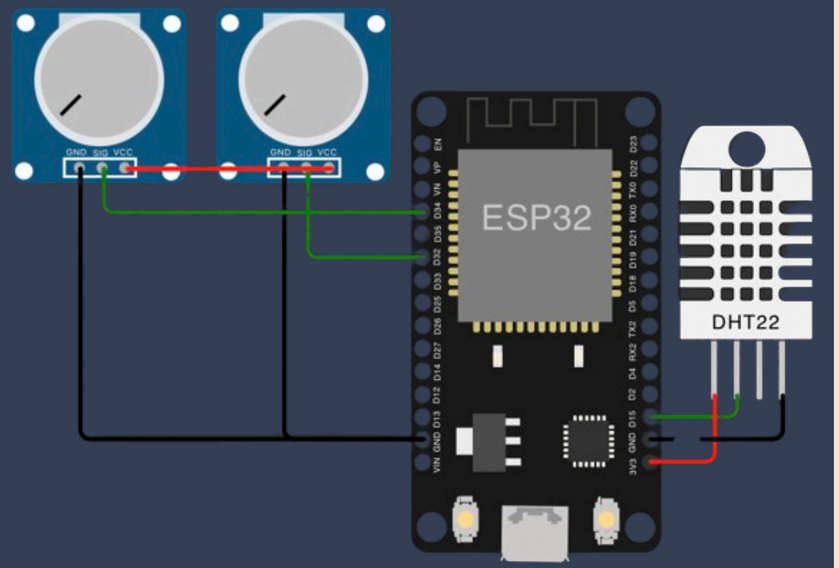
THINKSPEAK

Collecting and storing sensor data online, allowing realtime visualization and analysis

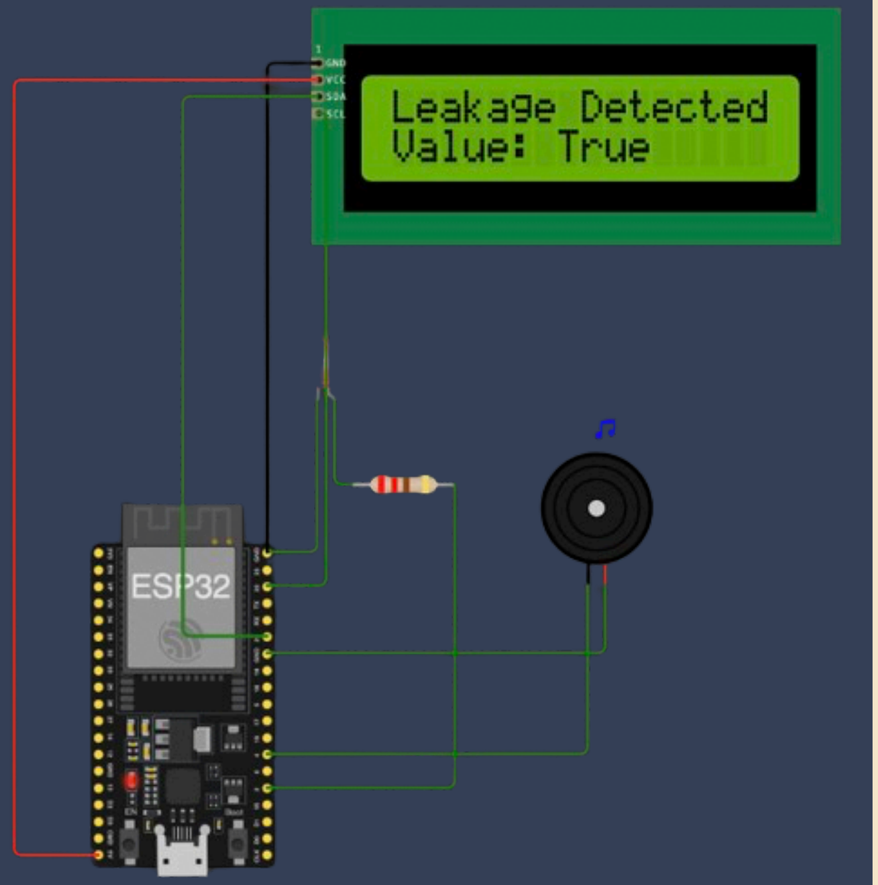
APPLICATION

Provide users with real-time updates allowing realtime gas leak alerts, monitoring, and responsive action.

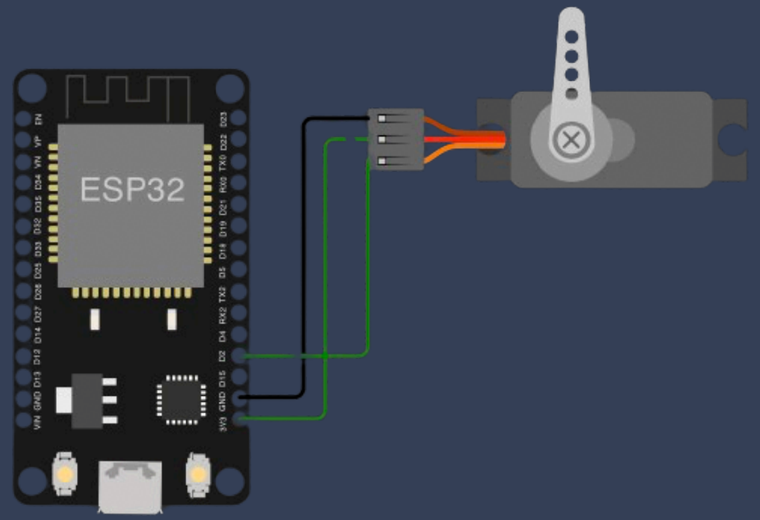
WOKWI CONNECTIONS



Using DHT22 sensor and potentiometer to measure surrounding conditions



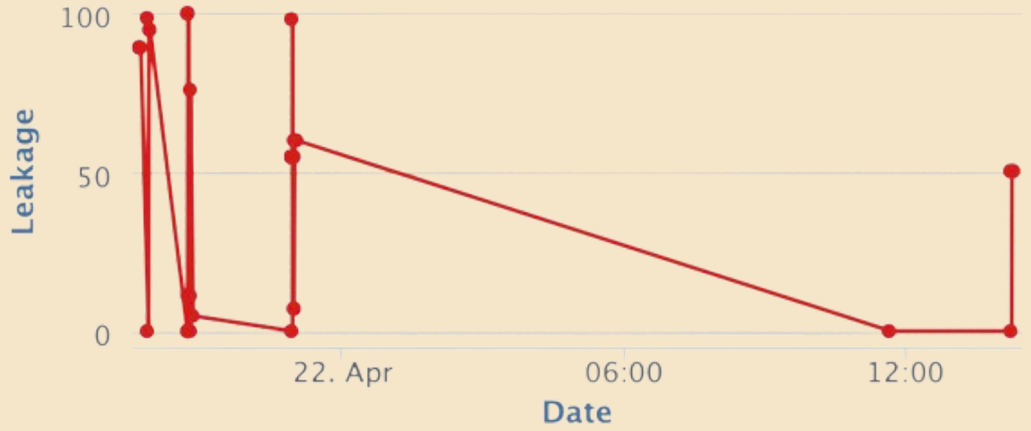
ESP32 with LCD and a buzzer for detecting and alerting leakages

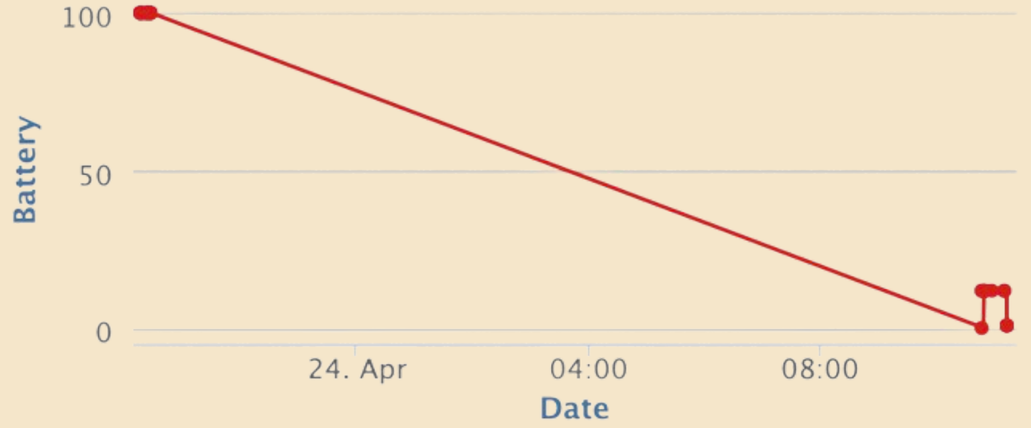


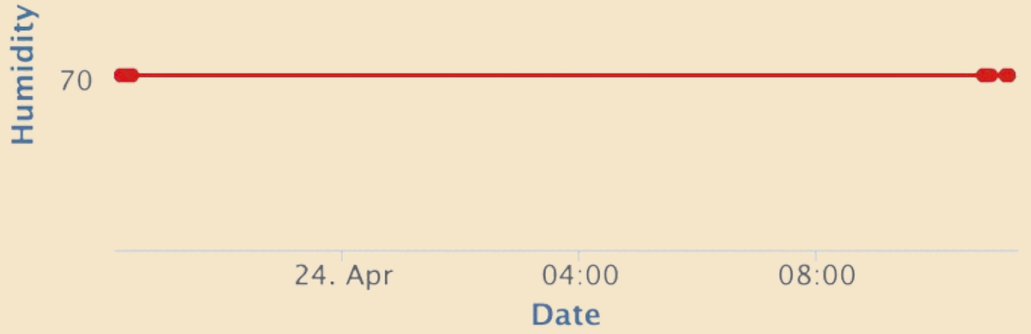
Using servo motor to open vents during leakages

THINKSPEAK

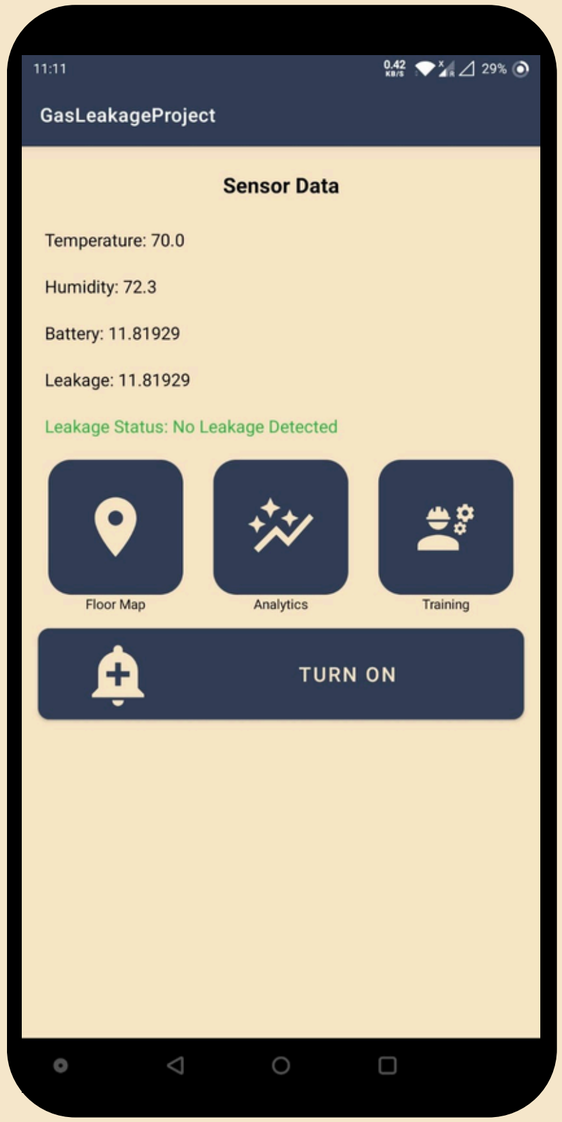
Used ThingSpeak for collecting, analyzing, and visualizing real time sensor data related to gas concentrations. This cloud-based platform enables the aggregation of data from various sensors spread across hospital premises, providing a centralized approach to monitor environmental conditions and detect gas leak anomalies.







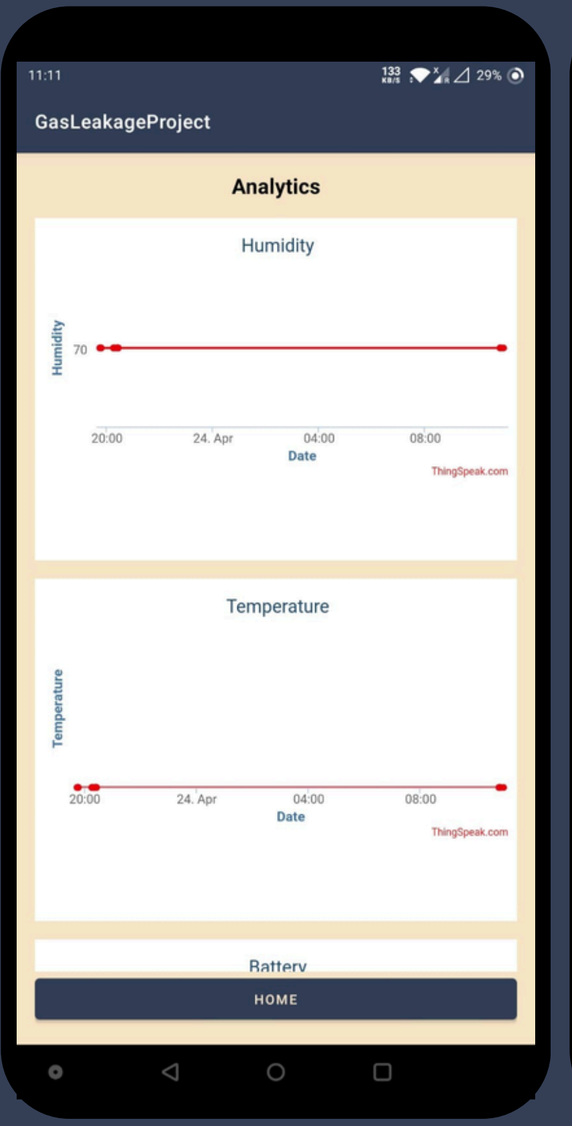
APPLICATION



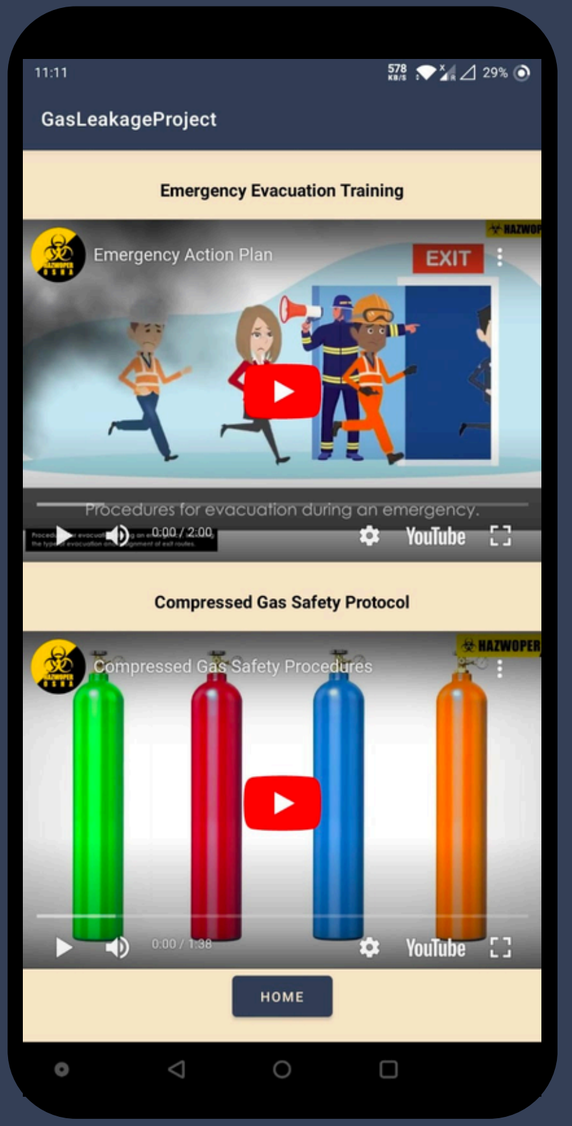
Android application providing real-time alerts and monitoring capabilities to staff

Floor Map

Analytics



Training



WRAP-UP

CONCLUSION

Gas leakage detection is critical for ensuring the safety and well-being of patients, staff, and visitors. The timely identification plays a pivotal role in preventing fires, explosions, and health hazards. Integrating sensor technologies with IoT systems, equips hospitals with continuous real time gas pipelines monitoring. This approach not only facilitates the immediate detection of potential leaks but also enables rapid alert issuance and decisive action to effectively mitigate risks. This system significantly bolster hospital security, dramatically reducing the likelihood of incidents and maintaining a secure environment for everyone.

FUTURE WORK

Future enhancements include the development of more sensitive and accurate sensors, reducing false alarms and improving reliability. Wireless sensor networks will support real-time data transmission and centralized monitoring, facilitating faster responses. Integration of predictive maintenance techniques will enable proactive monitoring and maintenance of gas pipelines, minimizing downtime and preventing incidents. Additionally, advanced data analytics and visualization tools will provide hospitals with actionable insights, aiding in resource optimization and informed decision-making.

BIBLIOGRAPHY

- "INTELLIGENT GAS LEAK DETECTION SYSTEM WITH ESP32" - ROBOTIQUE TECH
- "SENSOR TECHNOLOGIES FOR GAS LEAK DETECTION" - MDPI SENSORS JOURNAL
- "PREVENTIVE LEAK DETECTION FOR HIGH-PRESSURE GAS TRANSMISSION NETWORKS" - IBM RESEARCH
- "WIRELESS GAS LEAKAGE DETECTION SYSTEMS" - UPIKPTSS JOURNAL OF RESEARCH IN INNOVATION AND MANAGEMENT
- "ENHANCED TECHNIQUES FOR GAS LEAK DETECTION" - INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH IN ENGINEERING & MULTIDISCIPLINARY PHYSICAL SCIENCES

THANK YOU