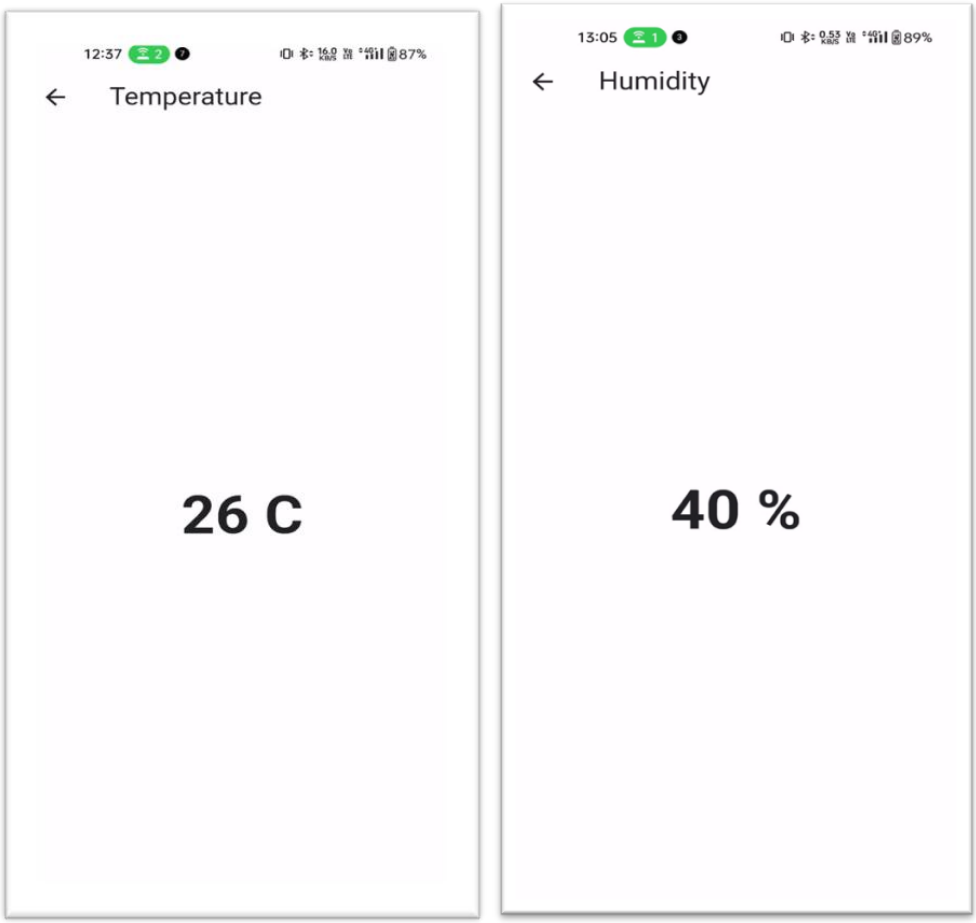
CODE OUTPUT

KRUTI SHAH 60004210122

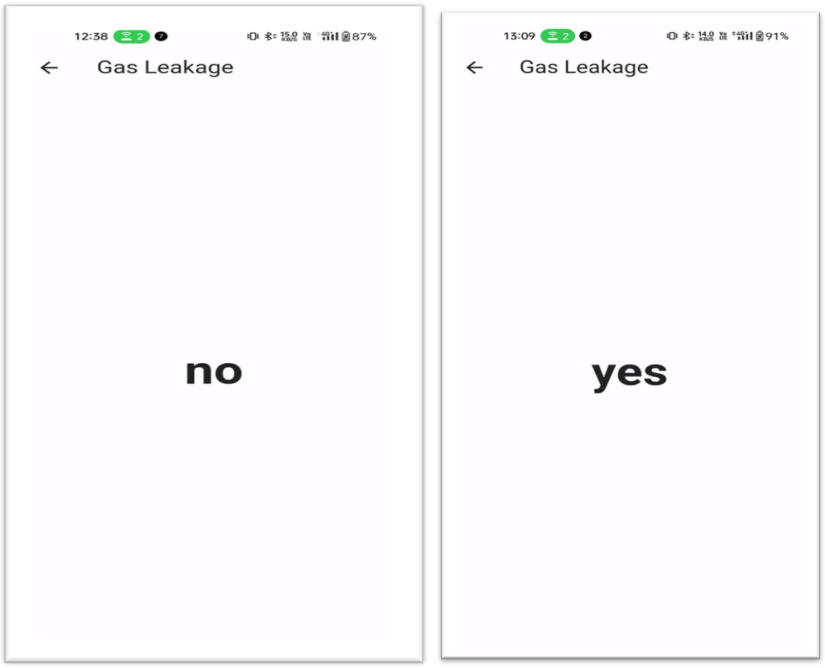
SHASHWAT SHAH 60004220126

KHSUHI SHAH 60004210147

MANASVI GUPTA 60004210235



Depicting temperature and humidity results obtained.



Depicting whether gas leakage has been detected.

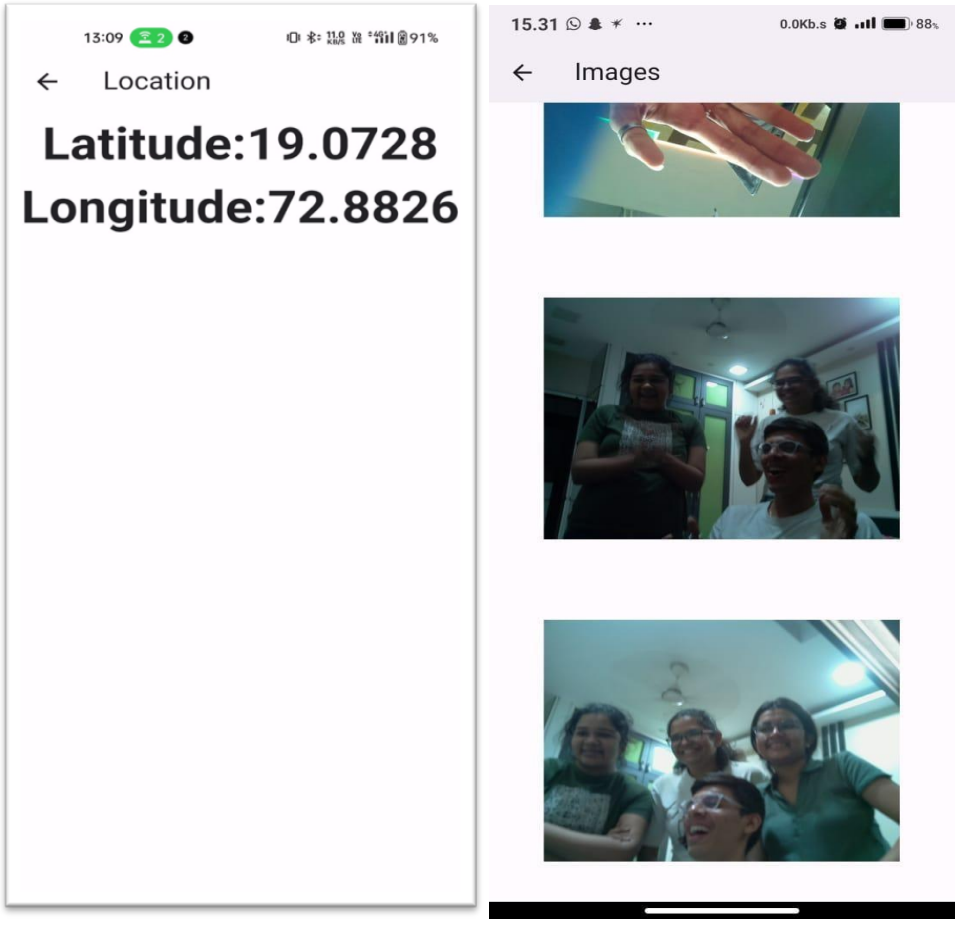
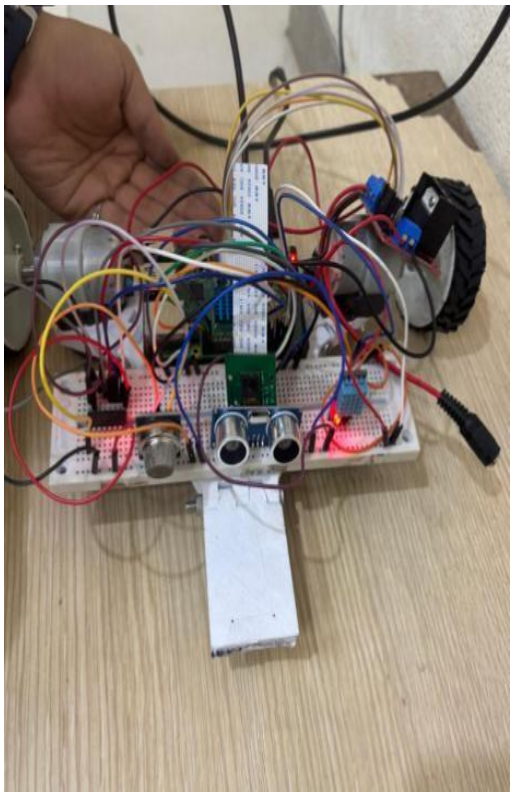


Fig 8. Location and images captured displayed.

The HazardScout system provides real-time environmental monitoring and emergency response capabilities through an IoT-enabled robot. Key outputs include:

- Gas Leakage Detection: Detects the presence of flammable gases using the MQ5 sensor and triggers alerts when concentrations exceed safe thresholds.
- Temperature & Humidity Monitoring: Continuously logs ambient conditions via the DHT11 sensor to identify unusual patterns linked to potential leaks or unsafe environments.
- Obstacle Detection: The ultrasonic sensor measures distance and halts the robot to avoid collisions, ensuring safe navigation along pipelines.
- Visual Inspection: High-resolution images are captured using the PiCamera and uploaded to Firebase Storage. These are accessible remotely for inspection and documentation.
- Cloud Integration: All sensor data and visual feeds are updated to Firestore, allowing live monitoring through a user-friendly dashboard.
- Emergency Alerts: When gas leakage is detected, the system automatically sends SMS notifications using Twilio to alert stakeholders instantly.
- Location Tracking: The robot updates its GPS location periodically using the

geocoder library, allowing operators to track movement and pinpoint leak locations.

- Remote Control & Autonomy: Users can remotely control the robot's movement and functions, or allow it to operate autonomously based on sensor input.

This integrated output enables safe, efficient, and intelligent inspection of industrial pipelines, reducing the need for manual labor and enabling early intervention in hazardous scenarios.