

ENVIROTRACK SHIELD

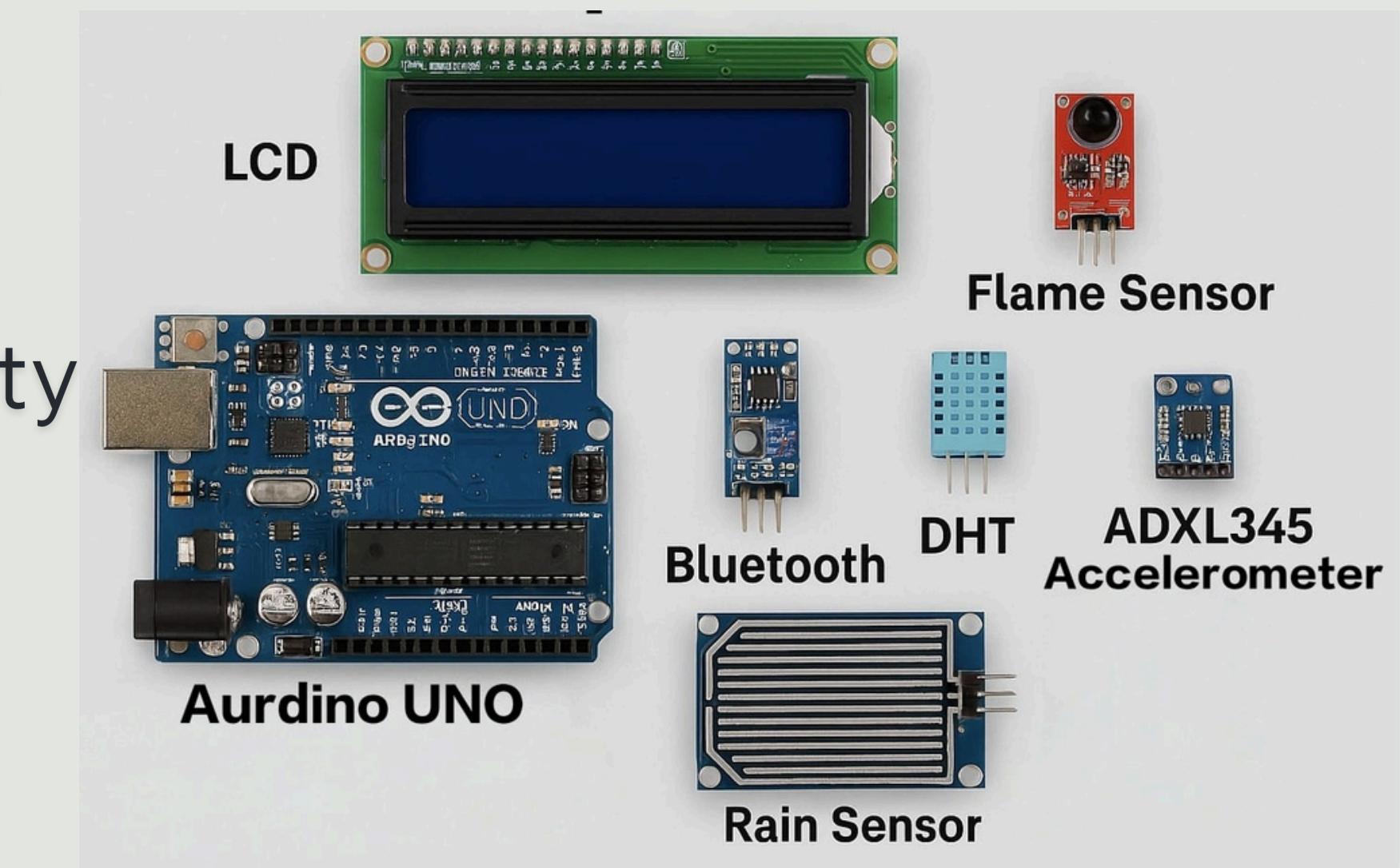
CSE 323-Internet of Things
Project

INTRODUCTION

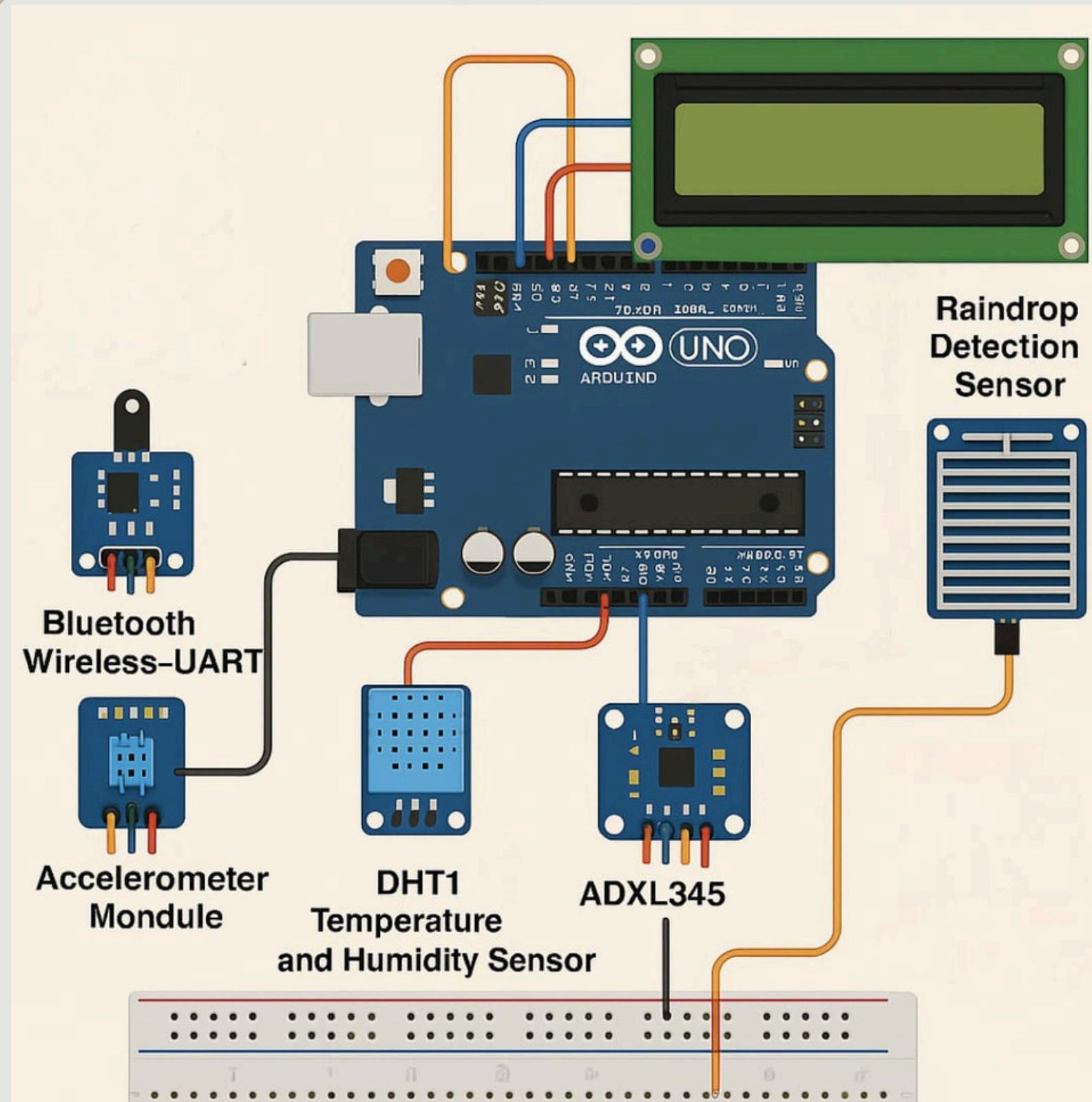
- EnviroTrack Shield is an IoT-based smart safety device developed using Arduino UNO.
- It monitors environmental conditions and human activity in real-time.
- Main features:
 - ~Fall detection with Bluetooth message alert
 - ~Step count & speed estimation
 - ~Weather monitoring (temperature, humidity, rain)
 - ~Data display on LCD screen

COMPONENTS USED

- Arduino UNO
- ADXL345 Accelerometer
- HC-05 Bluetooth Wireless UART
- Raindrop Detection Sensor
- DHT11 Temperature And Humidity Sensor Module
- LCD Display
- Breadboard and Jumper Wires



BLOCK DIAGRAM



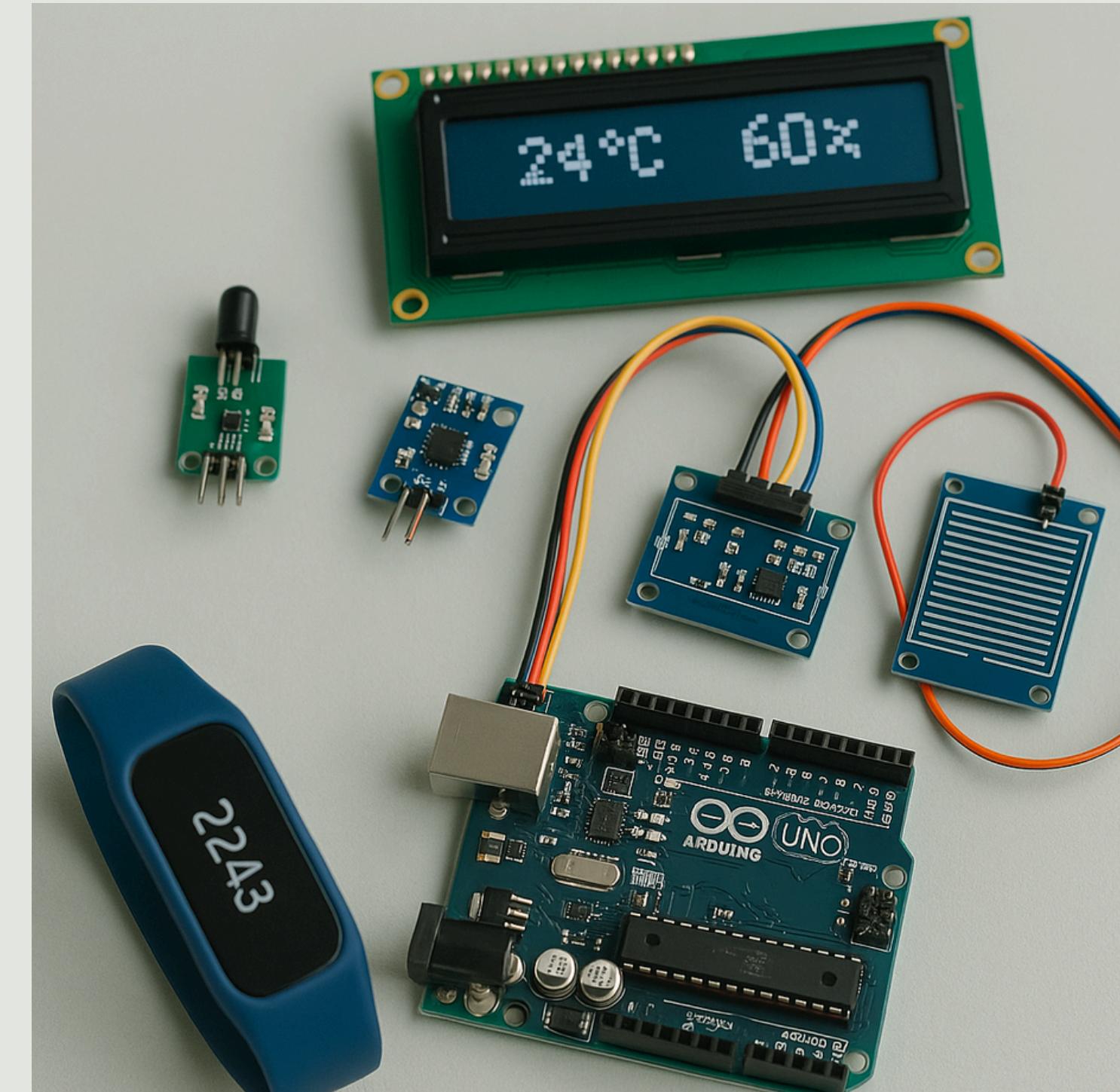
- Sensors send data to Arduino UNO.
- Arduino processes and takes action.
- Bluetooth for mobile connectivity.
- LCD for display of the output.

WORKING FLOW

- Sensors collect real-time data.
- Arduino processes sensor values.
- Fall Detection Algorithm: Monitor sudden changes in X, Y, Z axes.
Compare with threshold values. If fall detected → Send SMS Alert.
- Step Counting Logic: Count steps based on acceleration patterns.
Calculate speed from step count & time.
- Display Output on LCD.
- Rain Detection triggers alert.

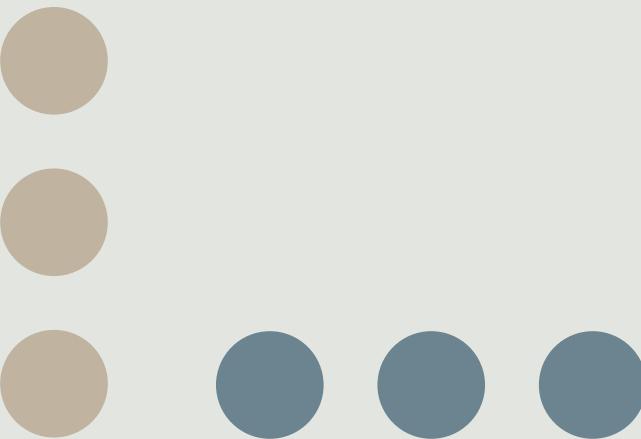
ADVANTAGES

- Low-cost Implementation.
- Real-time Monitoring.
- Easy to use & Portable.
- Multi-featured device.



LIMITATIONS

- Limited range for Bluetooth Communication.
- Accuracy depends on sensor quality.
- SMS requires network availability.
- Battery backup required for portability.



RESULTS

These are the some results obtained:

```
Terminal
14:08:43.700 Temp: 36.3 C, Humidity: 63.0%, Steps: 9, Speed: 0.
14 m/s, Fall: NO, Rain: NO, Rain(A): 1018
14:08:44.841 Temp: 36.3 C, Humidity: 63.0%, Steps: 9, Speed: 0.
14 m/s, Fall: NO, Rain: NO, Rain(A): 1018
14:08:46.045 Temp: 36.3 C, Humidity: 63.0%, Steps: 9, Speed: 0.
14 m/s, Fall: NO, Rain: NO, Rain(A): 1019
14:08:46.045 Speed: 0.00 m/s
14:08:47.210 Temp: 36.3 C, Humidity: 62.0%, Steps: 9, Speed: 0.
00 m/s, Fall: NO, Rain: NO, Rain(A): 1019
14:08:48.378 Temp: 36.3 C, Humidity: 62.0%, Steps: 9, Speed: 0.
00 m/s, Fall: NO, Rain: NO, Rain(A): 1019
14:08:49.588 Temp: 36.3 C, Humidity: 62.0%, Steps: 9, Speed: 0.
00 m/s, Fall: NO, Rain: NO, Rain(A): 1018
14:08:50.750 Temp: 36.3 C, Humidity: 62.0%, Steps: 9, Speed: 0.
00 m/s, Fall: NO, Rain: NO, Rain(A): 1019
14:08:51.950 Temp: 36.3 C, Humidity: 62.0%, Steps: 9, Speed: 0.
00 m/s, Fall: NO, Rain: NO, Rain(A): 1018
14:08:51.950 Speed: 0.00 m/s
14:08:53.121 Temp: 36.3 C, Humidity: 62.0%, Steps: 9, Speed: 0.
00 m/s, Fall: NO, Rain: NO, Rain(A): 1019
```



FUTURE ENHANCEMENTS

- Integration with cloud services for data storage.
- Mobile App with real-time monitoring dashboard.
- GPS module addition for location tracking during fall alerts.
- Machine Learning for advanced fall detection accuracy.

CONCLUSION

- The fall detection system, along with real-time SMS alert functionality, has proven to be both responsive and reliable during testing.
- Environmental monitoring features—including temperature, humidity, and rain detection—are functioning accurately, providing live updates.
- We also tested and validated the step counting and speed estimation module, which works efficiently for tracking movement and physical activity.

Thank You

Done By

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