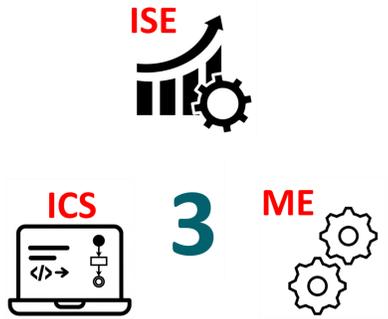# TEAM 46

Wearable Biometric Device for Health Monitoring and Emergency Alerts

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Coach: Abdullah Alsharafi

ISE

ICS 3 ME

Objective of the Project

• The project aims to create a wearable biometric device for real-time health monitoring and emergency alerts in high-risk environments. It will track vital signs such as heart rate, oxygen levels, and body temperature to detect health issues early and notify medical personnel. Targeted settings include mass gatherings, industrial areas, healthcare facilities, and transportation hubs, focusing on safety and emergency response in these spaces.
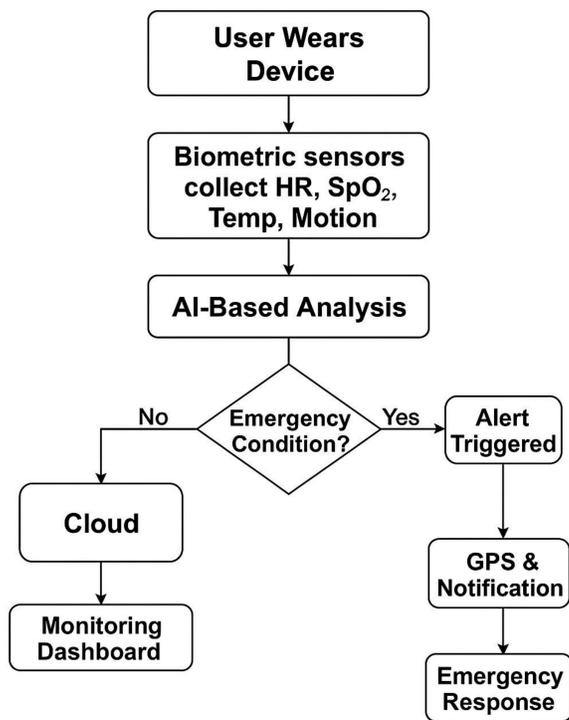
Constraints and Specs

Constraints and Specifications	Off-the-Shelf	Project Specific (Not Off-the-Shelf)	Responsible Department		
			ME	ISE	CS
Sensor Calibration	✓		✓		
Reusable Materials		✓	✓		
Cost Limitation		✓		✓	
Real-Time Processing		✓			✓
Machine learning model accuracy: ≥ 80% for fatigue detection.		✓			✓
Alert accuracy ≥ 80		✓		✓	
Total Volume ≤ 50 cm3 To Ensure Portability		✓	✓		
Lightweight Design < 250g		✓	✓		
99 % Uptime		✓			✓
Real-Time Alerts within 10 seconds		✓	✓	✓	✓
Response Time ≤ 30 Seconds		✓	✓	✓	✓
Low-Cost Production < $25		✓	✓	✓	✓

Prototype Development
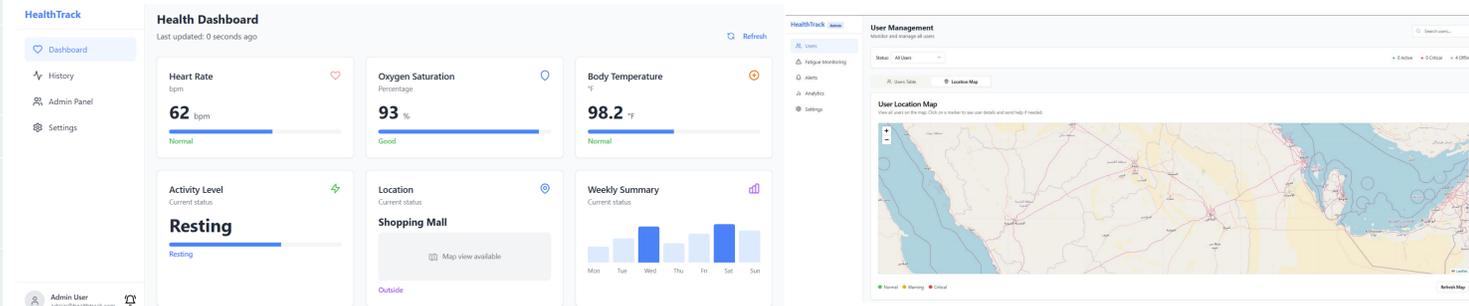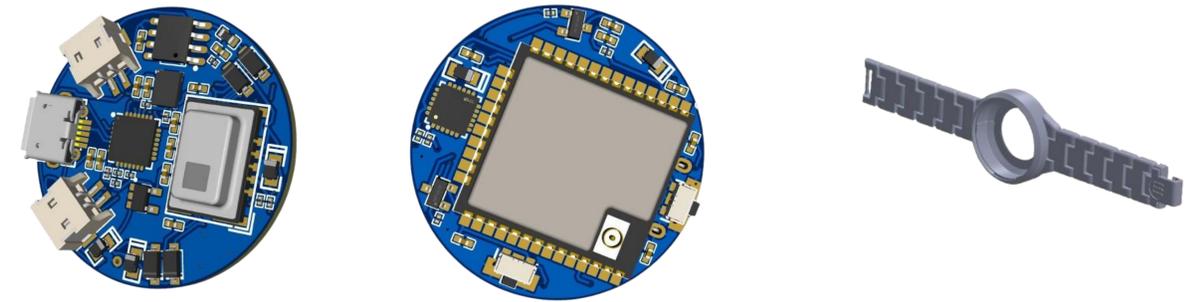
Testing and Validation

We validated our wearable device for Expo 2030 Riyadh using a MILP model in Python and spatial analysis. We simulated 150 demand points and selected 5 healthcare centers, achieving 100% coverage. This demonstrates potential for scalable emergency response in urban events.