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(57) Abstract :
The invention discloses an intelligent healthcare system for elderly fall prediction, detection, and emergency response. It integrates wearable IoT sensors, edge-based artificial intelligence (Edge-AI), and cloud analytics to monitor physiological and motion data in real time. The Edge-AI module predicts imminent fall risks based on movement patterns and triggers preventive alerts, while the cloud platform analyzes long-term health trends to provide predictive insights to caregivers. The system features adaptive multi-sensor fusion algorithms that adjust sensitivity dynamically based on posture and environmental context, improving detection accuracy and minimizing false positives. A built-in offline-capable emergency alert mechanism ensures timely notifications even in low-connectivity environments. The invention enhances proactive elderly care, enables early medical intervention, and ensures continuous monitoring regardless of network availability.

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