



# Patient Motion Monitoring System

- A patient-activated IoT home rehabilitation monitoring system that safely tracks recovery without intrusive surveillance, using a **leg-worn IMU** and **room radar** to measure activity and detect safety risks.
- **Patient** : the system operates on patient-activated sessions to measure steps, stair climbing, and basic movement states
- **Caregiver** : Simultaneously monitoring for falls and prolonged immobility, when a risk is detected it alerts a caregiver, and the patient can confirm they are okay to cancel the alert.
- **Doctor** : uniquely providing doctors with both a real-time view of the current session and detailed historical summaries that translate raw sensor data into actionable clinical metrics.

Wiring diagram

The wiring diagram illustrates the hardware setup. An ESP32 development board is connected to an MPU9250 IMU module and an RD-03D RADAR module. The IMU is connected via I2C, and the RADAR is connected via a serial port. Both modules are powered by the ESP32.

Flutter app

**Session Details:**

- Time: 21:41 - 21:46 Duration: ~4 min
- Steps/min: 5.0
- Stairs/min: 4.3
- Total Steps: 20
- Total Stairs: 17
- Falls: 1 events
- All Alerts: 1

**Caregiver Alerts (p1):**

- FALL ALERT 21:41 (29/1) MARK AS HANDLED
- FALL ALERT 21:25 (29/1) HANDLED BY CAREGIVER

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A Project in Internet of Things (IoT)