Gesundheitswächter

Wearable Real-Time System for Infectious Disease Detection in Rwanda

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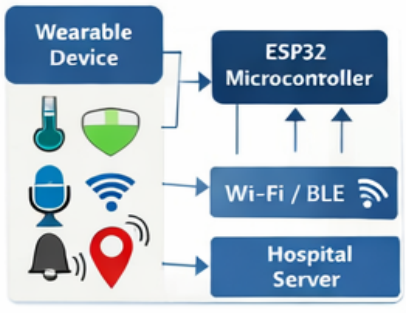
System Architecture Overview



How It Works

Benefits for Rwanda

- Early Detection of Infections
- Rapid Medical Response
- Reduced Disease Spread
- Enhanced Public Health

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1. Introduction
The Gesundheitswächter project aims to create a wearable device that detects contagious diseases in re

2. Project Goal
To develop a wearable device that automatically detects risk from nearby individuals with contagious dise

3. System Architecture
- Wearable Device (wristband/body device)
- Sensors: temperature, pulse, respiration, humidity, microphone, BLE/UWB proximity, GPS
- Microcontroller: ESP32 or similar
- Communication: BLE, Wi-Fi, GSM (for data transmission)
- Server / Hospital System: threshold detection, decision logic, logging, notifications
- Alert Mechanism: vibration, LED, buzzer

4. Sensors and Components
- Temperature Sensor (DS18B20 / MLX90614)
- Pulse Sensor (MAX30100 / MAX30102)
- Respiration / Humidity Sensor (DHT22 / MQ sensors)
- Microphone (Electret / MEMS)
- Proximity Module (BLE / UWB)
- GPS Module (u-blox / NEO-6M)
- Vibration Motor / Buzzer
- LED Indicators
- Battery: 3.7V Li-ion with charging module (TP4056)
- ESP32 Microcontroller

5. Workflow & Logic
- Scan proximity for nearby individuals
- Capture vital signs and microphone input
- Check thresholds: distance <1m, temperature >38°C, abnormal pulse/respiration, cough frequency
- Trigger alerts if thresholds are exceeded
- Send data to server for hospital integration

6. GPS Integration
- Capture real-time location
- Provide hospital systems with exact location for emergency response
- Enable hotspot mapping and contact tracing