**Background**

Traditional methods for monitoring the health of residents in group care facilities are often invasive, labor-intensive, and prone to inaccuracies, leading to delays in identifying and addressing health issues. In response, we designed a wearable that provides continuous, real-time health and environmental data to enhance resident monitoring and enable immediate medical intervention when necessary.

**Overview**

Our smartwatch is equipped with sensors to track critical health metrics, including heart rate, blood oxygen levels, body temperature, movement, and noise exposure. It also monitors environmental factors that can impact health, such as temperature, humidity, pressure, and air quality. The watch connects to a user’s smartphone via Bluetooth, allowing both the user and healthcare providers to access and monitor these data through a dedicated application.

**Block Diagram**

- 7.4V Li-Po Battery
- 10mm Rotary Encoder
- Coin Vibration Motor
- LCD Display Controller
- Microcontroller
- Noise Sensor
- Pulse Oximeter & Heart Rate Sensor
- Biometric Sensor Hub
- I2C
- ADC
- Digital Contact Thermometer
- Accelerometer, Gyroscope, & Magnetometer
- Temperature, Pressure, Humidity, & Air Quality Sensor
- Symbols
- Sensor
- UI Output
- Microcontroller
- Input

**Software Flow**

- **Wearable Device**
  - **Start**
  - **Power On**
  - **Bluetooth & Peripheral**
  - **Begin Threaded Operation**
  - **Scan for Bluetooth Devices**
  - **Trigger Sensor Readings**
  - **Display Start-Up Information**
  - **Check for User Input**
  - **Transmit Data Over Bluetooth**
  - **Refresh Display with Current Data**
  - **Unusable Stop Clock & Low Indicator**

- **Android Application**
  - Provides intuitive displays for health and weather data.
  - Alerts users when medical emergencies are detected.
  - Logs data for further analysis and review by medical staff.

**6-Layer PCB**

- 50 mm
- 35 mm

**Final Product**

- **Android Application:**
  - Provides intuitive displays for health and weather data.
  - Alerts users when medical emergencies are detected.
  - Logs data for further analysis and review by medical staff.

**User Interface**

- **Body Temp:** 98.6°F
- **Total Steps:** 8072
- **Heart Rate (BPM):** 65
- **Blood Pressure:** 97
- **Alert:** 10,000 Steps

**Acknowledgements:**

Faculty Advisor - Dr. Yogananda Isukapalli | Teaching Assistant - Brian Li | Sponsor - IFT