



ROHINI COLLEGE OF ENGINEERING AND TECHNOLOGY

AUTONOMOUS INSTITUTION

Approved by AICTE & Affiliated to Anna University
NBA Accredited for BE (ECE, EEE, MECH) | Accredited by NAAC with A+ Grade

Anjugramam - Kanyakumari Main Road, Palkulam, Variyoor P.O. - 629 401, Kanyakumari District.

Department of Biomedical Engineering

VI Semester

CBM 370 - Wearable Devices

Unit- 5 APPLICATIONS OF WEARABLE SYSTEMS

5.4 Elderly patients

- ❖ As wearable technology continues to evolve, the future holds exciting possibilities for enhancing the lives of seniors even further.
- ❖ The integration of artificial intelligence (AI) with wearable technology will allow AI algorithms to analyze vast amounts of health data collected by wearables, providing predictive insights and personalized recommendations.
- ❖ For example, AI could predict potential health issues before they become serious, allowing for preventive measures to be taken. This could lead to more proactive and tailored healthcare for seniors, improving outcomes and quality of life.
- ❖ Wearable devices are increasingly used to enhance healthcare for elderly patients, providing continuous monitoring, early detection of health issues, and promoting independence.

Some of the applications personalized for the elderly population are,

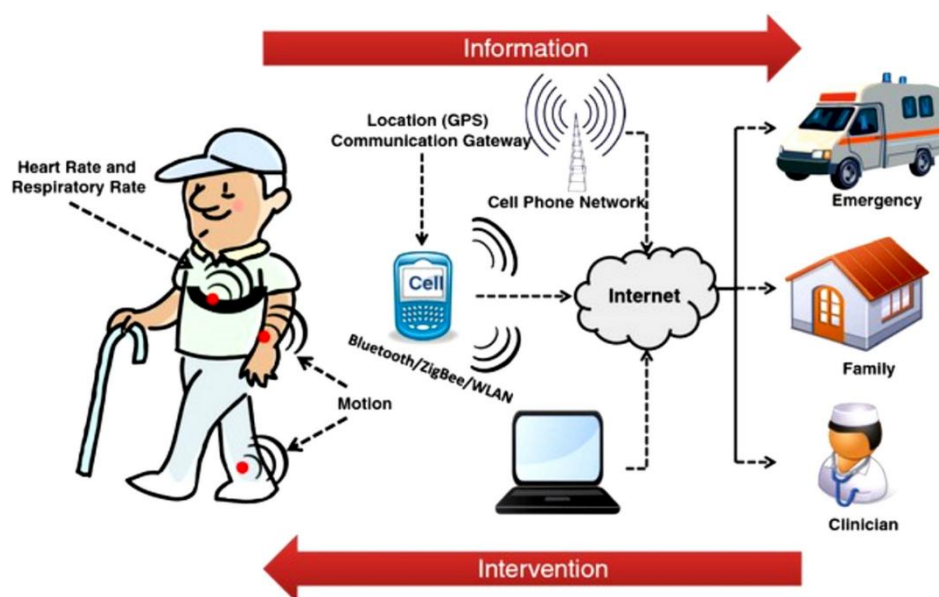
1. Health Monitoring
2. Mobility, Fall detection and Emergency alerts
3. Chronic Disease Management
4. Safety and Location Tracking
5. Medication Management
6. Remote Patient Monitoring
7. Independence and Quality life
8. Communication and Alerts

1. Heath Monitoring:

- ❖ **Vital Signs Tracking:** Continuous monitoring of heart rate, blood pressure, oxygen saturation, respiratory rate, and body temperature. This helps in early detection of abnormalities and timely intervention.
- ❖ **Sleep Monitoring:** Tracking sleep patterns and quality, which is crucial for overall health in older adults.
- ❖ **Heart Rate Tracking:** Devices monitor heart rate continuously, identifying irregularities like arrhythmias or spikes in heart rate. This is especially beneficial for patients with cardiovascular conditions

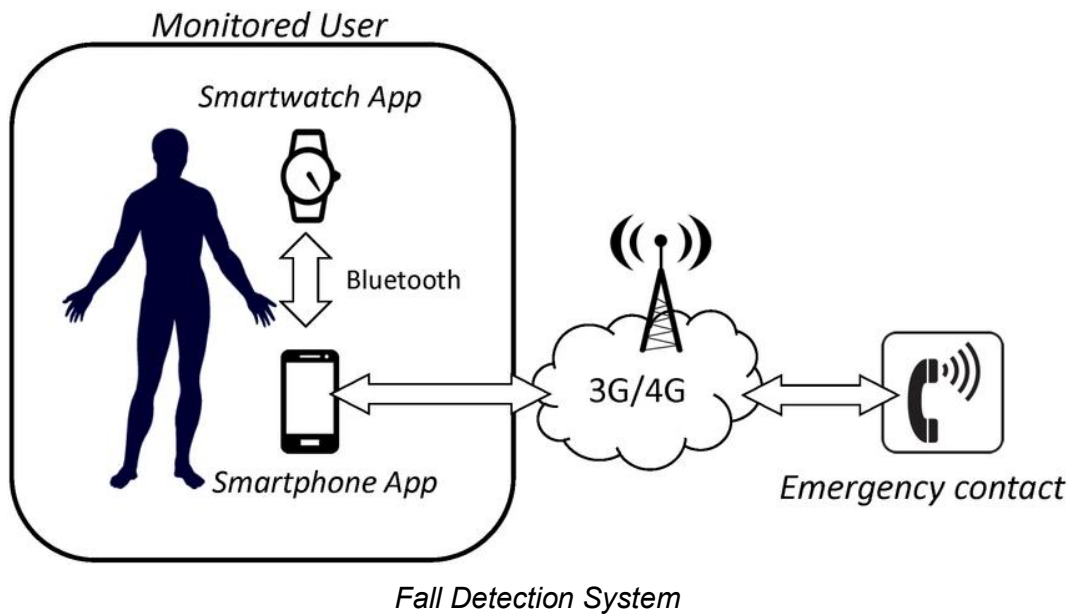
2. Mobility, Fall detection and Emergency alerts:

- ❖ **Fall Detection:** Equipped with accelerometers and gyroscopes, wearable devices such as smartwatches or pendants detect sudden impacts or movements indicative of falls. These devices automatically alert emergency contacts or services, ensuring timely assistance
- ❖ **Gait Analysis:** Analyzes walking patterns to identify fall risk or neurological conditions like Parkinson's disease.
- ❖ **Activity Tracking:** Encourages physical activity by tracking steps, movement, and inactivity, promoting overall fitness.



3. Chronic Disease Management:

- ❖ **Diabetes:** Continuous glucose monitors (CGMs) provide real-time blood sugar readings, enabling better glycemic control and reducing complications.
- ❖ **Respiratory Conditions:** Wearables track oxygen saturation and respiratory rates, aiding in the management of COPD and asthma.



4. Safety and Location Tracking:

- ❖ **GPS Tracking:** Assists in monitoring the location of elderly patients with dementia or Alzheimer's to prevent wandering.
- ❖ **Geo-Fencing:** Geo-fencing is a location-based service that uses GPS, RFID, Wi-Fi, or cellular data to create a virtual geographic boundary, enabling software or devices to trigger a response when a mobile device enters or exits a defined area.

5. Medication Management:

- ❖ **Medication Reminders:** Wearable devices can be programmed to remind seniors to take their medications on time, preventing missed doses or overdoses.

- ❖ **Detection of Medication-Taking Actions:** Some advanced wearable devices are being developed with sensors that can potentially detect the physical act of taking medication through motion or interaction with smart pill dispensers.

6. Remote Patient Monitoring:

- ❖ Wearables transmit health data to caregivers or healthcare providers via telehealth platforms, enabling remote monitoring and timely interventions without frequent hospital visits.
- ❖ Supports management of conditions like diabetes, COPD, or heart failure through constant monitoring and feedback loops.

7. Independence and Quality life:

- ❖ By enabling self-monitoring of health metrics like heart rate, blood pressure, and activity levels, wearable devices empower elderly patients to manage their health independently while providing peace of mind to caregivers.
- ❖ **Increased Motivation for Healthy Living:** Tracking activity levels and progress can motivate seniors to stay active and pursue a healthier lifestyle.
- ❖ **Social Connection:** Some devices facilitate communication with family and caregivers through messaging or video calls, reducing social isolation.

8. Communication and Alerts:

- ❖ **Two-Way Communication:** Devices with built-in speakers/microphones allow direct communication with caregivers or emergency responders.
- ❖ **Voice Assistants:** Integration with voice assistants like Siri, Google Assistant, or Alexa allows for hands-free communication tasks such as sending quick messages, making calls, or checking information.
