



SNS COLLEGE OF TECHNOLOGY

(AN AUTONOMOUS INSTITUTION)

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Department of Biomedical Engineering

Course Name: 19BM0302 & WEARABLE TECHNOLOGIES

Topic : Physical Activity Monitoring
Semester :6

19BM0302/Wearable Technology /Physical Activity Monitoring
Mr.S.Prince Samuel /AP/BME

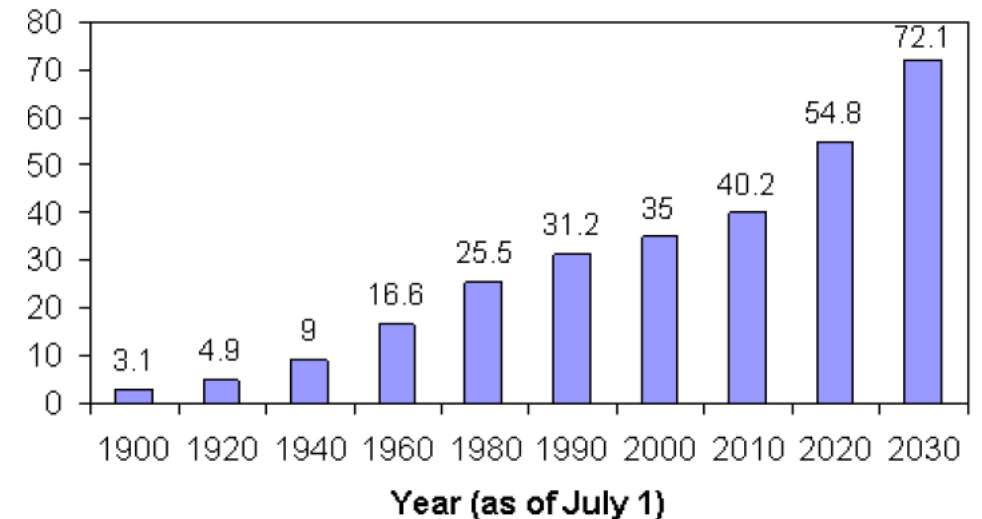


STATISTICS



- The proportion of elderly in the world is demonstrating a remarkable increase every year.
 - By the year 2050, 1 in 5 person in the world will be age 60 or older,
- 1.6 million people in the aging population live in facilities
- Typical residents need assistance with 2 activities of daily living

Figure 1: Number of Persons 65+, 1900 - 2030 (numbers in millions)





RISK FACTORS



- With the increase of elderly people population:
 - Rising Health Care Costs
 - More investment is needed for elderly care
 - Many elderly people choose to stay at home
 - e.g., Due to privacy/dignity issues.
 - A majority of older adults are challenged by chronic and acute illnesses and/or injuries.
 - 80% of older Americans have one or more chronic diseases.
 - The growing insufficiency of traditional family care
 - i.e., decreased care by relatives
 - Decrease in the working population will cause a shortage of skilled caregivers.

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WHAT SERVICES CAN ASSISTED LIVING SYSTEMS OFFER?



- Alarms/notifications and triggers
- Queries
- Reminders
- Detect anomalies and deviations
- Recognize specific behaviors and assist with task completion
- Keep the person active and connected to the social environment

Vision Tit 2

Vision Title 3



OVERVIEW OF SENSOR



- Sensor Networks to Monitor Elderly
 - Activities of Daily Living Monitoring, Tit 2
 - Location Tracking,
 - Medication Intake Monitoring,
 - Medical Status Monitoring,
 - Fall and Movement Detection

Vision Title 3



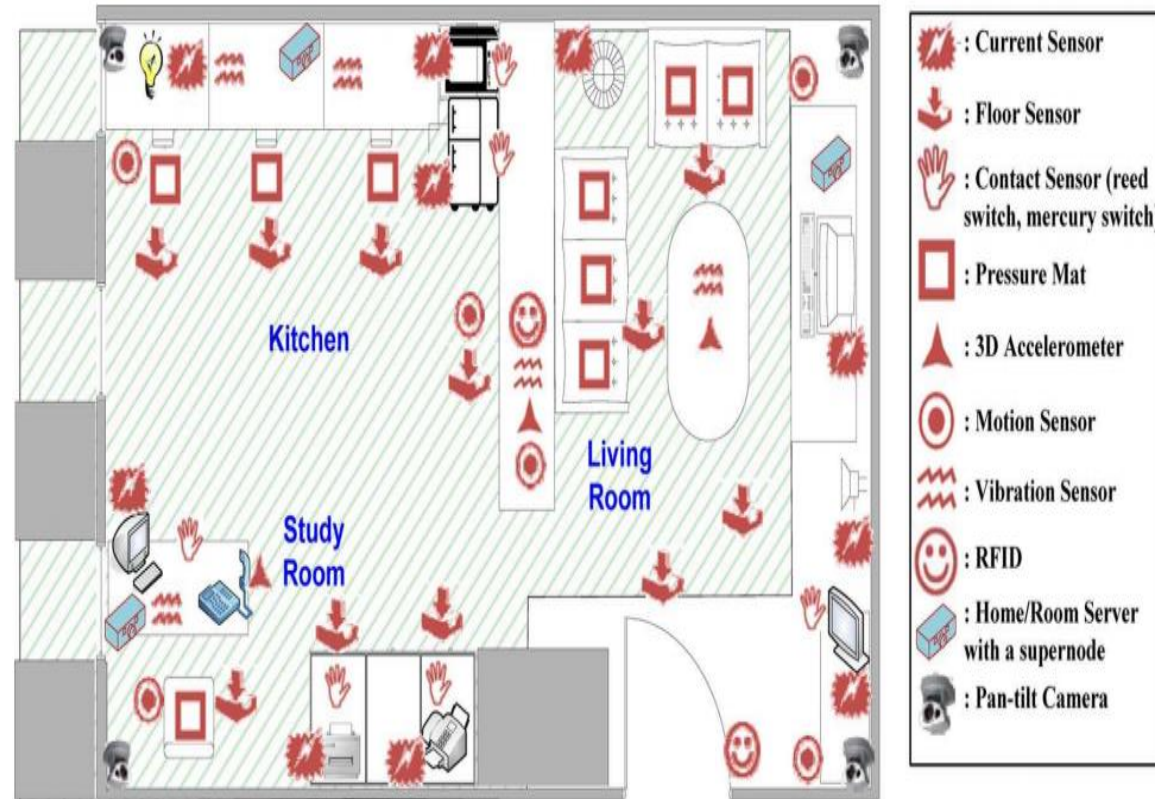
ACTIVITIES OF DAILY LIVING MONITORING

- Monitoring the patient's activities of daily living (ADLs) is essential to
 - Detects anomalies and prompts them,
 - Assist the independent living of older adults
 - The diagnosis of diseases and health problems
- Several projects have investigated the use of pervasive sensors to provide a 'smart' environment for the observation of (ADL)
 - The use of heterogeneous sensors, including
 - Wearable sensors (Body Sensor Network (BSN))
 - Designed to collect biomedical, physiological and activity data
 - Ambient sensors (Ambient Sensor Network (ASN))
 - Designed to collect data around the region where the ADL takes place.



SENSOR MONITORING

- Variety of multi-modal and unobtrusive wireless sensors seamlessly integrated into ambient-intelligence compliant objects (AICOs) to achieve activity recognition



Vision Title 3



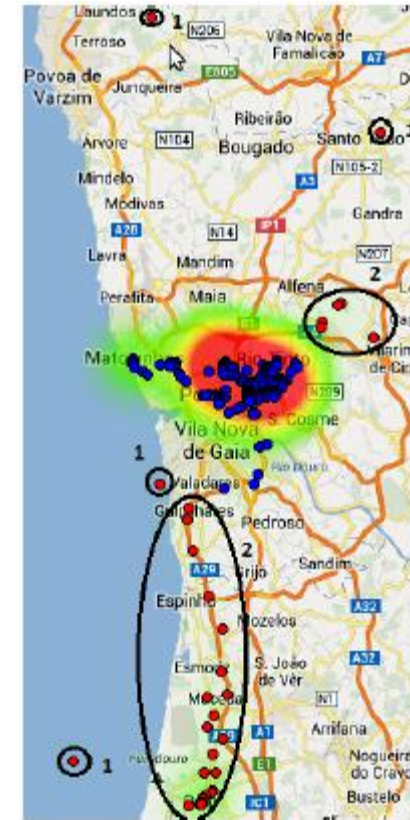
LOCATION TRACKING

- 25% of people over 60+ suffer from Alzheimer's and Dementia
- Seniors with Dementia or Alzheimer's can easily become confused or lost.
- Monitoring location of a person suffering dementia or Alzheimer's can help
 - Detect signs of disorientation or wandering.
 - The health professional to reach a diagnosis of a type of dementia.
- Several methods for location tracking have been proposed:
 - GPSs based outdoor location tracking
 - RFID-based indoor location tracking
 - IR, ultrasound

Vision Title 3



USES OF WEARABLE TECHNOLOGY



(a) Visualization with highlighted warnings



MEDICATION INTAKE MONITORING



- Taking medications is one of the most important activities in an elder's daily life
 - Elders taking on average of about 5.7 prescription medicines and 4 nonprescription drugs each day.
- Medication intake monitoring is essential
 - Medication noncompliance is common in elderly and chronically ill especially when cognitive disabilities are encountered .
- The existing methods/systems often utilize following sensor technologies for medication intake monitoring
 - RFID
 - Computer vision

A top-down photograph of a white card with the words "Thank you" written in purple cursive. The card is placed on a light-colored marble surface. To the left of the card is a bouquet of purple flowers. To the right is a black pen with a white polka-dot grip and a small gift wrapped in white paper with a black dot pattern, tied with red and white striped twine. A spool of the same twine is in the top right corner.

Thank
you