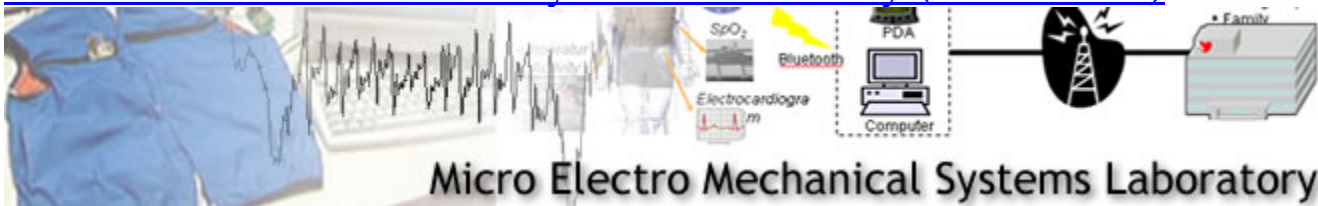


Micro Electro Mechanical Systems Laboratory (MEMSLab)



Bio-Monitoring Project - Development of Wearable Vital Signs Monitoring Sensors with Wireless Communications

The main aim of the project is to design and develop a wearable platform for vital signs monitoring – Biomonitoring, of the movement and condition of the body; using an array of sensors. The physiological monitoring systems involve body temperature, blood pressure, blood oxygenation and heart activity. The acquired data are processed and transmitted wirelessly via Bluetooth to the wearer's PDA for waveform display upon detection of abnormal signals or upon request (button pressing) from the wearer. The abnormal event will then be relayed to the caregiver or the family member.

MEMSWear II - Mission Critical Wearable Embedded Systems for Elderly Care

MEMSWear II is the extension of MEMSWear I; it leverages on the fall detection function from MEMSWear I into a faint fall prediction, faint fall onset detection, faint fall prevention and injury minimization system.

2 types of signals are collected: physical (by motion sensors) and physiological (by biosensors). The faint fall prediction module utilizes data continuously from the 2 sensors – SpO₂ sensor for blood oxygen saturation; ECG sensor for heart activity and integration of the SpO₂-ECG data to infer continuous Blood pressure. Abnormality in the physiological signals could help in predicting faint fall thus triggers the feedback mechanism of fall prevention module or the injury minimization module in the case of inevitable fall.

The motion sensors made up of gyroscopes and accelerometers. It accurately detects onset of faint fall and provide sufficient time for the activation of the feedback modules.

MEMSWear I - Incorporating MEMS technology into Smart Shirt for geriatric healthcare

Aims to develop a smart shirt (MEMSWear) for geriatric care. MEMSWear is incorporated with vital signs monitoring system and MEMS fall sensors. These sensors are able to detect fall with 100% accuracy and relay the fall event to the wearer's caregiver or relative. To prevent false alarm, the sensors consisting of accelerometer and gyroscopes are used to determine and differentiate activities of daily living (ADL) from a fall.