Unobtrusive Welfare Monitoring System

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Project Aims

To develop and demonstrate a pervasive home welfare monitoring system using unobtrusive sensors for early detection and automated reporting of deteriorating physiological health parameters and enabling independent living.

System Structure

Sensors integrated into the living environment of the person being monitored. Sensors communicate with a central base station for evaluation. Data fusion to combine information from many different sources to overcome reduced sensor mobility.

Unobtrusive Sensing

Implementation of sensors to obtain information equivalent to obtrusive and invasive technologies, allowing for minimal impact on user lifestyle. Implemented sensors are demonstrated in a comparative study with their invasive counterparts.

Comparison of (a) raw Load Cell data, (b) changes in Load Cell data, and (c) Actigraph data

Finding new ways of determining health through non-invasive sensing of accessible symptoms. Sensing of previously unused symptoms will replace symptoms only sensed through invasive methods.

Power frequency spectrum of (a) a simple snore and (b) an apnoeic snore from a microphone

Long Term Monitoring

Detecting patterns over a period of time allows for the observation of behavioural changes which may indicate illness. Illness affects behavioural patterns, so it can be inferred when a noticeable deviation from the normal behavioural pattern occurs. The system would learn the normal behavioural pattern for an individual through lifestyle monitoring and use this as a reference to detect significant deviations.

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