

Classification Method for Turnover While Sleeping Using Multi-Point Unconstrained Sensing Devices

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Abstract : Elderly population in the world is increasing, and consequently, their nursing burden is also increasing. In such situations, monitoring and evaluating their daily action facilitates efficient nursing care. Especially, we focus on an unconscious activity during sleep, i.e. turnover. Monitoring turnover during sleep is essential to evaluate various conditions related to sleep. Bedsores are considered as one of the monitoring conditions. Changing patient's posture every two hours is required for caregivers to prevent bedsores. Herein, we attempt to develop an unconstrained nocturnal monitoring system using a sensing device based on piezoelectric ceramics that can detect the vibrations owing to human body movement on the bed. In the proposed method, in order to construct a multi-points sensing, we placed two sensing devices under the right and left legs at the head-side of an ordinary bed. Using this equipment, when a subject lies on the bed, feature is calculated from the output voltages of the sensing devices. In order to evaluate our proposed method, we conducted an experiment with six healthy male subjects. Consequently, the period during which turnover occurs can be correctly classified as the turnover period with 100% accuracy.

Keywords : turnover, piezoelectric ceramics, multi-points sensing, unconstrained monitoring system

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