

Classification of State Transition by Using a Microwave Doppler Sensor for Wandering Detection

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Abstract : With global aging, people who require care, such as people with dementia (PwD), are increasing within many developed countries. And PwDs may wander and unconsciously set foot outdoors, it may lead serious accidents, such as, traffic accidents. Here, round-the-clock monitoring by caregivers is necessary, which can be a burden for the caregivers. Therefore, an automatic wandering detection system is required when an elderly person wanders outdoors, in which case the detection system transmits a 'moving' followed by an 'absence' state. In this paper, we focus on the transition from the 'resting' to the 'absence' state, via the 'moving' state as one of the wandering transitions. To capture the transition of the three states, our method based on the hidden Markov model (HMM) is built. Using our method, the restraint where the 'resting' state and 'absence' state cannot be transmitted to each other is applied. To validate our method, we conducted the experiment with 10 subjects. Our results show that the method can classify three states with 0.92 accuracy.

Keywords : wander, microwave Doppler sensor, respiratory frequency band, the state transition, hidden Markov model (HMM).

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