

Framework to Predict, Identify and Track Wandering behavior in Individuals with Alzheimer's Dementia using Various Physiological and Other Sensors and Kinects

Alzheimer's Disease is a neurodegenerative condition that affects over 35.6 million people worldwide and that results in the gradual deterioration of cognition and independent daily functioning. Wandering is a behavior found to occur in individuals with Alzheimer's Disease (AD) and is highly challenging to manage by caregivers. Wandering has been defined as an aimless pursuit in a state of disorientation. Even though wandering can lead to falls, physical harm, and in extreme cases death, this problem has been inadequately studied in the literature. In the gerontechnology literature, the limited body of work has proposed solutions with geolocation devices that explore mechanisms to identify wandering only after the behavior has started to occur. These studies can only assist in developing solutions that are reactive to wandering behavior. Unfortunately, none of the studies aim at prediction of the wandering behavior that can lead to proactive identification and prevention of this problematic behavior. Available studies have primarily utilized sensors in identification of wandering while it is happening and have not attended to physiological changes that may occur in individuals with AD before the onset of the wandering behavior such as a rise in heart rate, blood pressure, or body temperature. To address this gap in the knowledge base, we are proposing a solution that integrates a combination of wireless physiological sensors such as heart rate and blood pressure sensors, kinects, and infrared to predict, identify, track and monitor wandering in individuals with AD. This paper also explores various existing solutions that utilize mobile technology and gps location devices and then presents a framework for an all encompassing mechanism that can predict and identify wandering behavior.