2013

Fall risk assessment in older people using inertial sensors

Maryam Ghahramani  
*University of Wollongong*, mg846@uowmail.edu.au

Fazel Naghdy  
*University of Wollongong*, fazel@uow.edu.au

David Stirling  
*University of Wollongong*, stirling@uow.edu.au

Golshah Naghdy  
*University of Wollongong*, golshah@uow.edu.au

Jan Potter  
*University of Wollongong*, jans@uow.edu.au

Publication Details  
Fall risk assessment in older people using inertial sensors

Abstract
Abstract of paper that was presented at The 12th National Conference of Emerging Researchers in Ageing.

Keywords
assessment, older, people, sensors, inertial, fall, risk

Disciplines
Engineering | Science and Technology Studies

Publication Details

This conference paper is available at Research Online: http://ro.uow.edu.au/eispapers/2128
FAMILY MEMBER EXPERIENCES DURING AN OLDER LOVED ONE’S DELIRIUM

DAY Jenny¹, HIGGINS Isabel², KEATINGE Diana³

¹University of Newcastle

The research described in this poster explores the lived experience of family members who are with their older loved one during delirium. Based on phenomenology the study is concerned with describing the meanings of family member experiences during delirium in older people. Understanding the experiences of family members is important for the provision of support to family members and the appropriate involvement of family members in the older person’s care. The importance of healthcare staff and services regarding family members as integral to quality care and supporting them is highlighted in contemporary literature. Despite this acknowledgement, the experience, role and concerns of family members are often unknown or overlooked during the care of older people. Family support strategies have been suggested by some authors however there has been little exploration of family member experiences during delirium as a basis for these strategies, highlighting the importance of this study. The preliminary findings of the study are presented in the poster. Changing family portraits: Sudden existential absence during delirium depicts family member experiences of being with their older loved one during delirium. Existential absence for family members is experienced as suddenly losing the familiar presence of their loved one as a person, and the arrival of a stranger’s presence. These findings have the potential to increase recognition of the impact of older person delirium on family members, to increase recognition of the family within comprehensive care of the older person in the Australian healthcare system, and to inform further research related to family support and involvement in care during delirium. The study supports active ageing by understanding the impact of delirium on family members, often people who are older themselves, and suggesting the support they need to maintain wellbeing.

FALL RISK ASSESSMENT IN OLDER PEOPLE USING INERTIAL SENSORS

GAHARAMANI Maryam ¹, NAGHDY Fazel ¹, STIRLING David ¹, NAGHDY Golshah ¹, POTTER Jan²

¹School of Electrical, Computer and Telecommunications Engineering, University of Wollongong
²Illawara Health and Medical Research Institute, University of Wollongong

Almost 30% of people above 65 years of age fall each year all over the world. This figure increases to 40% for people older than 80. Falls have the highest percentage of injury-related deaths and fall related injuries have the highest cost after vehicle injuries. The mortality rate of fall increases dramatically with age and 70% of accidental deaths in persons above 75 are caused by fall. Fall in older people have many severe outcomes. Fall is the cause of 10% of elderly rushing to the hospitals and 6% of further hospitalization. The fall consequences can be physical such as fractures, as well as social such as isolation and depression. It is proved that frail elderly fallers display a significantly slower walking speed than non-fallers. Gait is a complex motor phenomenon with many other measurable facets besides speed that might identify fall risk. Walking speed, cadence, stride length and stride time are important factors which are significantly different between fallers and non-fallers. In addition, balance plays a key role in fall prediction. Keeping balance, an automatic process in healthy people, can be challenging for the elderly while doing daily chores. In this study, an objective method to assess the fall of risk in older people using inertial sensors is proposed. The data deployed in the study is obtained through MTw Development Kit from Xsens technology. MTw is a small, highly accurate wireless inertial 3D motion tracker consisting of 6 inertial sensors. MTW has many benefits compared to similar inertial sensors. MTw kit is completely wireless and portable which makes it very practical and easy to use. Data is collected in the Windows software package MT Manager. This software allows configuration of the MTW’s, real-time view of 3D orientation and sensor data, recording of data streamed from the MTW’s through the Awinda Station and export to ASCII files for further analysis. The kinematic data is subsequently used, using an intermediate program coded in MATLAB. Using the data, a stochastic method, based on Gaussian Mixture Model is used to identify deviation from normal gait. The results obtained so far indicate that the proposed method can assess the risk of fall caused by aging.