International Journal of Integrated Care ISSN 1568-4156
Volume 13, 20 November 2013
Publisher: Igitur publishing
URL: http://www.ijic.org
Cite this as: Int J Integr Care 2013; T&T Conf Suppl; URN:NBN:NL:UI:10-1-115710

Conference Abstract

Enhancing Independent Living with Wearable Devices: The Wrist Wearable Unit in the USEFIL Project

James David Amor

Christopher James

Vijayalakshmi Ahanathapillai

Correspondence to: ***James David Amor****, United Kingdom, E-mail: J.D.Amor@warwick.ac.uk*

Abstract

Introduction: There is a growing worldwide trend for people to live longer, with an increasing population of people aged 60 and over, which leads to two observations. Firstly, as the number of older people in the population increases, there is a corresponding rise in people with age related health conditions. Secondly, as the proportion of older people increases, the proportion of people able to provide care decreases. This creates a pressure on society to provide healthcare for its elderly population using relatively fewer resources, both human and financial.

The Unobtrusive Smart Environments for Independent Living (USEFIL) project aims to utilise established and emerging technology to address this problem by combining off-the-shelf devices to create an independent living system for older people. The USEFIL system will use sensors to monitor the older person and their health and feed this data into a decision support system (DSS). Outputs from the DSS will be used by the older person's carers to improve their level of care. The system will integrate into the older person's existing care and provide additional services such as fall detection and remote consultation. Within USEFIL, the University of Warwick is developing a wrist wearable unit (WWU). The WWU will provide a wearable platform for interacting with the older person and monitoring their health indicators.

Aims and Objectives: There are three requirement areas for the WWU, 1) sensing, 2) computation and 3) communication. Firstly, the WWU must provide some sensors to gather data for monitoring the user and their health status. Secondly, the WWU must process the data to extract basic features. Finally, the WWU must send the processed data to other parts of the USEFIL system. Furthermore, the WWU must offer some way to interact with the user and display information.

Methods: We are following a standard engineering process in the development of the WWU. A full requirements analysis has been performed followed by an examination of the devices on the market. Following the selection of a suitable device we are designing and implementing the software components of the WWU and developing new algorithms to run on the device.

Results: We have chosen the Z1 Watch-Phone as the platform for the WWU. The Z1 is an Android 2.2 smart-phone in a wrist-watch form factor and meets the key requirement areas.

International Congress on Telehealth and Telecare 2013, London, July 01-03, 2013.

Building on this platform we have developed the sensing components of the WWU allowing data from the accelerometer and GPS receiver to be gathered. Investigations into extending the battery life have resulted in the development of interval sampling and adaptive mode switching techniques which offer significant battery life extensions.

Conclusion: The Android Z1 is a viable device for the USEFIL project that allows us to monitor the physical activity and location of an older person. This information will be integrated with other inputs in the USEFIL DSS and ultimately improve the care of the older person. We have developed an initial data gathering framework for the Z1 and made some good initial progress extending the battery life.

Keywords:

assisted living, ageing, independant living, wearable, unobtrusive,

---

Presentation available at**:** http://www.kingsfund.org.uk/events/third-annual-international-congress-telehealth-and-telecare