Publications and presentations

Since our last newsletter, several scientific publications have presented some of the FARSEEING results:

- Palumbo et al. (2014) A probabilistic model to investigate the properties of prognostic tools for falls. Methods of Information in Medicine (under revision)
- Bourke et al. (2014) Temporal and kinematic parameters of real falls recorded on older adults using accelerometers attached to the lower back. ISPGR World Congress, June 2014, Vancouver BC, (in press)

Conferences & Events

Over the past 12 months, FARSEEING partners have presented at many different conferences including the 7th International Conference on Pervasive Computing Technologies for Healthcare in Italy; 2nd Joint World Congress of ISPGR and Gait and Mental Function in Japan; the IAGG in Seoul; 14th International Falls and Postural Stability Conference in the UK.

Some of the FARSEEING results shall be showcased at the EC booth during the eHealth Forum, Athens, May 12-14. Come and meet with us!

FARSEEING will be presenting a symposium at the ISPGR World Congress in Vancouver, Canada in June 2014. “Uncovering real-life falls”, Speakers: Clemens Becker, Steve Robinovitch, Stefania Bandinelli, Lorenzo Chiarì. Chair: Chris Todd.

The FARSEEING Taxonomy

One problem in interpreting results in the literature is that technologies have been undifferentiated and are not well described in reports. We have developed a taxonomy of falls related technologies that will be useful for researchers, clinicians and technologists to enable a “common language” for describing technologies being assessed. The FARSEEING taxonomy aims to “classify and describe studies which use ICT devices to detect falls, monitor or promote movement-related function and physical activity in fall prevention”.

The FARSEEING taxonomy and its accompanying handbook is available on the FARSEEING website in PDF format. An online web application has also been developed, in order to simplify the use of the taxonomy and is available at taxonomy.farseeingresearch.eu

The FARSEEING taxonomy is subject to a Creative Commons license and the terms of use can be seen at http://creativecommons.org/licenses/by-nc-sa/4.0/ We welcome comments on the taxonomy and foresee that it will change and develop with use.

Further information from Prof Chris Todd, chris.todd@manchester.ac.uk.
Work Package 2 - User perspectives and psychological aspects about ICT technologies for “ageing well”

The work package aims to develop how we can describe different technologies as they relate to falls interventions and independence promotion, in order help us understand what is effective. We also investigate what older people think of these technologies to help us design technologies which they will use.

Information about the FARSEEING taxonomy and the systematic review is provided on the front and back pages of this newsletter. Our knowledge about user perspectives has been feeding into the other work packages, as we help to develop the feedback and motivational messages for the technological interventions. In addition, we have been conducting a stakeholder consultation regarding attitudes to technologies and have published preliminary guidelines for design and implementation of technologies. These will be updated at the end of 2014 and we would welcome input from anyone with experience of working with older adults and technologies. Please contact elizabeth.boulton@manchester.ac.uk if you can spare an hour to give us your views.

Work Package 3 - Technological development

The aim of WP3 is to develop the FARSEEING architecture for collecting, storing and processing fall-related data:

- The smartphone Apps are developed for turning a smartphone into a companion not just a communication tool. The smartphone can monitor the user’s mobility and detect fall events in real-time, provide stimuli and feedback for supporting motivational and intervention strategies. Smartphones are also used for instrumenting clinical functional tests like the Timed Up and Go test.
- The Smarthome is equipped with a local processing unit which also controls and connects the other system components, from the home-automation system to the smartphone. It continuously collects and locally processes all the data and generates reports about mobility and behavior of the user.
- The Wearable Sensor: a novel wearable sensing unit specifically designed for long term monitoring. The wearable unit is used in clinical routine for high-risk individuals in different settings and conditions.
- The Fall Repository: the meta-database includes both clinical and instrumental data related to falls. The collected data is used for developing and validating a novel fall risk model for defining an evidence-based risk profile.

Work Package 4 - Implementation and operational validation of longitudinal monitoring for early prediction of changes in mobility, disability & falls

The WP is aimed to use longitudinal information on the physiological, clinical, functional, behavioural and environmental correlates of mobility collected in the InCHIANTI study to develop a predictive model of mobility, disability and risk of falls in elderly individuals and to conduct a pilot study aimed at testing the feasibility and validity of using the Smartphone technology to improve understanding of falls in older adults and to identify possible new targets for prevention.

At the present, data collection in the population-based scenario is still running (InCHIANTI Follow-Up 4, started in June 2013). 356 participants have been interviewed with 375 being assessed by a clinical visit and physical performance evaluation. Among them 263 (76 with age ≥65y) agreed to wear a smartphone for a week during daily activities. The collected data have been stored and shared with WP partners. Preliminary data (Pilot Study & InCHIANTI FU4) have been shown to partners by scheduled deliveries.

Work Package 5 - Telemedical service models

The work package aims at developing service models for fall management, fall risk assessment, and exercise guidance.

The far management model has been developed and is being tested in real-life in the municipality of Trondheim, Norway. As part of developing the fall management service model, staff and users of the existing fall alarm service were interviewed for stakeholder analysis. The perceived ICT challenges within the service were identified and a prototype of a future emergency alarm solution was provided. Within the fall management service model, we also analysed and evaluated the FARSEEING technological architecture. As part of developing the exercise guidance service model, we have performed usability tests of three existing exergames with older adult users. WP5 has written a report on existing telemedicine service models and a validation strategy of the fall alarm service.

Work Package 6 - Knowledge acquisition, consolidation and generalisation about falls through a meta-database

Based on the FARSEEING consensus recommendations, the FARSEEING meta-database was established including a web-frontend for user interaction. Since 2013, participants from population-based community-dwelling cohorts and a wide spectrum of different high-risk populations (among others Parkinson’s disease, cerebellar and sensory ataxia, Dementia and complex intellectual disabilities) have been recruited from several international recruiting centres. Further groups have planned to start recordings within 2014. So far, more than 200 real-world falls were collected and stored in the database. Over 2000 participants were measured, also using the FARSEEING ‘uSense’ sensor unit and the ‘uFall’ smartphone application. Other research groups with existing fall data or planned studies to collect real-world fall data are invited to join the consortium as members and associates.

Work Package 7 - Designing and testing a complex/self-adaptive intervention

WP7 focuses on the design and evaluation of self-adapted intervention programs with the aim of restoring/enhancing healthy functioning of older persons by acting at physical/psychological and cognitive levels.

Within the FARSEEING project WP7 endeavors to evolve and improve the main technological aspects of an independent living elderly person’s home environment. To this end a number of systems have been developed, both from expert opinion and from extensive literature review. Currently these are undergoing feasibility and usability testing, in order to assess and improve their suitability for assessing and restoring physiological complexity within this population. These include the development of a suite of sensors and customised touch-screen interfaces within the smart-home as well as a smart-phone. Both of these incorporate a motivational and persuasive strategy to motivate the user to be more active, but without taking risks, as well as a newly designed virtual reality stepping exercise intervention, which incorporates a novel smart-shoe based activity monitoring system. The combination of “Smart” body-worn and ubiquitous sensors, systems and interfaces will aim to both motivate and increase complex behavior, and assess if a realistic measurable change in physiological complexity occurs. The effectiveness of this self-adaptive complex intervention will be assessed in trials that will take place later this year.