CARE project summary
25. October 2010

General description
The CARE project is a R&D activity running under the Ambient Assisted Living (AAL) Joint Programme first call and is co-funded by the EC and by several European countries. The project aims to realise an intelligent monitoring and alarming system for independent living of elderly persons. Specifically, this project targets the automated recognition and alarming of critical situations (like fall detection) using a visual sensor and real-time processing while preserving the privacy and taking into account system dependability issues, especially ensuring reliability, availability, security, and safety from a holistic point of view. A biologically-inspired dynamic stereo vision sensor from AIT will be integrated into the Everon (alarm, security, and monitoring) system for seamless analysis and tracking of elderly persons at home. This real-time information can be exploited for incident detection (e.g., fall detection, immobilised person), and instantaneous alarming the concerned parties.

This initiative is an end-user driven R&D activity where end-users represent major market players in AAL activities as they are either elderly persons or they have direct relation and responsibility towards elderly persons ensuring their safety and independent living. The R&D consortium is well balanced where one third is research institutes (AIT, BME EMT), one third is SMEs (Everon, SensoCube) and one third is end-users (Senioren Wohnpark Weser in Germany and Yrjö & Hanna in Finland). Selected elderly homes of the partner end-users will be used for the evaluation and demonstration of the CARE concept.

### Project focus on fall detection
One of the highest risks for elderly persons living alone or spending much time alone is falling down (see illustration on the right) and being unable to call for help, especially in case of loss of consciousness. The main challenge in installing ICT-based monitoring systems is the balance between surveillance and privacy, i.e. home safety versus ethics. Hence, since privacy is a fundamental human right, any means for augmenting detection of critical situations in the living environments of elderly persons need to respect and ensure privacy. Falls can occur principally in all home locations and situations. Wearable tools currently used for monitoring elderly people are often

disposed in such situations, rendering them of little use for detecting potentially hazardous situations. As a consequence, "smart ambient" approaches, like vision-based surveillance, appear to be more appropriate for that purpose.
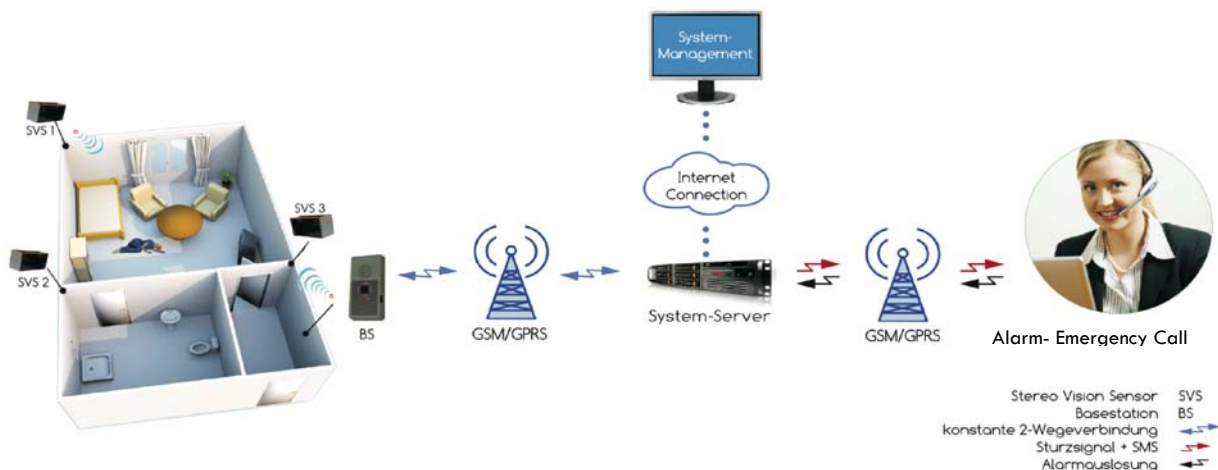
Project concept
In the early phase of the project, it was necessary to perform interviews of end-users and collect a list of services needed as well as to find out the most relevant and frequent critical situations encountered. More than 200 end-users (primary, secondary and tertiary) in Austria, Finland, Germany and Hungary were questioned. The interviewed end-users agreed that there is a definitive need for a fall detector at elderly homes and that the actual fall detectors (e.g. wearable systems) are not satisfactory. Based on these interview results, a list of requirements was created for the CARE ICT system with a focus on the person fall as the main critical situation. Architecture of the

biologically-inspired stereo vision sensor was designed and the sensor and algorithms for the detection of falls are under development. The CARE system is planned to be installed and evaluated in two elderly homes by mid 2011. The figure below shows an illustration of a person fall imaged by a standard video camera (left) and by a pair of biologically-inspired vision sensors (middle and right).
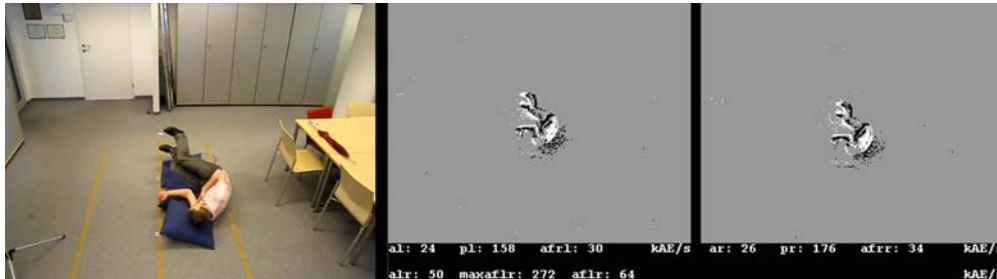
For the dissemination activities, a plan was set up. Project flyer, poster, newsletters and 5 press releases were performed to diffuse the project activities and progress. Furthermore more than five papers/posters on CARE technical aspects were published and presented in the first year of the project.

An illustration of CARE system deployment is depicted below showing the integration of the stereo vision sensor with Everon base station.

Project data

Title	Safe Private Homes for Elderly Persons
Acronym	CARE
Reference	AAL-2008-1-078
Coordination	AIT Austrian Institute of Technology (AT)
Partners	SensoCube GmbH (DE), Budapest University of Technology and Economics (HU), Oy Everon Ab (FI), Yrjö ja Hanna Kodit (FI), Senioren Wohnpark Weser GmbH (DE)
Start date	01. July 2009
Duration	30 months
Volume	2.38 M€
Funding	1.73 M€
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