Integration of Home Automation Technology into an Assisted Living Concept

Martin Floeck, Lothar Litz

Institute of Automatic Control, School of Electrical and Computer Engineering,
University of Kaiserslautern, Kaiserslautern, Germany
{floeck, litz}@eit.uni-kl.de

A brief overview over a real-world Ambient Assisted Living (AAL) project in Kaiserslautern, Germany, is given. It does not only incorporate scientific research but also involves the prospective senior users right from the beginning. The authors' perception of AAL is characterized as follows: The aspects of safety, comfort, health, and communication cannot be separated but need to be addressed simultaneously. To achieve this, only off-the-shelf home automation devices are used to limit the hardware costs. Every developer, however, should be careful not to overrate the capabilities of modern technology. To create AAL environments worth living in, social environments of the addressed AAL users must be identified and conserved in their new surrounding.

A Holistic Approach to Ambient Assisted Living

In our approach, four key fields of interest are identified: comfort, safety, health, and communication. These elements cannot be separated but are equally important for the prospective users of AAL technology. Thus, our AAL environment will comprise all the aforementioned aspects rather than focus on health maintenance only. Thinking about comfort and safety, an entry phone, automatic roller blinds, prevention of water damages, etc. can be cited as examples. The new scientific challenge, however, is combining the signals from various standard sensors, e.g., motion detectors and wall switches, to obtain knowledge about the health status of the inhabitant and possible medical conditions.

That is where PAUL, the **P**ersonal **A**ssistant **U**nit for **L**iving comes into play. PAUL collects and interprets all these data to assist the user in his daily life but also to monitor his health condition and to safeguard him. PAUL interprets the collected data using fuzzy logic, automata, pattern recognition, neural networks, etc. In addition, automatic alarm generation schemes will be implemented.

Because the AAL solution has been applied to a real-world scenario, two important constraints had been stipulated: First, the equipment must be reasonably priced. Second, the equipment must be reliable and technically mature. Both of these requirements are met by using standard home automation devices conforming to the KNX/EIB standard. Finally, connecting motion detectors, window and door sensors, light and roller blind switches etc. with a central control unit provides safety and comfort as well.

Dagstuhl Seminar Proceedings 07462
Assisted Living Systems - Models, Architectures and Engineering Approaches
http://drops.dagstuhl.de/opus/volltexte/2008/1459