

Towards Intelligent Home Caregiver

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The Statistical Office of the European Communities (Eurostat) predicts that the number of persons aged 65 and over expressed as a percentage of the projected number of persons aged between 15 and 64 in EU27 will rise from 17.9% in 2008 to 53.5% in 2060[1]. As health problems are often encountered with the elderly, the aging of population will overwhelm the society's capacity for taking care for its elderly members.

Research in the field of ambient intelligence [2] is gaining in popularity. Supported by a large spectrum of technological breakthroughs, the vision of systems that embed electronics in every-day objects and environments with the purpose of improving productivity, creativity and pleasure of people through advanced user-system interaction is becoming reality. This vision encompasses two aspects of intelligence – system and social. System intelligence refers to ability to determine the context in which the user performs activities, automatic adjustment of the environment to the user's personal settings, ability to learn from recurring situations and changing needs, as well as to pro-activeness of the environment. Social intelligence encompasses user-system interaction that is compliant with societal conventions, interaction concepts that exhibit awareness of inner state of emotions, as well as consistent and transparent behavior in the interaction with people which is recognized by the user as conscious.

Encouraged by recent advances in the field of ambient intelligence, the European FP7 project CONFIDENCE – Ubiquitous Care System to Support Independent Living [3] is developing a system that will monitor the health conditions of the elderly in real-time based on radio tags placed on the human body. In case of health problems, the system will issue a warning to the user and an alarm to the caregiver if necessary. This way the elderly should gain the needed confidence and security to continue their independent participation in society, thus reducing costs for medical services and burden to the working age population.

The Department of Intelligent Systems of the Jožef Stefan Institute is responsible for the design and development of two subsystems which form the core of the reasoning in CONFIDENCE. The first subsystem will reconstruct the user and his/her environment based on measured locations of the radio tags. The second will detect health problems and early symptoms of illness. This subsystem will have “intelligence” to learn from the habits of the user and adapt to changes in his/her behavior. State-of-the-art techniques (presented on the poster) are being examined and applied for developing the above mentioned subsystems. Study of fall detection and activity recognition with the use of machine learning is presented in [4].

References:

- [1] Eurostat. <http://epp.eurostat.ec.europa.eu>, 2009.
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- [3] CONFIDENCE. <http://www.confidence-eu.org/>, 2009.
- [4] M. Luštrek and B. Kaluža. Fall detection and activity recognition with machine learning. *Informatica*, 33(2), 2009. Accepted for publication.