

D. Guénaux, V. Ly, F. Hervieux. UbiQuiet: Fighting loneliness and analysing environment and habits as a whole.

Gerontechnology In 1950, 12% of the population in developed countries was aged 60 and older compared with 19% in 1998 and possibly 28% in 2025¹.

Meanwhile, the number of health professionals and home caregivers is lowering.

In France, there are 1,100,000 people older than 85 years. In 2015, it will be 1,900,000². The number of Alzheimer's ills are estimated at 650 000³.

These alarming figures reveal two other realities: elderly people will live longer alone and monitoring their home and habits will become a necessity. In this context, UbiQuiet is a non intrusive telecare solution that aims at offering independent living to its users by giving them the ability to stay in their home with little or no assistance from a caregiver^{3,4}.

This is achieved through three main functionalities: analysis of the user's environment to catch situations of immediate danger, detection of early symptoms of cognitive deficiency, and creation of a new communication medium between the users and their relatives.

Technical description Inside the house of a user, the system consists of a network of wireless environmental sensors measuring things like movements in a room, temperature, door opening, etc. A stream of sensor data is sent continuously to the data centre where it is analysed anonymously. Resulting from this analysis, alerts can be generated according to the rules defined previously by the UbiQuiet staff and the user's physicians.

These rules are based on different kinds of situations: single events that are interpreted as dangerous like a fall or a gas leak, and sets of related events that indicate a change of habit by the user. The alert is then sent to the telecare staffs that are in charge of taking the adequate measures according to the events that generated the alert. Thanks to the telecare giver's feedback, the rules can also evolve dynamically and better suit each individual's different behaviour.

After a learning period of a few days, the system becomes less intrusive as specific situations are identified as false alarms. Although they constantly evolve, the rules can be created by user's physicist, occupational therapist or relatives via an intuitive graphical user interface. For example, the first ones add rules that remind the user to take his/her medicine at given hours or checking the respect of a minimum amount of rest time each month, while the last ones can define a time period when the system temporarily shuts down because the user has to leave the house for a weekly appointment. While UbiQuiet gives its users the ability to live independently, it also provides an easy-to-use communication means for the elderly to keep in touch with their relatives, whenever they are far away.

This is done with a gateway presented as a simple box, providing smart features such as text-to-speech or voice recording. Thus, a text message sent by a relative will be vocalized on the box; then pressing a button on the box allows the user to acknowledge the reception of the message and possibly records a response. Finally, a web portal displaying the results of the user's environment analysis is accessible to the relatives and physicians so that they can get an overview of the user's status – no detailed information- and detect early signs of cognitive deficiency with the alert history.

User studies During 2009, UbiQuiet will be evaluated over 2 user populations: Alzheimer patients and elderly people living alone at home, by the Pole Allongement de la vie Charles Foix in Paris, France.

References

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Keywords: smart home, loneliness, habit monitoring, communicating objects

Address: UbiQuiet – 5 rue Salomon de Rothschild – 92150 Suresnes - France; E: dguenaux@ubiquiet.com

