

G.M. REVEL, L. SCALISE, F. PIETRONI, S. CASACCIA. **Measurement and classification of the home activities and health status of elders through data mining and feature extraction.**

Gerontechnology 2016;15(suppl):92s; doi:10.4017/gt.2016.15.s.932.00

Purpose An aging population need dedicated smart solutions to improve their quality of life¹, reduce the disease risks² and increase their safety perception. Nowadays, the use of miniaturized and non-invasive sensors is widely used and the quantity of heterogeneous information and signals coming from such devices is increasing consequently. However, the physiological interpretation of such data³ is not immediate, and sometimes not interesting for the user. The aim of this work is to provide a simplified tool to acquire, process and interpret data coming from several devices. This would allow the user to monitor multiple environmental⁴, physical and physiological quantities within their homes. The research work has been developed within the Health@Home Italian project framework, financed by MIUR (Italian Ministry of Research). **Method** A simplified graphical interface has been developed to acquire data from both domestic (e.g. temperature, humidity, door opening/closing) and biomedical (e.g. multi-parametric belt, blood pressure, pulse-oximeter) devices and store them in local and cloud databases. A measuring protocol at rest has been implemented, in order to facilitate the user during the acquisition phase and provide useful data to be compared and processed. **Results & Discussion** A prototype version of the system has been installed in a real home, with two middle-aged and healthy subjects (male: 65 years; female: 58 years). The interface developed is able to acquire and store quantities coming from the different sensors adopted. The data collected in the first month are being used to calibrate the system according to the user (i.e. basal values and deviations for the quantities measured). Then, dedicated processing techniques (e.g. data mining, features extractions, personal alerts) will be tested and validated. A large monitoring campaign is necessary to identify the best methodologies to assess the health status of the users from such measured quantities.

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Keywords: smart home, elderly people, user interface, data processing

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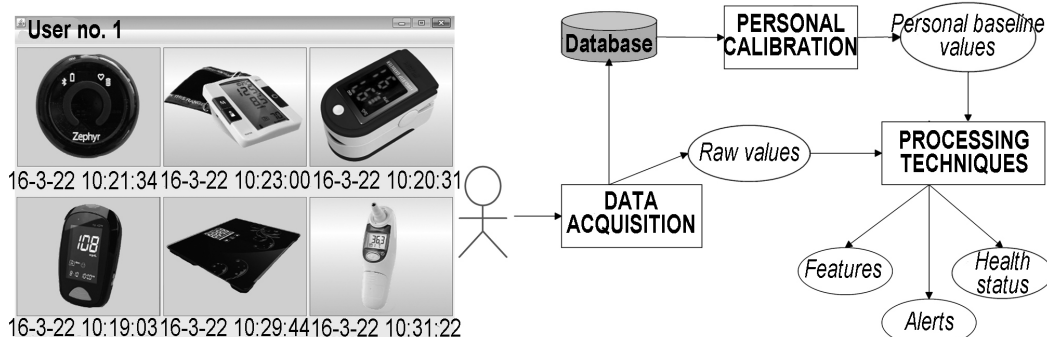


Figure 1. Left: PC graphical interface for the acquisition from the different sensors adopted; Right: Concept of the framework for the acquisition and extraction of features to assess the user's health status