

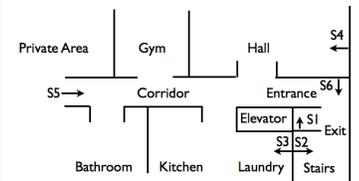
# Measuring People Activity with Smart Homes

Andres Albanese and Enrico Valtolina  
info@myhomevillage.com, enrico.valtolina@bticino.it

A smart home can continuously record and display values related to the activity of its dwellers (users), along with the electricity and water usage. Users can review their past data for a period of up to 2 years, in the privacy of their homes, using a touch screen display, or remotely, using the web server. With this implementation, we demonstrated the capability of smart homes to collect data inconspicuously, with the objective of keeping track of user activity for rehabilitation purposes and, in general, for the discovery of changes in normal behavioral patterns. This gives users an opportunity for comparing their data with health guidelines for rehabilitation and wellbeing.

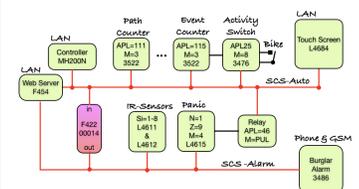
## Sensors:

User activity is translated into pulses to increase counter values. Motion IR sensors, door contacts, and water meters generate pulses representing user activity. For example, a static bicycle uses a magnet and a contact, as a rotation sensor, to account for the intensity of the exercise. A counter in the system records the frequency and time distribution of the pulses received. Electrical current sensors and webcams collect additional information to complement the activity data. All this data is stored in records containing date, time, and pulses received every hour during a period of two years, and is made available on user request.



## System:

Burglar Alarm, Automation, and Energy systems exchange information about events using OpenWebNet messages. The controller, web server, alarm station, and home assistance services work in synergy to process events and logical conditions, identifying incompleting tasks to initiate calls and send mails alerting providers or relatives.



## Display:

Activity patterns display the accumulated value of the pulses received from all sensors. Similar images display the distribution, in time, of electricity and water usage, that can be correlated with the activity patterns to discover unusual events. Example: water running in the bathroom for a period longer than usual after the person has exited. The web server categorizes each counter as positive or negative to show the balance of several counters in one image, similar to what is done for electricity.

