A. LOSARDO, G. MATRELLA, F. GROSSI, I. DE MUNARI, P. CIAMPOLINI. ***Indirect wellness monitoring through AAL environments.*** *Gerontechnology 2012;11(2):330;* doi:10.4017/gt.2012.11.02.492.00

Purpose In order to support continued independence of elderly people, great attention is paid to the home environment, and technologies have been introduced to make the home a safer and more comfortable place. Within the ambient assisted living (AAL) paradigm, the home interacts with users in many ways. Primary monitoring functions rely on dedicated sensors, while 'indirect monitoring' can be carried out by exploiting data coming from simple 'use' traces embedded in the system event log (such as motion, appliance activation, light switching, etc.). These data may conceal indicators related to wellness and to its changes over time; however, tools are needed to visualize data expressively and to extract meaningful trends. **Method** We extract data from the AAL-CARDEA[1] system, currently installed in a set of assisted-living facilities scattered over the Parma region, in northern Italy. We access the system's networked database, and specify an observation goal (e.g., a set of motion sensors, a bed sensitive pad, or any other device controlled by CARDEA). We then filtered and averaged the data to reduce data noise. Resulting data patterns can be exploited for simple activity recognition tasks, or to infer changes in the wellness status. **Results & Discussion** Experiments validated our approach. As an example, we show the activity pattern extracted over a 3-year period from presence sensors located into the bathroom of an apartment in which a 92-year-old lady lives (*Figure 1*). The grey scale indicates the activity amount (dark shades stand for more intense activity). The plot is organized so that circadian features can emerge: lunch and dinner times result in minimal activity, immediately followed by a peak. Peaks are also observed during wake-up time, which nicely follows the sunrise pattern. Activity at nighttime can be inferred by the bottom belt in the plot: although single events have little meaning, density changes can be easily appreciated, as shown in the figure. Analyzing such a subregion, a significant increase of the activity is found (shown in the figure inset) over a relatively short time. Such a change (activity almost doubles within a couple of months) is of evident relevance to the caregivers (e.g., suggesting to check drug prescriptions). On the other hand, if a daytime interval is observed, a much slower activity decrease (not shown in figure) is found, possibly standing for mobility decrease due to progressing osteoarthritis. Both situations were actually unnoticed by the caregivers, this highlighting the role that systematic monitoring tools may have in supporting their work.

References

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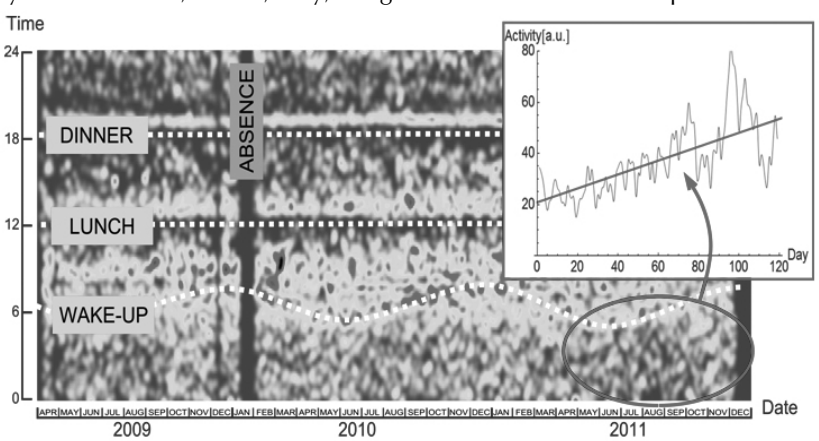

Figure 1. Inferred bathroom activity function