G. Virone, A. Sixsmith. Ambient-assisted living and in-home activity monitoring. Gerontechnology 2008; 7(2):231. The potential of new technologies developed to enhance quality of life and support independent living has rapidly progressed in recent years. In particular, recent R&D has aimed at conceiving supportive environments for older people based on the concept of 'ambient assisted living' (AAL) using pervasive Information and Communication Technologies (ICTs) to enable older people to live independently in their own homes. This paper presents a short review of the state-of-the-art in the area of in-home activity monitoring and assesses the social-technical implications implied in the development of AAL systems. AAL systems includes activity monitoring involving multi-sensor data acquisition in the home to monitor a person's movements and behaviours as well as the processing of this raw sensor data in order to make higher-order inferences about the person's activities and daily life patterns. Activity monitoring is essential in a whole range of potential applications, such as falls monitoring and the development of a new generation of smart environments to support frail and disabled people living at home. **Methods** The aim of this paper is to compare approaches, techniques and systems in order to identify common trends and highlight differences and to assess their implications for developing commercially available AAL systems. The review involved a search of the Medline database with the terms 'activity monitoring' and 'home'. Also, as this is a relatively new and rapidly changing area and much of the current research activity is accessible only within the 'grey literature' or within the commercial sector. The review therefore included a number of key R&D projects and systems known to the authors that are representative of R&D. The paper presents a system for analysing Circadian Activity Rhythm (CAR) to illustrate current research in the area[1]. **Results and discussion** Activity monitoring can be addressed in many ways. Passive or active, user-centred, cost-effective, invisible, measurement techniques are numerous. An illustrative example of activity monitoring for the AAL domain is the CAR software program. The method is based on a pattern mining algorithm that defines Circadian Activity Rhythm (CAR) from raw sensor data over a period of approximately three weeks. Deviations from this 'normal' pattern then generates 'alert(s)' that may be indicative of changes in the person's health or functional status or in their living situation. The CAR software (*Figure 1*) is programmed to detect the activity patterns of the following activities: sleeping, eating, meal preparation, hygiene, WC, dressing, cleaning, phoning, washing, walking, or sitting. These activity patterns were generated and scanned to identify behavioural deviations from the norm in accordance with preset simulated raw activity data. The potential scope of activity monitoring is enormous. Within the clinical domain, there is considerable emerging interest in the way activity data can be used for diagnostic purposes where detection of certain behavioural parameters may be indicative of changes in the status of conditions such as depression and dementia. In the area of basic research within gerontology, activity monitoring could be a source of new data about everyday activities that traditionally have been inaccessible.

References

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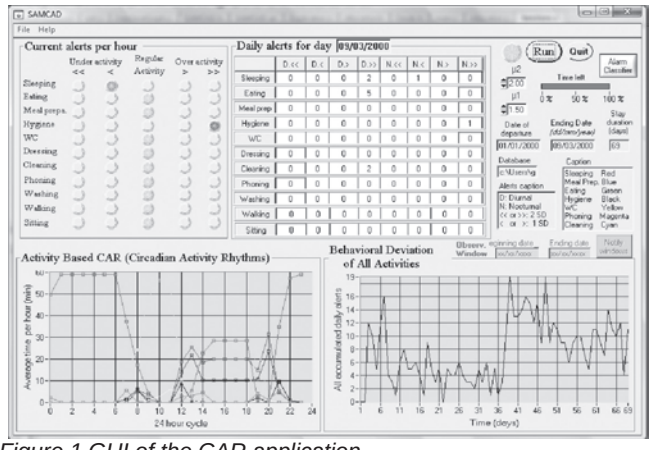

Figure 1 GUI of the CAR application