

TOWARDS REMOTE ACTIVITY MONITORING IN EARLY DEMENTIA AT HOME

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INTRODUCTION

- Dementia in the Netherlands will increase from 235.000 in 2008 (1 per 70 inhabitants) up to an estimated 500.000 in 2050 (1 per 34 inhabitants).
- Assisting technologies are needed to support care delivery in the home environment.
- Remote activity monitoring systems show the potential to support caregivers in providing home care to elderly with dementia by facilitating objective information on the activities of daily living (ADL) of these elderly.
- The challenge is to design a system that complies with the needs informal and professional caregivers of elderly with dementia. We describe user needs elicitation and development of a remote activity monitoring system.

Table 1 Results from 3 workshops on User Needs from professional and informal caregivers.

	Remote activity monitoring function	General ADL that both user-groups would like to have remotely monitored	Non functional requirements
Informal caregivers (n=8)	A reassuring tool, providing peace-of-mind.	1) mobility 2) use of household equipment	- security/privacy - unobtrusiveness for the demented person
Professional caregivers (n=5)	Objective information to support decision making in their profession of providing care.	3) medication intake 4) deterioration of health 5) social involvement 6) personal care 7) day structure 8) sleeping 9) eating and drinking	- cope with unpredictable behaviour of dementia - validity of information

USER NEEDS

In three iterating workshops we involved informal and professional caregivers of people suffering from dementia who live solitary at home. The workshops focused on: Eliciting global users' needs, Defining a first set of requirements in a scenario analysis, and Evaluating mock-ups of user interfaces. The results are summarized in Table 1. Functional requirements were defined on a high abstract level (e.g. quality of sleep) and participants had difficulty quantifying the measures and defining the needed representation of the information (e.g. quality of sleep can be represented by measures like: sleep duration, number of night walks, or duration of wake ups).

DEVELOPMENT OF A REMOTE ACTIVITY MONITORING SYSTEM

Next, we developed an unobtrusive wireless remote activity monitoring system. A house was equipped with the sensor system and multiple video cameras as a gold standard. Five healthy subjects lived each five days in this house. Figure 1 shows the experimental setup of all sensors, sensor types, and video cameras. Figure 2 shows a timeline in which the measured activity pattern of a subject is given, focussing on sleep, toilet use and preparing food. This information will be tailored to the user needs of both informal and formal caregivers.



Figure 1 Experimental setup of sensors in the house. Left = upstairs; Right = downstairs.

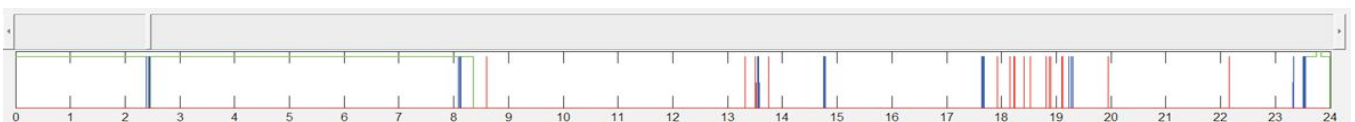


Figure 2 Example of activities registered by sensors from 1 subject during 24h. Green = Sleep; Blue = Toilet use; Red = Use of refrigerator or cutlery drawer.

