

From Surveillance to Assistance: Optimizing Care of Dementia Patients by Intelligent Behavioural Analysis. Introduction into Opdemiva* as a Diagnosis-related Ambient Assisted Living (AALI) - System.

B.S.A.J. Voigtlaender and Schneider¹, M. Findeisen², L. Meinel², G. Hirtz², T. Barth³

¹Department of Psychiatry Behavioural Medicine and Psychosomatics, Klinikum Chemnitz, Chemnitz, Germany ; ²Department of Electrical Engineering and Information Technology Professorship of Digital and Circuit Design, TU Chemnitz, Chemnitz, Germany ; ³Department of Psychiatry Behavioural Medicine and Psychosomatics, Klinikum Chemnitz gGmbH, Chemnitz, Germany

Introduction: In the course of demographic change an increasing number of dementia patients is predicted. More elderly desire to remain longer self-determined at their familiar domestic surroundings while declining disposability of nursing staff is prognosticated. Modern AAL-systems offer the opportunity to tackle this challenge.

Objectives: In order to meet the needs of dementia patients, a prospective AAL-system should discern people's activities of daily living (ADLs). Regarding to their complexity, in order to generate sophisticated assistance, the system needs to integrate harmonically into the domestic environment without any interference on ongoing activities of those concerned.

Aims: OPDEMIVA ascertains possibilities in real-time-recognizing of ADLs applying innovative contactless optical measurement sensors with focusing on the detection of high-risk behavioural patterns.

Methods: An interdisciplinary research team of technical and health-care experts was involved in the mutual project. Based on examination of the list of ADLs and preconceiving both aspects of medical importance and technical feasibility, a subset of relevant behavioural patterns was identified. An appropriate technical system based on optical smart sensor technology for ADLs detection was developed and preliminarily tested.

Results: In preliminary tests several fundamental ADLs, e.g. movement and recreation could be detected with high reliability while possible deficits like motionlessness over a defined period became derivable.

Conclusions: Smart sensor based detection of dementia-related high-risk behavioural patterns requires extensive detailed examination of capabilities and needs of persons concerned. Patient's privacy and ethic concerns are of high relevance. Results gained as yet imperatively demand further research.

*sponsored by funds of the European Regional Development Fund (ERDF) and the Free State of Saxony