

Ambient Light Guiding System for the Mobility Support of Elderly People

¹Kempton, G., ²Seyringer, H., ³Pohl, W., ⁴Ulmer, T., ⁵Atz, H. & ⁶Nedopil, C.

¹Guido.Kempton@fhv.at, University of Applied Sciences Vorarlberg (A), ²Heinz.Seyringer@zumtobel.com, Tridonic GmbH & Co KG (A),

³Wilfried.Pohl@bartenbach.com, Bartenbach Lichtlabor GmbH (A), ⁴Tom.Ulmer@myvitali.com, myVitali AG (CH),

⁵Hermann.Atz@apollis.it, Institute of Social Research and Opinion Polling OHG (I), ⁶Christoph.Nedopil@youse.de, Youse GmbH (D)

Orientation in time and space, is very decisive for elderly's mobility (Chang et al., 2010). People with problems in spatial and temporal orientation often do not know where and in what role they are at specific time of day, and on to what needs to be done next. Loss of spatial and temporal orientation may appear separately, or in total as a symptom of different age-related disorders or diseases. This symptom typically goes along with non-directional mobility, complete immobility due to fear of confusion, inability to structure everyday life, and very high demands on caregivers.

Lighting wayguidance systems cannot just assist orientation in space but also orientation in time (Figueiro et al., 2011). This is why we will develop, tentatively implement and empirically evaluate an intelligent lighting assistance for maintaining and improving indoor and outdoor mobility of older people at different stages of ageing process and to prepare it for market launch. This system will include an intelligent control loop for home automation, that supports navigation, consolidates personal circadian rhythm, and individually directs attention in a timely manner through automatic light quality and quantity variations and other ambient stimuli coding.

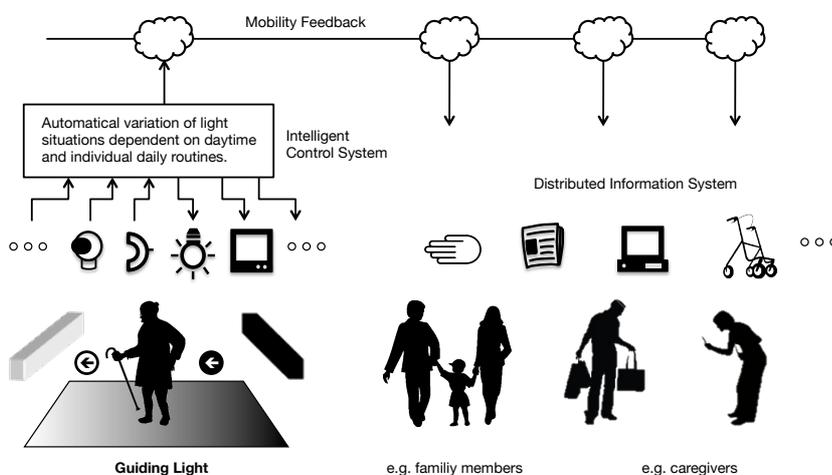


Figure 1. Basic components of Ambient Light Guiding System

We will realize this goal within Guiding Light, a granted project of the ongoing AAL JP (AAL-2011-4-033), in order to respond to the challenges of demographic change of our society. We not only expect to achieve more directed mobility with the assistance of guiding light but also a better structuring of activities of daily living within ageing population. Combined with a distributed information system for feedback about nature and extent of individual mobility, the system will likely lead to better care services too.

Existing light management systems on market are made to assure visual performance, to give navigational support, and rarely to influence circadian rhythm of humans. Lighting industry has designed lighting solutions especially for the needs of senior residences too. Nevertheless, there is no personalized light wayguidance system on the market, which continually adapts the light quality and quantity to the individual mobility needs of older people. There is also no application on market, which combines guiding light with an information system about personal mobility and related psycho-motoric variables influenced by light.

When developing Ambient Light Guiding System, we will thoroughly apply the principles of participatory and iterative design, which means that the end-users will be involved at all stages of product development. This includes understanding the context of use, specifying the user and care service requirements, developing prototypes, and evaluating designs with elderly against requirement (Hazzam et al., 2011). Besides, we apply a design-for-all approach in usability and accessibility optimization which will greatly enhance the potential for commercial exploitation because it extends the group of beneficiaries to include anyone desiring a higher quality of life.

References

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