

---

# Seeing the Light in INNOVAGE: Eco-Smart Independent Living for Elderly

**Sara Eriksén**

Blekinge Institute of Technology  
Dept. of Creative Technologies  
SE-371 79 Karlskrona, Sweden  
sara.eriksen@bth.se

**Jenny Lundberg**

Lund University  
Dept. of Design Sciences  
Box 118, SE-221 00 Lund, Sweden  
jenny.lundberg@design.lth.se

**Abstract**

An aging population in Europe poses challenges concerning the design of smart living spaces that can support and enhance independent living for elderly people. INNOVAGE is an on-going European INTERREG IVC project which aims to increase the effectiveness of regional development policies in the field of eco-smart independent living for elderly. This calls for new, interdisciplinary and use-oriented approaches to the design of electromechanical systems merging mechanical and electrical control systems, embedded software design and Human-Computer Interaction design. Recent research indicates that indoor lighting which simulates daylight can contribute to sustaining a sense of structure, coherence and pleasure in everyday life for elderly people and thus to some extent compensate for failing sight and memory. Smart, contextually aware lighting solutions offer exciting new possibilities in this area.

**Author Keywords**

Eco-smart home, independent living for elderly, participatory design, smart lighting

**ACM Classification Keywords**

H.5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous.

## **Introduction**

The authors of this position paper are researchers with a background in Computer Science, Informatics and Human Work Science. We are currently involved in a European project which aims to increase the effectiveness of regional development policies in the field of eco-smart independent living for elderly people. The aim of developing regional knowledge and innovation clusters in the field of sustainable smart home solutions is combined in this project with the ambition of providing personalized healthcare, homecare and assisted living options for elderly people, making it possible for them to keep living in their own homes rather than having to move to special institutions for the elderly as they get older and need more support in managing everyday life. This calls for new, interdisciplinary and use-oriented approaches to the design of electromechanical systems merging mechanical and electrical control systems, embedded software design and Human-Computer Interaction design. It also requires innovative cross-sector collaboration between researchers and central stakeholders in the public and private sectors, especially in the healthcare sector and in lighting, embedded sensor systems, applied health technology and the building industry.

Recent research [1] indicates that indoor lighting which simulates daylight can contribute to sustaining a sense of structure, coherence and pleasure in everyday life for elderly people and thus to some extent compensate for failing sight and memory. There is, however, a need for further research in this area, where design- and use-oriented research could certainly play a more prominent role than it has so far. Smart, contextually aware lighting solutions seem to offer exciting new possibilities for designing eco-smart and supportive

environments for elderly. In future, we hope to explore these possibilities further, using a participatory design approach, in collaboration with industrial and health-care sector partners and with elderly people in their home environments.

## **The INNOVAGE Project**

The INNOVAGE project, which is a three-year (2012-2014) European INTERREG IVC project involving 14 European regions, aims to help older people live independently for longer in their own homes by increasing their autonomy and by supporting the development of new technological supply chains associated with new developments such as independent living and eco-innovation. [2] The goals which have been set up within the project in order to achieve this aim are the following:

- Increasing the effectiveness of regional development policies in the field of eco-smart independent living for elderly
- Strengthening connection among actors, win-win collaboration and exchange of good practices at an interregional level
- Creating a European network of clusters on eco-smart independent living to share experiences and knowledge in this area

The regional networking, with the aim of supporting emerging clusters of relevant stakeholders and identifying existing regional good practices, has been significantly reinforced by the interregional networking activities, study visits, knowledge exchange workshops and interregional training sessions that constitute the

procedural backbone of the INNOVAGE project on a European level.

In 2012, during the second INNOVAGE study visit, which was hosted by the Netherlands Organization for Applied Scientific Research TNO, we saw examples of on-going collaboration between industry partners and university based researchers with a specific focus on developing new approaches to lighting for independent living for elderly. We were especially impressed during this study visit with the ambitions presented by our hosts of achieving long-term closer and better informed collaboration between research, healthcare sector and industrial partners through development of concrete living environments which were being tested by actual users living there for limited periods of time. Furthermore, we seemed to be witnessing an on-going shift in the Netherlands in how architects and building industry partners were collaboration in this area, with the explicit aim to develop practices of iterative, use-oriented design that could make efficient use of formative user evaluations and feedback in continuing design in use of supportive living environments.

### **Lighting for Sustainable Development**

The study visit in the Netherlands helped us see the light; that is, it opened our eyes to the importance of lighting for quality of life in elderly living environments. Once back in Sweden, we discovered that there was on-going interdisciplinary research on lighting for sustainable development, health and well-being on our home turf, at Lund University. [3]

*“The key issue to provide appropriate guidance for renewal of the lighting sector is to clarify what good light is, in various situations and for diverse purposes.*

*There is a need to improve and make better use of light-related knowledge from different sciences through interdisciplinary collaboration and translational research. The primary focus in the suggested translational research is to develop the interplay among research processes, learning processes in society, innovative developments of applications and policy-making. It is important to interpret the societal need for various kinds of light related knowledge and to translate this understanding so that it can be used as guidance for further advancement of various kinds of translational and basic research.” [3: p.10]*

The NordiCHI 2014 workshop “Beyond the Switch: Explicit and Implicit Interaction with Light” fits nicely into this picture and would provide an excellent opportunity for networking in this area.

### **Acknowledgements**

We thank our partners in the INNOVAGE project for all the generous knowledge sharing, excellent learning opportunities, valuable insights and inspiration they have provided us with in the area of eco-independent living for elderly. We also gratefully acknowledge the European INTERREG IVC program funding which has made our research in this area possible.

### **References**

- [1] Shikder, S., Mourshed, M. and Price, A. Therapeutic lighting design for the elderly: a review. *Perspectives in Public Health*. (2012)
- [2] INNOVAGE website. <http://www.innovage-project.eu/> accessed August 21<sup>st</sup> 2014.
- [3] Karlsson, R., Laike, T. and Samuelson, L. (2011) *Flervetenskaplig ljusforskning*. Pufendorf Institute Report Series No 1, Lund University