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**Contents**

**Introduction**

Dementia is one of the main societal challenges we will face in the near future. Partly due to the aging society, the number of people with dementia is expected to double in the next twenty years (Wimo et al., 2006). Currently, due to budget cuts in healthcare, the care for people with dementia is already challenging, putting a heavy burden on informal caregivers (often a family member or spouse). So you are not only going to design for people with dementia but for all people living with dementia.

Often people have an image of dementia that they are helpless and disorientated; yet there is long progress preceding this. On average there is a period of 3 years between the first symptoms of dementia and an official diagnosis, subsequently there is period of 2-4 years elderly can live at home. Additionally there is still a major taboo on dementia and people often neglect it and don't seek support. This precisely a scenario we wish to address in this project!

**Design challenges**

This project focuses on aiding these people in their everyday lives by social design. Design is able to support people living with dementia via innovative approaches, and it is up to you to find a creative angle to tackle this challenge. These can be products, systems and/or services that support people with dementia and/or their caregivers and contribute to their quality of life.

Societal challenges are inherently complex and networked problems, which cannot be addressed by concepts in a vacuum. Therefore we ask students to make intensive use of the available network, and to continuously monitor the potential and impact of their design. Key approach in this project is participatory design, co-reflection with stakeholders and putting the design in a greater social context (Suijkerbuijk et al. 2014). To aid students in this project we selected three focus areas, these are: Living Environment, staying active and meaningful activity. Only together we can address this challenge.
Contribution to the mission of the department
This project contributes among others in two major ways to the mission of the faculty. First, the university wide strategic area health and wellbeing is the core of this project. Dementia is a societal problem, which we as a society need to address in various ways in the near future. Second, the network behind this project work according to the Living Lab principles (Bergval-Kareborn et al. 2009) and aims to expose users to the innovations in a real life context. Again across the university, and in this department, Living Labs are a key research topic. For students this provides easy access to users (in this case elderly with dementia and their caregivers) with support from the entire network.

Bio lecturers
Rens Brankaert - graduated from industrial design in 2012 and he is currently working on his PhD at the Eindhoven University of Technology, department of Industrial Design. The topic of the PhD bridges design and healthcare in the context of dementia. Simultaneously he operates as operational manager for the Innovate Dementia project, together with GGzE, Brainport Development and Gemeente Eindhoven. The focus of the project is setting up a Living Lab to design and develop assistive technology and services for people with dementia and their caregivers in their natural context.

Cindy van den Bremen - Empathic Design & Cultural Diversity
Cindy has been involved as a coach within the Innovate Dementia project for many years. The user and human is the starting point in all her projects. She works in co-design projects, involving people from their expertise and throughout the process. Not only stakeholders and/or multidisciplinary teams, but also end users and local residents for instance. From an empathic and socio cultural perspective she uses her expertise to help the students develop both the project and themselves as a designer. Bringing the experience and expertise from the working field within the university.

Description of partners and their contribution

Industry partners:
Brainport Development (slimmer leven 2020 network) – Is a large network in the Eindhoven region focused on intelligent care with more than 15 regional care organizations, more than 10 wellbeing organizations, more than 20 industry partners and the most important public organizations like the TU/e.
http://www.slimmerleven2020.org
A strong cooperation during the Dutch Design Week at the World Health and Design Forum strengthened the connection between TU/e and slimmer leven 2020 opening up opportunities for investment and expertise in new innovative concepts.

Three SME’s in healthcare for elderly with different focus for potential cooperation and material support: GoLivePhone and GoCiety is an ICT service platform with custom mobile interface for elderly, Qwiek is an experience focused company with the mission to get elderly moving and OpenRemote is an American company that focuses on making the living environment of elderly more intelligent and thus convenient.
<table>
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<tr>
<td><strong>Care organizations:</strong></td>
<td>Seeing the First-Person Perspective in Dementia: A Qualitative Personal Evaluation Game to Evaluate Assistive Technology for People Affected by Dementia in the Home Context (2009). Sandra Suijkerbuijk; Rens Brankaert; Yvonne A.W. de Kort; Liselore J.A.E. Snaphaan; Elke den Ouden. Interacting with Computers 2014; doi: 10.1093/iwc/iwu038</td>
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<tr>
<td>Geestelijke Gezondheids zorg Eindhoven – At the core of the Innovate Dementia Living Lab GGzE and TU/e have strong connection. This is show in monthly focus groups with elderly with dementia (10 – 20 participants) and easy access to care professionals.</td>
<td>Living Lab: an open and citizen-centric approach for innovation. International Journal of Innovation and Regional Development (2009). Bergvall-Kåreborn, B., and A. Ståhlbröst. 1(4), pp. 356-370.</td>
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<tr>
<td>Land van Horne – Care organization from the north of Limburg got interested in more student-care institute interaction after a successful design track of the experience music pillow by Eriano Troenokarso. Nominated for the best care idea of the Netherlands 2014. <a href="http://www.hetbestezorgidee.nl/">http://www.hetbestezorgidee.nl/</a></td>
<td>Or take a look at our website: <a href="http://InnovateDementia.id.tue.nl">http://InnovateDementia.id.tue.nl</a> to get inspired by work from other students in the area of dementia.</td>
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<td><strong>Possible deliverables (in discussion with student and coach):</strong></td>
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**Description**

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<td>Harm van Essen</td>
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<td>Ewelina Schraven, Rob Zimmerman</td>
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| Learning objectives | Main competency development target
FS  UFP  SCA  DBP

*Team/individual*
Suitable as team project, not as first year project.
*Targeted blocks : B2; B3.2; M1.1; M1.2*

**Contents**

**Introduction**
Light allows us to live. But it also regulates our biorhythms, unconsciously directs us, and informs us of the time. Mankind has hardwired relationship with light.
Nature is inspiring, relaxes us and is vitalizing. No wonder nature is an important inspirational source for products, architecture and music. Different technologies give us the possibility to connect us with nature and to design products with a natural appearance (biomimicry, ecodesign etc.).
In the world of artificial illumination there is still a huge separation between natural and artificial light. Architects love using natural light, but what about the use of natural light in product design? After dark we just switch on the lights; For natural light after dusk candles and fire places remain... Recent developments on lighting (color, dynamics) give us the possibility to design with artificial light. This raises the question on how to design with light to create a natural appearance: artificial light based on the qualities of natural light.

**Design and research challenges**
As a starting point, this project focuses on how to design meaningful artificial lighting based on the everlasting beauty of natural light. Light is, like sound and smell, a natural phenomenon. We are able to describe light in physical terms (wavelength, intensity, etc). We can play with colors by changing hue, saturation and brightness. With these quantitative aspects of light we can describe and communicate with light. But when designing with natural or artificial light these terms are insufficient. It’s not possible to describe a natural light experience in physical terms. Qualitative terms of natural light help us to understand natural light in a better way. Such qualitative terms are for instance association, meaning, dynamics, or appearance. Based on an understanding and a classification of these “aspects” that are recognizable in natural lighting, you will design and research artificial lighting conditions and evaluate the natural appearance.
You will select a subject that fits best your education or inspiration.

- Designing a functional natural light experience/service/product for a specific context is an important design challenge. You’ll make use of existing research and available tools to enhance the experience. Prototyping and user testing will be an important part to check the natural appearance of your design.

- Exploration and validation of the qualitative terms of natural light is an important research challenge. Ongoing research in the Intelligent Lighting Institute aims to understand and classify the qualitative aspects of natural light. In this research project you contribute to the development and validation of the qualitative aspects of natural light and procedures. Tools will be developed on how to apply this knowledge in the design of artificial light. In this track you deliver new insights, formulated in a report and or a research paper.

**Deliverables:** demonstrate an installation/light product illustrating a selected quality, formulate insights and findings in a final report, reflect on process with intermediary findings of the different iterations. To allow quick and full-scale prototyping, we facilitate feasibly conditions and equipment in the light studio.

**Design process:**
An important part of this project is making and experiencing. Light can only be evaluated by seeing and experiencing. Therefore you will iterate your installation or product with ‘physical-somethings’; quick ready-made prototypes to check your findings. The design process for this project is different to other projects. The following steps will help you to develop your product:

1) pressure cooker to explore natural light and to define the qualitative terms you are going to use in this project (2 weeks). Deliverables: Natural light research, mood-boards on qualitative terms, physical exploration and working installation.

2) User research to check the experience. Redefining of the qualitative terms

3) Drawing conclusions and reflection. Propose a project (needfinding, client, context)

4) Research your project proposals: benchmark, feasibility, program of requirements

5) Development product or service (idea generation, concept development, materialization

6) Working prototype

7) User research

**Course Material**

**References**

[1] [www.openlight.nl](http://www.openlight.nl)


[3] [http://jacobalkema.nl/books.htm](http://jacobalkema.nl/books.htm)


**Title**
*Light Challenge 2015*
“New light on the inner city”

**Responsible Lecturer(s)**
Ewelina Schraven and Harm van Essen

**Contents**

*Introduction*
The Lightchallenge is a bi-annual national competition to design for innovative streetlighting. The challenge is supported by a number of companies and municipalities. Design teams of students are coupled to participating Dutch cities, spread over the country. See [www.lightchallenge.eu](http://www.lightchallenge.eu) for more information.

*Design challenges*
Since long, street lighting systems are owned and managed by municipalities. Modern LED lighting and advanced infrastructure and control systems offer new opportunities for street lighting that go beyond mere functional lighting for a safe transit space. Light can become dynamic and adaptive to the specific environment, support specific activities or messages, or even become truly interactive for both inhabitants or occasional passers-by.

The topic of this edition of the Lightchallenge is “new lights on the inner cities”, the aim is to contribute to local issues and opportunities in particular areas or streets in the contributing cities. Which developments and trends can be recognized and how do you envision a sustainable and livable inner city in 2050? Examples are found in city marketing, connectedness, shops’ opening hours, parking, safety, routing etc. With input from municipalities, inhabitants, and stakeholders, teams of students are challenged to design and demonstrate an innovative light concept, seamlessly integrated in particular part of a city. The role of the designer is to understand the various stakeholders, and to integrate seemingly opposing needs into an attractive solution that increases the quality of nightly city life. Stakeholders are especially the inhabitants and other users, but also the manufacturers, and the exploitation departments of the municipality. The design of street lighting systems is no longer just a technological design process, but it becomes more and more a social
design process. Therefore ethical design issues become apparent.

*Description of partners and their contribution*

The challenge is supported by a number of companies, municipalities, and institutes. Each team of students will be connected to one municipality and multiple companies. By an attractive program of workshops and coaching, the Lightchallenge offers students access to new technologies, to realistic context and adequate support by city managers. A renowned jury determines the winners. The Intelligent Lighting Institute of the TU/e is one of the contributing partners in the challenge. Together with Philips we offer a day of workshops for all participating teams. In the previous edition one team of our Industrial Design department joined the competition and has won the challenge!

*Possible deliverables:*
- Report
- Prototype
- Video
- Presentation

*Preliminary program:*

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<td>Kick off Light Challenge in Heerenveen</td>
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<td>11 februari 2015</td>
<td>Stakeholders kickoff in selected municipality</td>
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<td>18 maart 2015</td>
<td>Workshop /symposium at TU/e</td>
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<td>Eindhoven</td>
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<td>8 april 2015</td>
<td>Workshop /symposium at IBM Amsterdam</td>
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<td>22 april 2015</td>
<td>Feedback opportunity with stakeholders in municipality</td>
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<td>Mei 2015</td>
<td>Draft deliverables deadline</td>
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<td>Mei - Juli</td>
<td>Feedback by the jury (Utrecht)</td>
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<td>2 juli 2015</td>
<td>Prototyping Phase -</td>
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<td>all teams</td>
<td>Finale, exiting evening program in Nijmegen where</td>
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<td>cities, other</td>
<td>present their results to the all partners (companies, teams) and of course to the jury!</td>
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*Course Material*  

References

For more information please check [www.lightchallenge.eu](http://www.lightchallenge.eu)
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**Team/individual**
Teams can split up and each focus on parts the process to be designed. Individual students can focus on either of the two as well, but are allowed to have only one part of the scenario implemented as a working prototype.

**Contents**

**Introduction**
The sun sets after a lovely day at the beach, but the magical moment is broken as people take selfies with their back towards the setting sun. The queen shakes hand with distinguished individuals during an annual award ceremony and many of them are busy taking pictures with their phones rather than attending to her. A chat with a friend is interrupted when he goes through his phone to find the photo matching the funny story he tries to tell, the photo is lost and so is the storyline.

People will always be eager to capture their experience for later reminiscence. As the examples illustrate, media-technology can support us by capturing our experiences, but it can also get in the way of our experiences. Interacting with media-technology influences the way we experience, and remember events.

Artists such as John Mayer and Prince have spoken against phones and capturing during concerts for their influence on people’s experience.
More and smarter media-technologies are emerging. With the transition towards digital photography and the advancement of smartphone technology even more media can be captured and made available for retrieving, including media such as video, audio, text-messages or GPS data.

Media can have e.g. informative, aesthetic or artistic value, but in this project you will focus on the value of media in the complex process of remembering. In this process media can serve as a cue, a trigger that helps to reconstruct a memory. When it comes to media people engage in all kind of interesting interactions such as capturing, sharing, retrieving, and organizing. How can we design these interactions to support reliving our experiences? Are we using all the different media types to their full potential? How can we involve our senses in experiencing and remembering? Will recording everything we do enable us to recall everything we want?

Design Context: A Day Out
Practices around media for remembering are especially visible in a touristic context. For instance souvenirs shops, travel journals or location based media such as on-ride-photos in amusement parks. For this project we focus on media interaction surrounding a day out. Within this context you could focus on a specific type of entertainment (amusement park, city visit, wedding, festival) or social context (a date, a day with the family, a group of friends, etc.). This context provides an opportunity to explore behavior and make design interventions.

Design challenge
In this project you will design new media technologies to live and relive the experiences of a day out. Designs that support us to (re)create, modify, view, share or express the moments we want to remember. The challenge focuses on exploring how interacting with technology influence both the experience and the way we remember it.

Deliverables
We expect you to develop a concept based on a specific scenario, observation or experience within the context. Deliverables include an experiencable prototype and in-context user evaluation.

Bio lecturers
Ine Mols studied Industrial Design at the TU/e, where she obtained both her Bachelor and Master degree. In august 2013 she continued her path at the TU/e by joining the Materialising Memories Phd-team. Within the project she focuses on media creation for personal reflection.

Mendel Broekhuijsen has a background in Industrial Design, with both Bachelor and Master degrees obtained from TU/e. In June 2013 he started his PhD research on the Materialising Memories project. Within the project he focuses on the curation of personal digital photos.

Description of partners and their contribution
This project will be part of the project Materialising Memories, a 5-year NOW-funded research project. At TU/e two PhD candidates are working full time on the project within the User Centered Engineering group. They will be among the experts for this project. Materialising Memories is an international collaboration between TU/e and
**University of Technology Sydney (UTS). TU/e is a Key Technology Partner of UTS, which means you can also consult experts at UTS.**

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<tr>
<td><strong>References</strong></td>
<td>Dib, L., Petrelli, D., and Whittaker, S. Sonic souvenirs: exploring the paradoxes of recorded sound for family remembering. (2010).</td>
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**Related:**

**Narrative (video clip):** [http://vimeo.com/75959462](http://vimeo.com/75959462)

**Project website:** [www.materialisingmemories.com](http://www.materialisingmemories.com)
Description

Code | DPM97
---|---
Academic year | 2014-2015
Quartile | Q3/Q4
Title | Social Lighting
Responsible Lecturer(s) | Karin Niemantsverdriet and Harm van Essen
Co-lecturers | Jean-Bernard Martens, Ewelina Schraven, Rob Zimmerman.
Type of education | Project
Learning objectives | Main competency development target
| UFP; SCA; IT; DRP
| Team/individual
| Targeted blocks: B1; B3.2; M1.1; M1.2

Contents

**Introduction**
Light has a big influence on our appraisal of the environment and on how we perform in it. Correct lighting can support our activities: it has an effect on our alertness, can boost productivity, and can even influence our social behavior [2]. Think for example how you would prefer a bright spotlight to dimmed candles while studying, where as during a dinner with your loved one that same spotlight would probably change the outcome of the date for the worst. So depending on objectives and activities, we could benefit from personalized lighting settings.

Luckily recent advancements in lighting technology (e.g., [5]) have increased possibilities for dynamic, adaptive, lighting tremendously. Also more understanding is gained how new lighting interfaces can unlock opportunities to the user [4]. However, people are social beings. In our daily lives we share our spaces with many other people, which means sharing environmental conditions, such as lighting, too. In for example a family living room, an open office at work, your favorite restaurant, or semi-public spaces like the library: people have different objectives and could benefit from different settings, but need to share the same lighting conditions.

We currently lack understanding of multi-user interactions and their social implications. When do lighting conflicts occur? How can a system recognize these conflicts, and possibly intervene and mediate? And what are implications for the social setting, on the appreciation of the environment and on support of activities? In this project you will design and evaluate a lighting interface that supports interaction with multiple users, while finding answers to these type of questions.

**Approach**
Since the effects of light are very difficult to predict you can only experience them through quick iterations or ‘interactive sketches’ with light [3]. Therefore we encourage you to actively work within your context, so you can analyze social structures and protocols, do quick iterations with low-fidelity systems and interfaces, and experience implications from first hand.

For B1 students the context for this project is the breakout area: a multi-functional meeting room in our department. The breakout area is equipped with an advanced adaptive lighting system, for which you will design a new interface. Students from other years can choose and study a context of their interest.

This project is both suitable as a design project, where more attention will lay on the interface and the added value of the lighting, and as research project, where
Design challenges
Depending on your context and on a research or design focus, many different challenges are involved. We elaborate on some of the main issues below:
- **Control**. Who will decide on the light settings? Do you divide control democratically, is there one leader who gets the last say, or should the system take over control?
- **Mediating between different users**. When everyone has different needs and wishes, how can they co-exist within one space? Do you divide territories, average settings, or prioritize? What does this change in the light preference mean for the users and how is the decision communicated to all members?
- **Different needs & wishes**. How will you check if your system gives satisfying lighting results? When different people have different needs and wishes, their appraisal of the lighting conditions will vary. Will the system take all the feedback into account? How do you recognize who gave it?

Contributions to the mission of the department
This project is part of ongoing research in the ‘Light for Health and Wellbeing’ track. This research track is part of the Lighting Flagship: a long-term relationship between Philips and the Intelligent Lighting Institute of the Eindhoven University of Technology. Goal of this research is to explore applications that optimally make use of the beneficial effects of light on health and well-being. The department of Industrial Design, and in particular the PhD research of Karin Niemantsverdriet, contributes to this goal by investigating how intelligent lighting systems can offer personal preferences while supporting social multi-user settings. With this project specifically, we aim to gain understanding on the social implications of multi-user lighting systems and to develop an array of multi-user interaction styles.

Partners and Contributions
Partners in this project are the Intelligent Lighting Institute and Philips. Both contribute to this project by means of valuable lighting expertise and personal feedback. Furthermore several prototyping tools and technologies are available, such as several Philips Hue sets including light bulbs, led strips, and Living Colors lamps [5]. Software for Processing has been developed that allows easily control over the Hue lamps from a laptop, as well as a custom wireless sensor platform: Lithne [1]. These technologies allow you to implement your ideas right away, and support rapid prototyping for an interactive design process.

Deliverables
Deliverables for this project are:
- Multiple physical explorations of multi-user interaction styles
- At least one prototype interface that has been evaluated, preferably within a realistic context with real users
- A report documenting the results and process

References
1. Lithne: an Arduino-based platform for wireless lighting applications: http://lithne.id.tue.nl
5. Philips Hue API: http://developers.meethue.com