Dutch Empathic
Environment Livinglabs

2022

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Dutch Empathic Environment Livinglabs

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‘ Dutch Empathic Environment Livinglabs (DEEL) aim to create homes and neighbourhoods that adapt to, and anticipate what people can, want, and need, in collaboration with and for them. ’

- Masi Mohammadi

From experiment to evidence

prof.dr.ir. Masi Mohammadi, scientific director DEEL Academy

In the current societal debate about the housing crisis, the focus is often on the lack of housing. However, in my opinion, a crucial aspect is overlooked: the lack of “suitable” housing. This is concerning given the growing number of vulnerable seniors who wish to continue living independently in their own homes, both by choice and as a result of government policies. We face a societal challenge to provide this group with suitable housing that promotes self-reliance and community support. This challenge goes far beyond simply providing a roof over their heads. For seniors, housing is not only about having a place to live, but also about having access to care and services that make their lives easier, and being part of a liveable, caring, and safe environment. Vulnerable people who have high needs but low energy should not be expected to navigate various service providers themselves. Instead, they need a comprehensive package that builds on their strengths while also considering their (latent) needs. When designing new homes and neighbourhoods, it is important to consider both technical and social requirements to ensure that people can live well, even if they are vulnerable or may need support later on.

Therefore, Dutch Empathic Environment Livinglabs (DEEL) aims to create housing and neighbourhoods that adapt to and anticipate the abilities, desires, and needs of people who live there, in collaboration with and for them. We call these homes and neighbourhoods ‘empathic living environments’. We collaborate closely with knowledge institutions, housing corporations, resident initiatives, and healthcare organizations to research living environments that promote health.

I am proud of our multidisciplinary approach in shaping this comprehensive package. Sometimes, this approach requires extra time as we speak different languages and have different priorities. Therefore, we need a shared starting point, or vision, and at times we need to take a step

back. Nevertheless, we always find each other in the common ideals that we share: placing the end user at the centre, maintaining a human scale, recognizing and utilizing social-technical possibilities, and continuously learning from each other. We work with housing corporations and healthcare, and welfare organizations that have the courage to deviate from the familiar path and seek new ways, despite the enormous pressure they face in their daily practice and the challenges they must overcome.

To me, DEEL is already a successful learning community. We started because we wanted to further explore technological and social applications that we researched and developed in a real-life living environment. Together with people who have expertise in practice, and especially together with end-users. We have succeeded in this endeavour. Furthermore, we frequently share our knowledge, and increasingly hear that our approach and findings may serve as an inspiration for others.

This booklet provides an overview of projects we have completed as well as those we are currently working on. The content of these livinglabs is focused on four key areas: 1) what the resident wants or is still capable of, 2) their living environment (home and neighbourhood), 3) how technology can improve their quality of life, and 4) what is good for the planet that we all share. Additionally, we offer a behind-the-scenes look into the work of our researchers, resident consultants, and community members who are actively involved in our research.

The foundation of DEEL is now in place, providing us with confidence as we strive to achieve even greater ambitions in the future. We aim to investigate the long-term effects of the smart living environments we develop, to share our knowledge and learn from others, both internationally and in the Netherlands. Our objective is to encourage

safety, health, self-reliance, and communal reliance in the living environment, while making sure that human and technological capabilities are taken into account as a natural part of discussions about future housing typologies.

Masi Mohammadi,
Scientific Director of DEEL Academy

Masi Mohammadi, Scientific Director of DEEL Academy ▷


woning stichting domus
hester
daar ben je thuis
WOONinc.
oktober
RSZK Floriaan
STADSDORP
VONDEL HELMERS


coffr
impact in real estate
HAN UNIVERSITY OF APPLIED SCIENCES
KIEN
WOONZORG NEDERLAND
Santé Partners
Jozefoord
JAMZONE
ZORGGROEP
Oude en Nieuwe Land


deel
Dutch Empathic
Environment Livinglabs

Collaboration within DEEL Academy

The DEEL Academy aims to create housing and neighbourhoods that adapt to and anticipate the abilities, desires and needs of people who live there, in collaboration with and for them. We call these homes and neighbourhoods 'empathic living environments', which means that desires, needs, and lifestyle of the end-user are at the core of our design philosophy. We strive to enhance and simplify the daily lives of people in their living environment in an empathic and comprehensive way, using smart technology; technology that can sense and respond appropriately to their needs.

Multidisciplinary and innovative

To achieve its goals, DEEL focuses on conducting scientific and practice-based research that contributes to increasing independence, and self and communal reliance, so that people can remain living at home for longer while maintaining their quality of life. We conduct multidisciplinary research that contributes to the human-centred and future-oriented utilization of social, spatial, and technological possibilities. Furthermore, we explore new forms of housing, design principles, techniques, and methods for 'smart' living on both theoretical and empirical bases. By integrating different knowledge domains, we aim to develop a framework of new, innovative spatial concepts and applications that promote sustainable, healthy, and stimulating living environments.

Livinglabs

DEEL is organized around three key thematic areas: Social Living, Smart Living, and Living is More than a House. Our research is conducted in Empathic Livinglabs across the Netherlands, where professionals from various fields collaborate to research design principles and methods in close partnership with care organizations, housing corporations, and most importantly, with the residents themselves. These labs are characterized by active, innovative collaboration across the entire housing chain, from independent living with or without ambulatory care to residential living. Our

projects often include PDEng-/PhD-trajectories, and we actively engage with students who are the future professionals in this field.

Masi Mohammadi, a lector at HAN University of Applied Sciences (HAN) and professor at Eindhoven University of Technology (TU/e), is the initiator of DEEL. In 2014, the first livinglab was created, which served as a precursor to the current Empathic Livinglabs, Motel Spatie. Besides this the the construction of the Empathic Home as a testing location and showcase took place. In 2017, with the start of the 'Smart Living Eases Care' project within RSZK Healthcare Professionals (now the Zorg in October Livinglab), a network of Empathic Livinglabs was created. Since then, mutual cross-pollination has occurred between knowledge institutions (research/education), livinglabs (resident initiatives, healthcare organizations, and housing corporations), government, and the business community. DEEL Academy now has livinglabs spread throughout the Netherlands.

Future

In 2022, DEEL entered a new phase. Over the coming years, this collaborative partnership will be further solidified and made more sustainable by creating a learning community where professionals, residents, students, and researchers can collaborate.

In the coming years, we will collaborate even more closely in the development of smart living-care environments. This will be achieved through cross-pollination, promoting our effectiveness, and sharing knowledge and experiences. Furthermore, the DEEL network will benefit from a joint activities calendar with workshops, webinars, and an annual conference, as well as the practical application of scientific knowledge and rapid exchange of knowledge and experience.
Moreover, we inspire and learn from each other's processes at various levels. As thé network for well-founded empathic solutions, DEEL aims to effectively tackle the challenges of living and care.

In the coming years, we will collaborate even more closely in the development of smart living-care-environments. This will be achieved through cross-pollination, promoting our effectiveness, and sharing knowledge and experiences.

Bringing colour to senior living together

Cees van Boven, Chairman of the Board of Directors of housing corporation Woonzorg Nederland

As the largest senior housing provider in the Netherlands, we consider it both our mission and our duty to make a meaningful contribution to today's and tomorrow's society.

The phenomenon of 'double ageing' is keeping the demand for senior housing high. We have observed a wide variety of preferences among seniors when it comes to housing. Furthermore, the policy of promoting independent living for longer periods of time poses challenges for the types of housing needed. This is why we are investing in 'living independently together': a comfortable and safe home that provides space for social interaction and access to care if needed. We are working in collaboration with tenants and local partners to achieve this. The new government program 'Living, Support, and Care for the Elderly' confirms the direction we have set for ourselves.

To achieve this, collaboration with science is a must. This involves understanding the needs of seniors and determining what works in terms of communal reliance and prevention. Together, we bring colour to housing for seniors. We are proud partners of DEEL Academy, which ensures close collaboration with other innovative partners and a direct link between science and practice.

Meeting each other is important for self-reliance and communal reliance, and it is therefore a high-priority theme for us. Within livinglabs, DEEL is conducting research in two residential complexes of Woonzorg Nederland to explore the best ways to facilitate communal living and community building. An aspect of this research is how buildings can stimulate social interaction and how environments can foster or enhance self-reliance and communal reliance. Tenants are actively involved in the process and play a crucial role in shaping their own wishes and preferences.

Our goal is to connect the results of our various livinglabs and translate them into practical

applications for our residential complexes and their surrounding areas in the long term. We prioritize meeting the needs of our target group, as well as considering the environment and partners when developing our projects. Architecture is secondary to our approach, as we believe that creating together is the foundation of living together independently.

△ *Cees van Boven, Chairman of the Board of Directors of housing corporation Woonzorg Nederland, the Netherlands.*

‘ Living together independently: a comfortable and safe home that provides space for social interactions and access to care if needed. ’

- Cees van Boven
Housing Corporation Woonzorg Nederland

The DEEL Academy as a community: learning community

Moniek van Loon MSc & ing. Toine van Lieshout

DEEL Academy consists of an 'inner circle' of DEEL partners who work together to achieve an overarching goal: creating an empathic living environment. They collaborate closely with businesses, government entities, and other network partners to accomplish this goal.

DEEL Partners

DEEL partners take an active rol in acquiring, sharing, and utilizing knowledge through their projects in livinglabs. As a result, they have a significant influence on research themes, programs, valorization, and events organized by DEEL. The connection with education is also embedded in the projects, through PhD, PDEng, and student projects,

As a learning community, DEEL has the explicit goal of promoting cross-pollination between livinglab projects and partners. Additionally, the learning community aims to reach employees within organizations.

In order to establish close working relationships and collaborate effectively, the Transition Team for 'Het Nieuwe Wonen' was established in 2022, with representation from each partner. The team meets to discuss the process and content of our goals, as well as how we can achieve them together.

At DEEL, we exchange interim research results whenever possible and utilize each other's experiences and knowledge in ongoing projects (such as in the street fair Smart Neighbourhood Malvalaan). Our aim is to translate these results into practical tools. We also promote cross-pollination in other areas, such as collaborating on new projects, and sharing knowledge about content and processes.

Friends of DEEL

Friends of DEEL (e.g. partners involved in various livinglab projects) as well as the broader DEEL network, are regularly involved in our activities, including theme workshops, lectures, and

◁ *DEEL-partners are building their dream for the empathic living environment, March 2018 (Photography: Charlotte van Buuren)*

webinars. One example is the project 'The Art of Connection': through webinars on various topics, members of the DEEL network collaborate to discuss the project's substantive follow-up. These webinars can feature expert lectures, a collection of state-of-the-art knowledge, sometimes combined with contributions from student projects, or we have more interactive sessions where we work concretely together. This offers direct input for the project itself, as well as providing attendees with new insights and energy. It also gives the project an extra boost, as we can directly apply input from the network. Other sessions are more inwardly focused, bringing together stakeholders and users as a community for the livinglab project, along with the project team and students.

DEEL Academy and the outside world

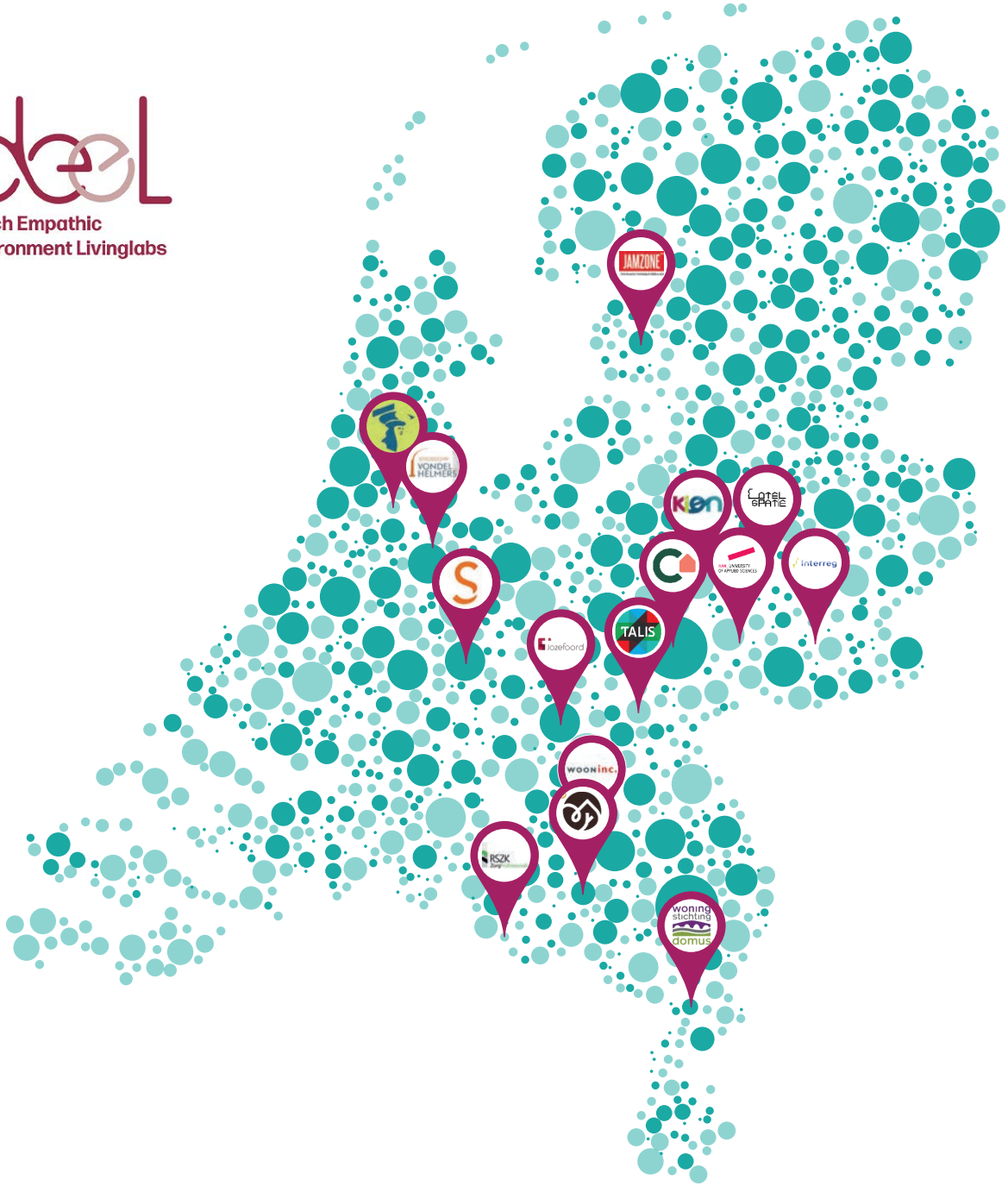
Lastly, in order to provide value to society and exchange the latest insights, DEEL also directs its efforts towards the outside world. Apart from publications, communication activities, and the 'Het Nieuwe Wonen' Conference, DEEL also provides tailored inspiration sessions, national and international keynote speeches, and guided tours in the Empathic Home (upon request).

In 2021, much of our work took place digitally, but this year we are looking forward to inspiring each other through regional safaris and physical networking events. Together, we aim to work on developing tools for practical use across multiple projects, and making scientific knowledge applicable to real-world situations.

Learning Community

Over the past few years, several activities have taken place within the DEEL Learning Community. Throughout this publication, you will find examples of these activities, which can be identified by the logo in the upper right corner of each page.

Dutch Empathic
Environment Livinglabs



Partners of livinglab projects

At DEEL Academy, we collaborate with partners. Together, we conduct research within livinglab projects from various perspectives. Our partners include housing corporations, healthcare organizations, social organizations, residents' initiatives, businesses, and knowledge institutions. All partners will be featured on the following pages.

Livinglab partners: Housing Corporations

Woonzorg Nederland

Director: Cees van Boven

Woonzorg Nederland focuses on housing for seniors. Their housing stock consists of approximately 30,000 independent living units and 12,600 residential units in buildings that are rented out by nationwide care organizations.

Wooninc.

Director: Angela Pijnenburg

Wooninc. is a housing corporation that rents out over 12,000 homes in the Eindhoven metropolitan area and has more than 120 employees. Their focus is on seniors, and the corporation aims to help seniors live independently for as long as possible in a way that suits them. They offer various living concepts that combine housing and care, and collaborate extensively with care organizations.

Housing Association Domus (Now: Nester)

Director: Harrie Oosterlee

Housing corporation Nester was formed in 2020 from a merger between housing association Domus and ‘WoonGoed2-duizend’(LiveWell2thousand). The corporation offers affordable housing to low-income people in the Middle and North Limburg regions. Nester has around 7,000 rental units, of which about 25% are related to care. The goal is to own even more care-related housing in the future.

Talis

Director: Ronald Leushuis

Talis is a housing corporation that manages around 15,500 homes in the Nijmegen-Wijchen region (The Netherlands). Talis takes on the responsibility of being a housing provider in the network of housing, welfare, and care, with the goal of creating sustainable and vibrant living communities. They offer support through providing suitable and affordable housing to customers who are unable to independently meet their housing needs.

Livinglab partners: Healthcare Organizations

Zorggroep Oude and Nieuwe Land

Director: Albert Hilvers

Zorggroep ‘Oude en Nieuwe Land’ (ZONL) is a care organization located in the municipalities Steenwijkerland, Noordoostpolder, and Urk, The Netherlands. Through small-scale teams, their employees add value to the lives of unique individuals for a short or long period of time. Their compass for providing care is the vision of ‘Involved Care’. Together with the care recipient and their environment, they make it possible to provide the care that is truly needed, at that moment and in that place-care that is of value. (source: www.zorggroep-onl.nl)

Zorg in Oktober (formerly RSZK Healthcare Professionals)

Directors: Marion van Zoom & Jessica Vogel (formerly: Paula Nelissen)

Oktober is an elderly care organization in the Kempen, Veldhoven, and Waalre regions in the Netherlands, providing housing for 600 residents. Over 1200 seniors receive care and support at home, thanks to the daily efforts of 1900 employees and 900 volunteers. As a partner in the ‘Smart Neighbourhood’ initiative, Oktober contributes to community participation and the development of the nursing home ‘t Laar.

St. Jozefoord

Director: Adré Groot Bluemink

Sint Jozefoord is a care estate that was founded in 1950. Due to the decrease in the number of religious residents over time, Sint Jozefoord has been open to everyone since 2008. However, the religious character is still tangible to this day and is reflected in the organization's motto, 'everything from connectedness'.

Santé Partners

Manager: Ilja Rodermans

Santé Partners is a healthcare organization operating in the regions of Arnhem, Utrecht, Bommelerwaard, Gelderse Vallei en Rivierenland, the Netherlands. It provides support and care throughout all stages of life and aims to enable people to live independently at home for as long as possible. The livinglab is located in the Elisabeth-Hof nursing home in Culemborg, the Netherlands, and targets seniors with dementia who reside in the nursing home. Around 40 participants, including seniors, their caregivers, and nursing home staff, take part in this lab.

DrieGasthuizenGroep

Director: Angela Janssen

The DrieGasthuizenGroep has been dedicated to providing care for seniors in and around Arnhem since 1246. With 12 locations available for seniors to receive care, the organization offers assistance for seniors both in their homes through home care and household help, as well as during their final phase of life in a care facility.

Livinglab partners: Social Organizations and Resident Initiatives

Urban Village VondelHelmers

Core team: Marja Peltenburg, Marlene Hoynck

The Urban Village VondelHelmers in Amsterdam is a resident initiative with over 290 members from the neighbourhood. The goal of the Urban Village is to promote community spirit among the local residents. To achieve this, various activities are organized in the neighbourhood.

Motel Spatie

Established in 2010 as an art space in the Presikhaaf district of Arnhem, Motel Spatie aims to demonstrate how contemporary art intersects with culture, economy, and politics, making it a significant player in the discourse about our shared future (source: www.motelspatie.nl).

Cohousing Arnhem

Initiator: Peter Camp

Association Cohousing Arnhem is developing a residential building for 30 households located in the centre of Arnhem. The project is currently in the preparation phase (2020-2022), with construction expected to begin in 2023 and occupancy scheduled for 2024. The objectives of Cohousing Arnhem are to promote inclusive living across multiple generations, community building, interaction with the neighbourhood, and a unique building with shared spaces. For more information, please visit their website at cohousing-arnhem.nl.

Livinglab partners: Corporate Sector

Livinglab partners: Knowledge Institutions

TU/e

HAN UNIVERSITY OF APPLIED SCIENCES

Leyden Academy ON VITALITY AND AGEING

ArtEZ

UNIVERSITY OF AMSTERDAM

Hogeschool van Amsterdam

Fontys

hogeschool Windesheim Dichter bij jou

PLATFORM31 kennis van stad en regio


TU/e

Learning Community

At our annual conference ‘Het Nieuwe Wonen’, the directors of livinglabs engage in living room conversations with each other.

◁ *Directors in conversation during the ‘Het Nieuwe Wonen’ conference in 2019 (photography: Charlotte van Buuren).*

Theme:
Social Living

Theme:
Smart Living

Theme:
Living is More than a House

The Livinglabs in three themes

At all our livinglabs, we're working towards creating an empathic living environment that caters to the needs and preferences of the user. We focus on three themes: Social Living, Smart Living, and Living is More than a House. The first theme explores the social aspects of housing, while the second theme delves into the role of technology in housing. In the last theme, we go beyond the dwelling and examine the neighbourhood level, as well as the impact of the living environment on user behaviour.

In the following pages, the livinglabs of each theme will be covered.

Theme: Social Living

Advancements in healthcare are contributing to an increase in people's life expectancy. At the same time, a declining proportion of the population is participating in the labor market. This double ageing leads to new societal challenges in our participatory society. A consequence is that there is a growing number of (vulnerable) people living longer in their own homes, requiring more informal and formal care to be provided at home. This places a significant demand on individuals' self-reliance and community support.

The proportion of vulnerable groups in the social housing sector has significantly increased in recent years. These groups, including seniors and those with care or support needs, face an increased risk of loneliness, social isolation, and limited self-reliance. In neighbourhoods where vulnerable groups live together, there is an increase in disturbances, demand for care, and the communal reliance and liveability of the area are incresingly under pressure.

Housing and care professionals face an enormous challenge, which will only become greater in the coming years due to societal developments such as ageing and the separation of housing and care. Especially for those in vulnerable situations, the design of the indoor and outdoor space is essential in creating a sense of community and social cohesion. The proximity to contacts and accessible resources is crucial for enjoyable long-term living at home.

Within the research theme of Social Living, we investigate the importance of social interaction and supporting each other, and the role that the built environment can play in this. We also consider the possible role of technology and AI. Topics covered include questions related to meeting places, social amenities, how to accommodate more diverse residents compositions, and the development of (shared)housing forms and associated design guidelines.

◁ *Visualisation of the theme Social Living, based on social strenghts (Image: Masi Mohammadi)*

Social living

Livinglab project 'The added value of communal living in an ageing society' (Housing Corporation Woonzorg Nederland)

Research team: Nienke Moor, Kim Hamers, Liudmila Neykova, Masi Mohammadi (TU/e)

Livinglab: Anne van Grinsven, Lucien Palmboom, Arianne Hendriks (WoonZorg Nederland)

Livinglab project 'Operation meeting spaces' (Housing Corporation Talis)

Research team: Masi Mohammadi, Nienke Moor, Ruth Bles, Liesbet Rabbinge (TU/e)

Livinglab: Mariëlle Heuvelmans, Jacques Steegemans (Talis)

Livinglab project 'Smart living eases care' (RSZK Care Professionals)

Research team: Masi Mohammadi, Leonie van Buuren (TU/e)

Livinglab: Paula Nelissen, Rob Slegers (RSZK Zorgprofessionals)

Livinglab project 'The Empathic Home in social housing (Housing Association Domus (Formerly Nester))

Research team: Masi Mohammadi, Marije Sanders-Kortekaas (TU/e)

Livinglab: Harrie Oosterlee (Domus)

Communal living leads to lower societal costs.

Livinglab Woonzorg Nederland

WOON ZORG NEDERLAND

The added value of communal living in an ageing society

WOON ZORG NEDERLAND

Towards suitable housing forms in the social rental sector that promote the (social) well-being of older residents

The livinglab

With the increasing number of seniors living in neighbourhoods owned by housing corporations, community support and social cohesion are under pressure. As more and more people require support and care, and fewer residents are able to assist their fellow residents, this leads to increased social vulnerability and loneliness.

A living environment that encourages interactions between residents and promotes social cohesion and community support can help people to live independently in a pleasant way for a longer period of time. In response to this, WoonZorg Nederland, a housing corporation in the Netherlands, is developing new housing concepts that stimulate encounters and community support among residents. The question is whether these housing concepts succeed in this and how these housing concepts can best be designed spatially and socially.

△ *In conversation with the residents, using their pictures as a starting point: discussing their experiences and needs regarding their living environment and the encounters that take place in it.*

◁ *The meeting space of the Brinkpark (Blokker, The Netherlands)*

WOON ZORG NEDERLAND

The objective

The objective is to understand how these collective housing forms can be designed spatially and socially in order to promote social cohesion and community support among residents. The result of the research will be design guidelines and strategies for communal living for seniors in the social rental sector. We will focus particularly on the spatial and technological design of the housing form, but always in relation to the composition of the resident group and the way in which residents organize life in the living community.

The method

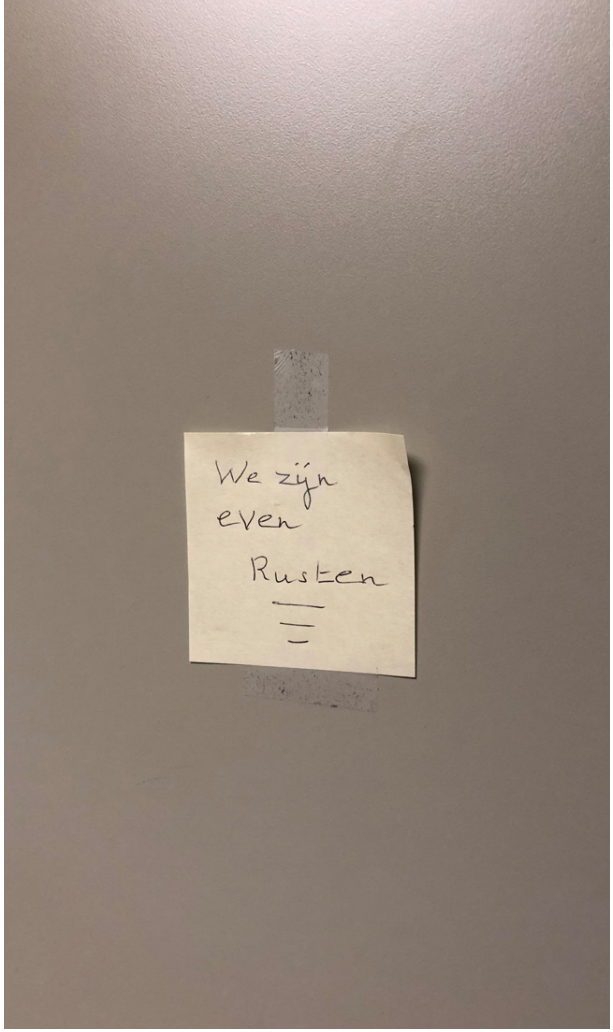
In the research, we will collaborate with staff from Woonzorg Nederland who are involved in developing housing formulas for suitable communal living arrangements for seniors in the social rental sector. We will employ a variety of research methods, including qualitative methods such as participant observation, semi-structured in-depth interviews and photovoice to evaluate the benefits, challenges and risks associated with communal living. With the photovoice method, residents' experiences, memories, and emotions are directly linked to the spatial and social design of the living environment.

In addition, we will also conduct an evaluative research by analysing real estate data from the housing corporation and survey data collected from staff and residents. This will enable us to identify variations of communcal living within the housing stock of Woonzorg Nederland, based on relevant spatial and organizational variables. For instance, we will use an exploratory cluster analysis to examine the spatial design of living and co-living arrangements, and how residents are involved in the organization of the housing form and composition of the resident group. We will also investigate the impact of these different variants on the interaction between residents, community building and community support.

The outcome so far

The research has shown that the living space should not only provide opportunities for planned activities, but also foster openings for unplanned interactions between residents. These spontaneous encounters are crucial for building familiarity and relationships with the entire community of residents.

Additionally, ownership and self-organization among residents are vital for creating a sense of engagement and participation among residents. However, this engagement can also lead to increased conflicts and tension among residents as individuals have different opinions and expectations when working and organizing together. It is evident that the creation of a sense of community does not happen organically, but is the outcome of a combination of social, spatial, and organizational factors.



△ *A post-it on the (internal) front door of one of the residents of the building. It is an example of informal communication among residents.*

What is the perspective of the project partner regarding the Livinglab?

Arianne Hendriks, Strategy and Innovation advisor

What has the project yielded thus far?

Through this project, we now know which buildings may stimulate encounters and which likely do not. The real estate of Woonzorg Nederland has been divided into five clusters of housing forms that differ in the degree to which and in the ways they stimulate encounters. In addition, through literature study and study of global best practices, we now have a better understanding of how buildings can be designed and spaces can be differently arranged and utilized to stimulate social contact between residents. However, most insights have yet to come from the survey research among residents about their experiences of the living and meeting spaces and their needs in these spaces. This research has recently started.

What is the added value of the collaboration?

Woonzorg Nederland aims to provide suitable homes and living environments that foster interactions among residents. In doing so, Woonzorg Nederland wants to innovate and be able to respond optimally to changing needs and requirements of (future) seniors in the social rental sector. Collaboration with academia plays a crucial role in achieving this goal, as this research provides valuable insights on the best practices for designing and laying out buildings, based on scientific research, knowledge, experimentation and real-world implementation. This research enables Woonzorg Nederland to make informed decisions when it comes to creating new housing solutions for seniors in the social rental sector.

Partners:
Woonzorg Nederland
HAN: Architecture in Health

Duration:
June 2020 - May 2024

Resident consultant Arjan Appelman of the Housing Corporation Woonzorg Nederland works at one of the research locations of the Woonzorg Livinglab. He is the pivot between the researchers and the residents for research into the needs and wishes of the residents. He puts the researchers in touch with the residents and helps the residents prepare for the research. He is well aware of the importance of having a suitable meeting space, such as the one in the Brinkpark housing complex in Blokker, The Netherlands. We inquire about his experience with the functionality of the meeting space. How is the space used, what do residents appreciate and what is needed in terms of organization?

The meeting space in practice

In conversation with Arjan Appelman, resident consultant of Woonzorg Nederland

Interview

Meeting space

Long tables, a large modern kitchen and a seating area with sofas: the central meeting space of Brinkpark, located on the ground floor of the housing complex, is spacious and comfortably furnished. Arjan Appelman leads his visitors around with enthusiasm. After the large-scale renovation a few years ago, he came to work here as a resident consultant. The former care home became an apartment complex for 55-year-olds and above. On the ground floor, a large meeting space was created that is now used by both residents and neighbours.

In which ways are the meeting spaces used?

“In many ways. Every day people can come and have coffee between ten and eleven a.m. And people who don’t cook themselves but use a kind of meal service eat here at noon. Furthermore, there are billiard evenings and fitness mornings in adjacent rooms. Outside we have a ‘jeu des boules’ court. But we also have singing afternoons or drawing workshops.” Arjan points to the large monitor at the entrance of the space. “Look, the program is here for everyone to see. And we also announce all activities in the village newspaper. Like last time when the Hazes Choir came to perform. Great, all people singing songs by André Hazes in suits and with hats on.”

Who organize the activities?

“We work with a large group of volunteers. There are a number of community connectors and they in turn have a number of volunteers working for them. And my colleague and I are here to organize the peripheral matters. What is nice is that all sorts of interactions occur here. Some residents are volunteers themselves, but we also see that people come as volunteers in this complex and later move in themselves. In this way all sorts of connections are formed. What is organized depends on the wishes of the residents and the interests of the volunteers. For example, one of our community connectors is a retired chef. He cooks three-course

◁ *Resident Consultant Arjan Appelman of Woonzorg Nederland.*

dinners here in the kitchen, and they are very good. And there is a former social worker who lives here who wants to help people fill out forms for energy bill assistance."

It is unique that people from outside the complex can also use the space. Why was this choice made?

"It's practical: there's a lack of such a space in the neighbourhood. And it does strengthen the connection between the people who live here and the living environment. Actually, that connection is already present in Blokker since it is a tight community, but the fact that the surrounding people can easily walk in and out helps to create a sense of community."

Why are meeting spaces important?

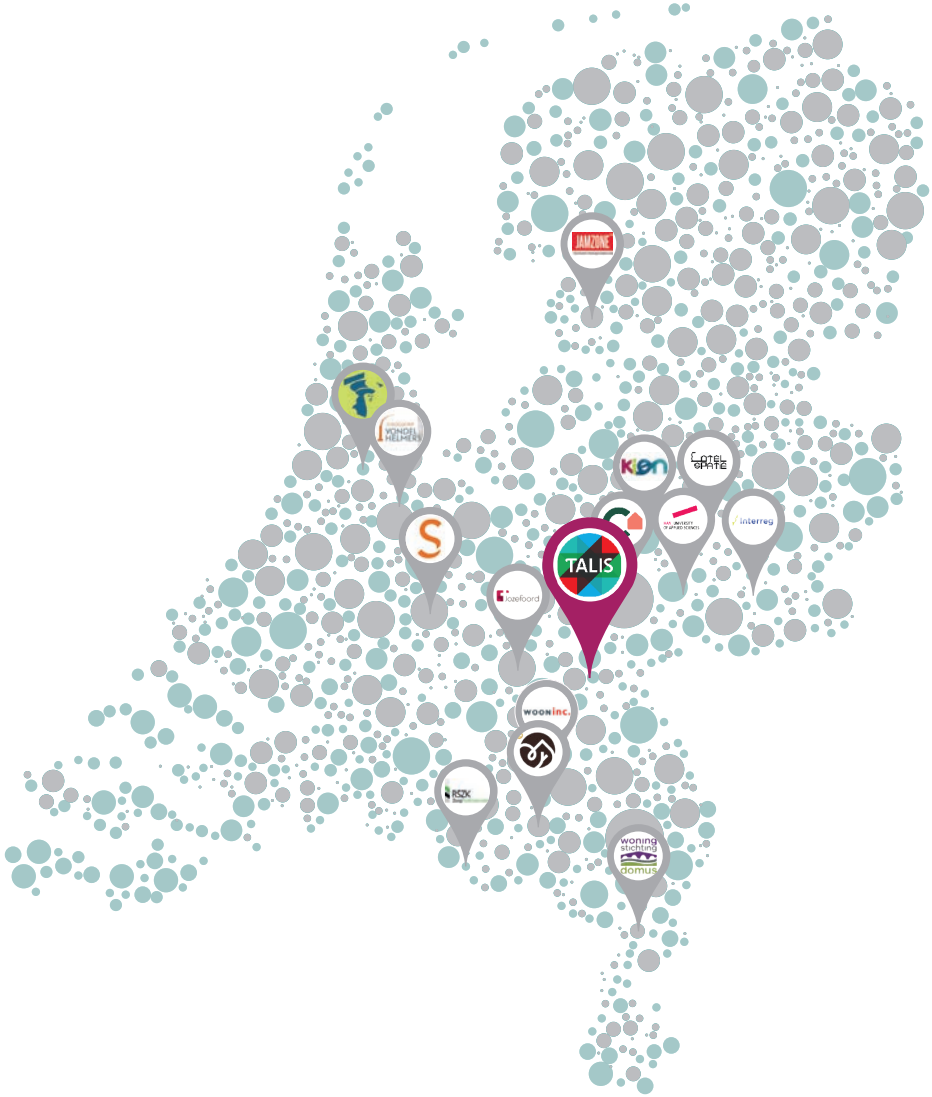
"You want to get people out of their homes, combat loneliness and create a sense of community. What we try is to replicate the sense of safety, security, and conviviality that people used to have in their homes in the new situation. And a physical space where people can meet is very important for this. People see that something is happening and also what is happening. I always think: how would I want it to be if I lived here? That's what I strive for."

‘ You’re trying to create the sense of warmth and community here that people used to have in their homes. ’

- Arjan Appelman
Woonzorg Nederland

Whether or not people meet each other has everything to do with smart spatial design.

Livinglab Talis



Operation Meeting Spaces

A smart social-spatial design of a meeting space that encourages interactions between residents.

The Livinglab

Talis is collaborating with other involved partners to find housing concepts that align with the newly arising needs of (vulnerable) renters. This will enable them to offer more suitable housing options for this expanding demographic, while also enhancing community support and vitality within the housing complexes. One possibility that Talis wants to explore is encouraging interactions between housing complex and neighbourhood residents. This may help prevent social isolation among residents and encourage residents to report problems with renters earlier. In practice, the success of meeting spaces varies. Some spaces are heavily used while others not at all.

Therefore, we are investigating how to use spatial, technological, and social means to promote the use of meeting spaces and the interactions between residents that take place there.

△ *Researchers Bernell Herder and Liesbet Rabbinge are working with a resident of the Toermalijn in a co-creation session, where the layout of the meeting space is being mapped out on the floor using tape.*

◁ *Researcher Bernell Herder is working with residents of the Toermalijn in a co-creation session; residents can express their ideas on canvas.*

The objective

The objective is to maximalize the utilization of current meeting spaces to encourage interaction among residents, and to establish design guidelines and concepts that Talis can use when (re) developing meeting spaces.

The method

We used literature research to identify the social-spatial factors that can affect a) the use of a meeting space and b) the interaction that takes place between residents in this space. By observing the different meeting spaces of Talis and mapping out the context in which these spaces are located, we were able to determine the extent to which these spaces are suitable and equipped to promote interactions. Through interviews with residents (users and non-users of meeting spaces), we also identified what motivates or hinders people from using the meeting space and starting a conversation with fellow residents.

In this way, Talis gains more insight into (the potential of) its meeting spaces for facilitating interactions and the areas that still need to be improved. Based on these points of attention, architects at HAN develop design guidelines for the (re)design of meeting spaces. In co-creation sessions that we organize with residents, these guidelines are converted into design concepts and products for more effective meeting spaces.

The outcome

Thus far, the results have indicated the expectations that are held within the housing corporation; expectations about meeting spaces, the opportunities to get residents even more involved by actively stimulating gatherings, and the problems that are noticed in everyday practice and that still require attention. It has also been established which spatial, social, and organizational factors may influence the success or failure of meeting spaces. These factors include routing, visibility of the space, suitability of the space for

multifunctional use, homeliness, composition and size of the resident group, and the way in which the space is managed. By assessing the meeting spaces of Talis based on these factors, we now know what the social-spatial potential is of the different communal spaces and where there is room for improvement. These insights have been translated into a first set of design guidelines for effective meeting spaces. In co-creation with residents, these design guidelines have been translated into design concepts for two specific meeting spaces of Talis. The co-creation sessions also led to two products that can help bring about meetings between residents in a meeting space: an interactive table that can assist residents in starting a conversation and a communicating wall that helps residents to express their common identity and promote a sense of ownership of the space.

What is the perspective of the project partner regarding the Livinglab?

Mariëlle Heuvelmans, manager Leefbaarheid (Liveability)

What has the project yielded thus far?

In the collaboration thus far, and in addition to (scientific) knowledge about meeting spaces, it has also become clear what the needs are among renters with regards to interactions and meeting spaces. In co-creation sessions with renters, redesigns of meeting spaces have been presented. Two products have been developed from this, one of which is the conversation-starter-table, which has been tested in the Toermalijn meeting space in June 2022.

What is the added value of the collaboration?

A clear added value is the long-term collaboration between the lectorate and Talis. Understanding the context in which Talis operates is very important and contributes to research on the use and design of meeting spaces. It has been very helpful for us to clarify the needs of renters. This also contributes to a (different) vision for designing and furnishing buildings. This is an excellent opportunity to bring science to practice.

Partners:
Woningcorporatie Talis
HAN Univerity of Applied Sciences:
Architecture in Health

Duration:
Juni 2020 - May 2024

This project is also funded by the SIA Agency for Coordination (KIEM Subsidy). For more information, please visit https://www.sia-projecten.nl/project/vernieuwd-ontmoeten

◁ *The current situation at the meeting space in the Blikvanger, a residential building of housing corporation Talis.*


WELKOM BIJ DE TOERMALIJN
FRISSER
CLEAR
KLEUREN
ROOM

Co-creation leads to surprising discoveries

Liesbet Rabbinge, designer at HAN

Column

While it is possible to come up with a design based on a good briefing, designing together with a group of users is much more powerful. This approach allows us to gain a deeper understanding of the target group and their needs. By testing the design in various phases and incorporating ideas from the users themselves, you may uncover surprising discoveries.

Room for improvement?

This was also the case with the meeting room at Talis housing corporation. Interviews with residents revealed that the room was not being utilized to its full potential. While people sat together at tables, they did not interact with one another. Residents found the room uninviting with its small, uniform tables and chairs. They expressed a desire for an oval table where they could gather and enjoy a cup of coffee. However, a cosy table design alone does not guarantee increased social interaction. To promote socializing, we came up with an idea for an interactive conversation-starter table. The table features a mini-exhibit, including six small screens embedded in the surface that display rotating images.

With the residents in mind, we considered which images would help start conversations. We looked for themes that were common to people who, at first glance, appeared to have nothing in common. This led us to select various images of Nijmegen, a city in the Netherlands where the community space was located. For instance, a photo of people ice skating in a local location prompted the residents to recall memories and share stories. One person had also skated there, while another shared a memory of a different location.

Rethinking the utilization of space

Furthermore, we found that there were different opinions about the use of the meeting space. Some residents naturally felt ownership of the gathering place, which made that others were less inclined to visit. We needed to find a solution to address this

◁ *Two residents of Toermalijn during a co-creation session.*

issue. We also discovered that residents desired the ability to divide the space further. The residents drew floor plans that included specific areas for the pool table, seating area, and so on. We engaged in further conversation with them about these ideas.

Taking all ideas into consideration, we created a communicating wall. It's a semi-transparent cabinet with moving parts in which residents can display something personal, like a painting made during a painting course or photos from their card club. This adds a homier feeling to the space and makes it inclusive for everyone.

Co-creation: what worked and what didn't?

The co-creation sessions provide us with design guidelines for meeting spaces and valuable insights into what works and what doesn't in the process. However, the research method of having seniors lay out the space by attaching tape to the floor proved to be impractical due to the obstacles posed by walkers and back problems. Initially, we were inclined to have a large group conversation, but we shifted to letting smaller groups talk to each other and then present their ideas to the larger group. This approach ensured that a wide range of opinions are represented, rather than just a few people dominating the conversation. And that is what we want.

While it is possible to come up with a design based on a good briefing, designing together with a group of users is much more powerful.

Results of a co-creation session with residents. .


EEN PLEK VOOR CONTACT
WARM
'T KOMPAS: EEN PLEK VOOR CONTACT
Stap 1. SFEER
Welke sfeer of sferen spreken jou aan en wat zouden de andere bewoners als prettig ervaren?
Stap 2. GESPREKSSTARTER
Hoe kom je in gesprek met (on)bekenden? Waar heb je het graag over. En waar juist niet?
Stap 3. PLAATS NEMEN
Welke manieren van zitten, staan en hangen zouden er in de ruimte mogelijk moeten zijn?
Stap 4. ZONERING
Stap 5. ACTIVITEIT

The design of buildings affects the stress levels in people with dementia.

Livinglab RSZK Healthcare Professionals

Smart living eases care

RSZK ZorgProfessionals

Design principles and preconditions for a smart intramural residential care environment

The Livinglab

Seniors with severe dementia can no longer continue to live at home and must move to an intramural residential care environment (nursing home). However, many intramural residential care environments no longer meet the needs of residents. The healthcare organization RSZK healthcare professionals in the Kempen wants to provide space for over 420 residents with dementia in the coming years. To meet the demand and wishes of residents, there are plans for renovations, expansions, and new construction.

The organization wants to know how to improve and make the real estate that is intended for seniors with dementia future-proof. The current real estate varies greatly: there is large-scale and small-scale living, and the spatial layout also differs. They ask to establish design principles and requirements for a smart intramural residential care environment for seniors with dementia.

△ *Researcher Leonie van Buuren presents the Livinglab 'Smart Living Eases Care' during the symposium 'Het Nieuwe Wonen' 2018 (Photography: Charlotte van Buuren).*

◁ *RSZK healthcare professionals own eight residential Care buildings in the Kempen, Veldhoven and Waalre (the Netherlands).*

RSZK
ZorgProfessionals

The objective

The project aimed to develop design principles and preconditions for a future-oriented and smart residential care environment for seniors with dementia through co-creation with residents, staff, and caregivers of RSZK healthcare professionals. The design principles and preconditions has its focus on the type of space.

The method

We use different research methods to develop design principles, preconditions and specific products. This includes literature studies and building analyses, as well as interviews with residents and caregivers and behavioural observations. For example, we conducted an experiment with door stickers: are people with dementia helped with their orientation by introducing variations in the appearance of the doors in a hallway? To test this, we covered all doors in one nursing home with an image of a door, making sure that all doors next to and across from each other have different colours. We measured the situation before and after the intervention in terms of spatial orientation and atmosphere.

The outcome

We have drawn up a model containing design principles and preconditions for a number of areas in the building: the entrance and reception, the corridor, the meeting place, individual space and the sanitary facilities. Some interventions have been tested within RSZK healthcare professionals. As a result of the door sticker experiment, we have developed guidelines for implementing a welcoming, friendly, and recognizable entrance door for each individual resident's space. This promotes social interactions and spatial orientation of residents with dementia. The method can be applied to new construction, expansion and renovation projects within the healthcare organization.

Partners:
RSZK Healthcare Professionals (now: Zorg in Oktober)
TU/e: Smart Architectural Technologies

Duration:
December 2016 - November 2018

In one of the residential care facilities of RSZK healthcare professionals, the doors of the residents' rooms are fitted with door stickers. The Livinglab investigated the effects of these door stickers on the behaviour of residents with dementia.


DEL
Dutch Empathic Environment Livinglabs
Prof.dr.ir.
Masi Moham
| Full Professo
Architectural Techn
@TU/e
| Leading Le
@Academy Built En
| Lector Architec
Health @HA
| Scientific Dir
@ Dutch Empa
Environment Liv

Learning Community

The dissemination of knowledge about and from our Livinglabs extends beyond the DEEL Academy. We also present our research findings at conferences, both national and international.

◁ *Masi Mohammadi, together with Anja van Lier, presents on the topic of livinglabs during the Dutch Design Week 2021.*

The spatial arrangement of the floor plan is an essential component of the empathic design.

Livinglab Domus

The Empathic Home in social housing

woningstichting 100 jaar domus

Towards an affordable empathic living concept for independently living seniors

Nester
daar ben je thuis

The Livinglab

Housing corporation Nester (formerly Domus) is seeking ways to best support seniors who live independently at home. After all, government policy is geared towards this, but it is also the wish of seniors themselves. Whether someone is able to continue living independently depends on personal characteristics, stimulating factors and the need for care. The environment in which someone lives can affect those stimulating factors and the need for care and thus also influences the period of time that someone can continue living independently. Nester wondered whether (parts of) the Empathic Home, the Livinglab that investigates how a home can serve as a caregiver with the help of technology, could be applied in its social housing.

△ *Researcher Marije Kortekaas talks with residents during during the 'Domus Day' in 2017.*

◁ *The current status of the building on Bredeweg.*

The objective

We investigate which design principles are necessary for future-oriented houses that stimulate independent living for seniors with a low socio-economic background. With this, we want to develop an empathic housing concept that is affordable for a vulnerable target group.

The method

We used literature research, interviews and best practice analysis to compile the design principles. The design principles were tested against a case study: an existing senior complex in Roermond. Initially, we investigated whether this complex could be renovated to meet the current needs of the target group. When it became clear that this was not feasible, the design principles were translated into the design of a new building complex.

The outcome

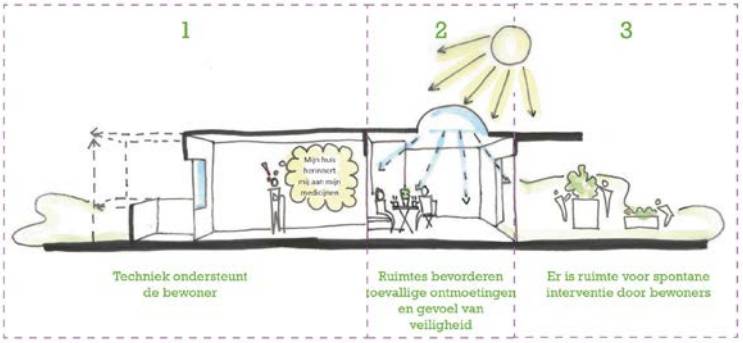
We have developed useful and sustainable design principles for future-oriented social housing that stimulate a socially active and independent lifestyle for seniors. An existing residential building with attached housing was used as a research area. Here we investigated how we could improve the environment. One of our recommendations was to allow residents to place personal items in the hallway to ease the transition from the public space to the private space. The final results have led to concrete changes that are partly implemented at this location.

To give developers and housing corporations better insight into the needs and wishes of the senior target group, a set of cards has been developed. These cards contain questions that make the developer aware of the living situation and how

Partners:
Woningstichting Domus (now: Nester)
TU/e: Smart Architectural Technologies

Duration:
February 2017 - January 2019

it suits the target group. The set of cards should be used as a starting point for thinking, not as a checklist or strict set of conditions. After all, the target group and technological developments are constantly changing.



△ *Concept of social housing from an empathic perspective in this livinglab.*

‘ The extra benefit of the livinglab, is the added value of scientifically supported creativity which leads to innovation in housing form. ’

- Harrie Oosterlee
Nester

Theme: Smart Living

Dementia is the leading public health issue, and it is expected that the number of people affected by this condition will only continue to rise. Seniors in the advanced stages of dementia are unable to live independently and must relocate to a residential care setting, such as a nursing home. When home care is no longer feasible, seniors should have access to adequate time, attention, and quality care within a residential care facility. Unfortunately, organizations often struggle to meet these expectations due to limited resources, negatively impacting the seniors' quality of life. However, technology that can adapt to the user's needs can greatly ease the lives of seniors, particularly those with dementia, and their healthcare providers. Furthermore, our understanding of the experiences and emotions of people with dementia is still limited. Invasive technology can provide insights into their condition and provide necessary support only when necessary.

The proportion of seniors (with dementia) living at home is also growing. In general, there is an increasing number of individuals with care needs who continue to live at home, while the group of young people who can potentially provide support is diminishing. This requires adjustments in both the social and physical environment. The use of technology can make a significant contribution if it meets the needs of these more vulnerable individuals and provides support and encouragement at the right times. Additionally, the COVID-19 pandemic has shown that social innovations are essential in combating loneliness and its potential impact on people's health and well-being.

Within the theme of Smart Living, we are exploring how (building-bound) technology can stimulate, support, and/or serve as medicine for people in an empathetic and warm manner.

◁ *Visualisation of the theme Smart Lving (image: Masi Mohammadi).*

Smart Living

Livinglab project 'Empathic Home' (Knowledge Institution HAN University of Applied Sciences)

Research team: Masi Mohammadi, Toine van Lieshout, Erik Groen, Moniek van Loon (HAN)

Livinglab project 'It takes a village to grow old' (Citizen Initiative Urban Village VondelHelmers)

Research team: Masi Mohammadi, Leonie van Buuren (TU/e), Barbara Groot, Tamar Shahinian (LA), Somaya Ben Allouch, Saskia Robben, Marwan El Morabet (HvA)
Livinglab: Marja Peltenburg, Marlene Hoynck (Urban Village VondelHelmers), Ivor Swaab (illi-tv), Annemiek Tuinhof de Moed (SM&D), Rozé van Leemput (WG Kunst), Deborah Lauria (CB)

Livinglab project 'Dementia and indoor climate' (Healthcare Organization Santé Partners)

Research team: Masi Mohammadi, Olivia Guerra Santin, Chuan Ma, Anne Grave (TU/e)
Livinglab: Ilja Rodermans (Santé Partners)

Livinglab project 'Space of Sustainable Happiness' (Healthcare Organization St. Jozefoord)

Research team: Masi Mohammadi, Joyce Fisscher (TU/e)

Livinglab: André Groot Bluemink (St. Jozefoord)

Livinglab project 'The Guiding Environment' (Social Organization KIEN & Healthcare Organization DrieGasthuizenGroep)

Research team: Masi Mohammadi, Coosje Hammink, Daniëlle Quinten, Erik Groen, Ivo Maathuis, Moniek van Loon, Toine van Lieshout (HAN), Anne Grave (TU/e), Somaya Ben Allouch, Saskia Robben, Sergio Bondietti, David Zeegfers, Marcel Aarts, Michel Oey, Mick Jongeling, NAzli Cila (HvA), Shihan Wang (UU)

Livinglab: Wanda Kruijt (KIEN), André Harinck (DrieGasthuizenGroep), Christiaan van Driel (Zorgcentra de Betuwe), Yvonne van Duin, Diana Geraerts (Zuidzorg), Bianca Buurman (A'dam UMC), Marco Seldentuis (Woonzorg Flevoland), Frans Lefeber (Smart Floor), Igor Kluin, Kris van Aalst, Michel Smit (Energy Floors), René ter Borg, Teus Speksnijder (Nora), Adrie van Duijne (Sherpa BV), Derrek van der Burg, Jelger Lemmens, Wilfred van der Plas (Simaxx), Ruurd Bell, Mike Oudshoorn, Ivor Swaab (illi-tv)

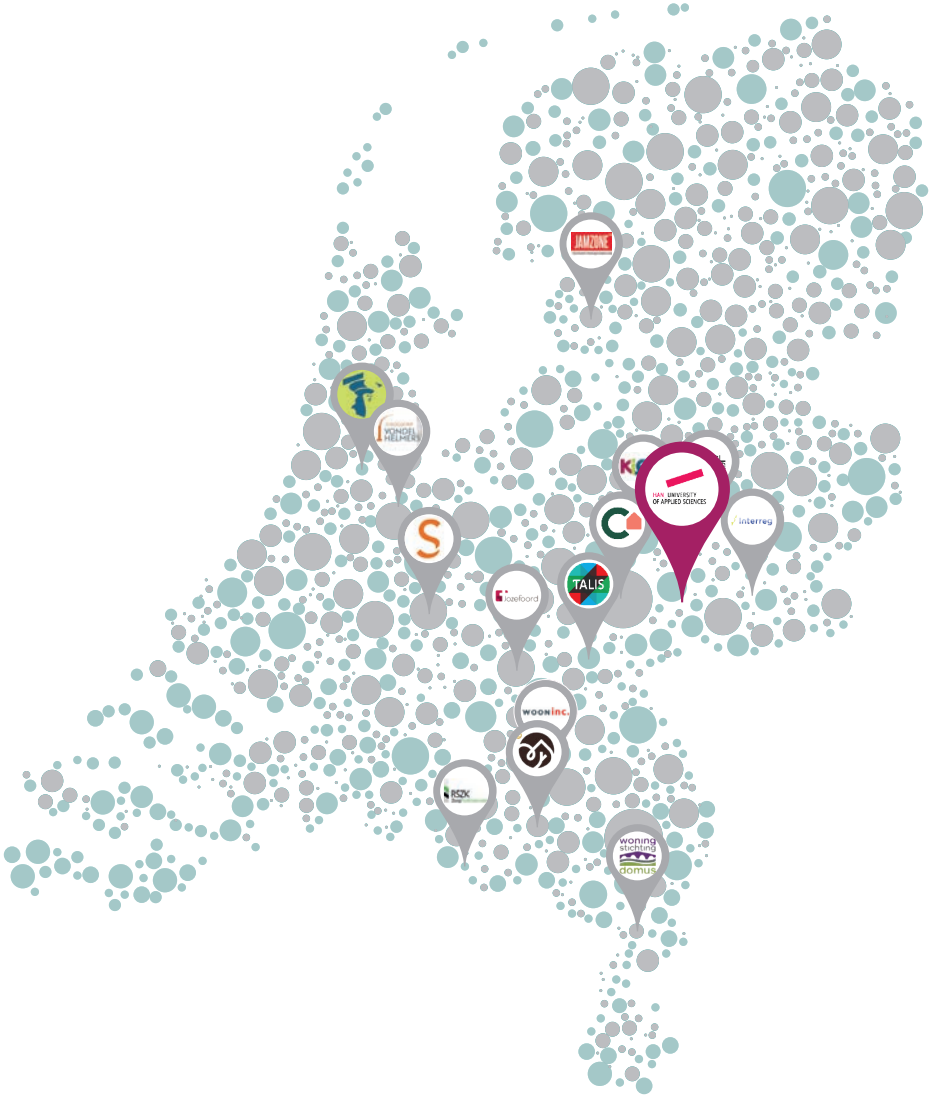
Livinglab project 'Motel Spatie' (Social Organization Motel Spatie)

Onderzoeksteam: Masi Mohammadi, Toine van Lieshout, Erik Groen, Robbert van Bezooijen (HAN)

Our homes take care of us.

Livinglab HAN University of Applied Sciences

HAN_UNIVERSITY OF APPLIED SCIENCES



The Empathic Home

HAN_UNIVERSITY OF APPLIED SCIENCES

The home as a carer

The Livinglab

The elderly care system requires a fundamental change in how and where we provide care. In the coming years, the home environment will remain the most critical location for care delivery and home technology will play a crucial role in this.

Individuals with dementia often have difficulties with daily routines and activities that go along with it. They may become more passive and sometimes get lost. Their forgetfulness can disrupt their daily and nightly routines and eating patterns, which can cause them to decline more quickly. Caregivers often help with daily activities such as eating, getting up and going to bed. But is it possible for a house to take care of these tasks? Can we develop a house that takes care of someone? A 'smart' home that guides the resident in their daily life? In the Empathic Home livinglab we are researching the possibilities of developing a home that can provide assistance with daily activities and promote self-reliance for individuals, particularly those with

△ *Scientific Director Masi Mohammadi voor de Empathische Woning. De empathische woning is een proefwoning op het IPKW-terrein te Arnhem. (Fotografie: Marc Pluim Fotografie).*

◁ *In de Empathische Woning wordt technologie ingezet om mensen met dementie langer thuis te laten wonen.*

dementia and chronic illnesses. By integrating advanced technology, these homes have the potential not only to assist individuals with chronic conditions, but also to promote disease prevention by stimulating individuals' ability to cope with physical, social and emotional challenges in life. In the Empathic Home, the focus is on technological possibilities that promote self-reliance. We develop a personalized approach and use intelligent, adaptive technologies, so that the developed design solutions meet the current and future needs and preferences of residents.

To develop innovative design solutions, it is essential to bring together parties from various sectors such as technology, construction and healthcare in a collaborative process. The Empathic Home is based on a 'standard' house in social housing and can function as a caregiver. From this foundation, various projects have been initiated that involve co-creation with different parties to take concrete shape. In the Empathic Home, we experiment with both spatial, social and circular aspects and use sustainable materials and solutions. For instance, the Empathic Home not only includes a heat pump but also an 'active' attic (smart, circular, temporary, lightweight, transportable, energy-providing, sustainable) that brings additional daylight into the underlying house. The house, located at the De Kleefse Waard industrial park, serves as a laboratory for knowledge transfer and the practical application of theoretical concepts from research projects on smart living environments.

The objective

The projects within the Empathic Home aim to create innovative design solutions for constructing homes for vulnerable people, particularly those with dementia, but also for children with autism or people with disabilities. We are exploring how incorporating user-centered technology in the living environment can positively impact the health and well-being of (vulnerable) residents,

with the objectives of enhancing self-reliance and community support, minimizing perceived vulnerability and minimizing associated societal costs.

The outcome so far

The Home has been used for several years as a showcase for those interested in the latest technology, as well as a testing location for projects in which technology is tested, first user tests are carried out ór tests that are supplementary to research in livinglabs. The Home is increasingly being used as a hybrid learning environment for both professionals and students. Students frequently work on projects within the Home, and it also serves as a venue for inspiration afternoons for various organizations, companies and residents. The technology used in the Home can also be applied to other projects, such as the Smart Neighbourhood Malvalaan project.

Partners:
HAN: Architecture in Health

Duration:
May 2014 - present time

The supporting cooking stove for people with dementia

Liesbet Rabbinge, designer, and Maya Sappelli researcher at HAN

Column

Cooking can be a source of concern for individuals with (early-stage) dementia and their caregivers, as they may forget to turn off the gas after cooking or even forget that they are cooking, which can lead to dangerous situations. However, what if technical aids could assist individuals with dementia while they cook? For example, what if these aids could provide a warning when the potatoes are about to burn? What if these aids were easy to use and intuitive, while also being effective at mitigating the risks? These aids could help individuals maintain their independence, as they would only intervene when necessary and be adapted to the user's needs.

Digital Twin

The COOK3R brings us one step closer to a cooking solution for individuals with dementia. This cooking stove is a product innovation from the Empathic Home. In the COOK3R SIM project, we are developing software that improves the adaptive capacities of COOK3R and other product innovations for people with dementia, allowing them to adjust to its users. Essentially, we are making the product 'smart.' The cooking stove learns how to respond appropriately to seniors with dementia and guide them in their cooking. We achieve this by creating a 'digital twin' of the product innovation. This digital twin is a virtual version of the physical product, allowing us to safely expose the product to various scenarios.

By trying out actions and making mistakes, the virtual COOK3R learns which cues to give in order to prompt users to perform the correct actions at the right time. To accomplish this, we use simulations, allowing the model to be exposed to as many scenarios as possible without creating any dangerous or unpleasant situations for vulnerable individuals. As a result, the COOK3R knows in every scenario and for every individual what the most effective way is to achieve a healthy and safely cooked meal.

◁ *Prototype 3 of the COOK3R guides the cooking process step by step.*

Customized solution

Using the insights gained by the virtual COOK3R in simulated scenarios, we calculate an algorithm that outlines how the COOK3R should behave in different situations. We then apply this algorithm to the real COOK3R, making it adaptive and capable of continuously learning from its user. For example, the COOK3R may learn that a particular individual responds better to an auditory alert instead of a visual one. By considering the needs and preferences of the target audience, we can develop software that caters to different types of users.

Towards a real product

The COOK3R SIM project is a collaboration between the Architecture in Health (AiH) Lectorate, the Center for IT & Media Design (CIM), and the Edomah program. If we manage to give the COOK3R adaptive capabilities, we will be able to safely test the cooking device in people's homes for an extended period of time. This brings us closer to the possibility of working with ATAG to develop a real product. In this way, we aim to contribute to enabling people with dementia to live comfortably at home for a longer period of time with the help of COOK3R and other smart care products.

Research with caregivers on the use of prototype 2 of the COOK3R. ▷


EMPATHISCHE W

Learning Community

Inspiration afternoon De Alliantie and Cordaan: ‘Domotics for seniors, understanding the end-user.’ A project in collaboration with The Innovation Lab and Holland ConTecht & PropTech.

‘What an inspiring knowledge session and workshop on empathic homes and the possibilities to promote ageing in place.’ Wouter Truffino, Founder and CEO Holland ConTech & PropTech.

◁ *The participants are discussing a smart living environment wich each other at the Empathic Home, April 2021.*

With citizens in charge, Smart Art offers opportunities for communal reliance.

Livinglab Urban Village VondelHelmers

STADSDORP VONDEL HELMERS

It takes a village to grow old

STADSDORP VONDEL HELMERS

Enhancing neighbourhood cohesion with Artificial Intelligence (AI) art

The Livinglab

IIn the Vondel/Helmers neighbourhood in Amsterdam, 93% of the residents are satisfied to very satisfied with their living situation. If residents have to move, two-thirds wish to remain in the neighbourhood, even if they become more vulnerable or develop dementia. The local neighbourhood-based citizen collectives Urban Villages want to contribute to this. They focus on community support (i.e., neighbourhood), so that people can 'keep participating' for as long as possible.

Social relationships and interactions in the neighbourhood play a role in this effort. This stimulates the community support of neighbourhood residents, and in particular of people with early-stage dementia. Artificial intelligence artworks are rich in interaction and foster social relationships. In practice, however, not all neighbourhood residents are equally heard in the design of these works. That should

△ *A conversations with residents of Urban Village VondelHelmers, Amsterdam, about their neighbourhood using a map of the Urban Village.*

◁ *All participants in the Livinglab are equal (citizen science). Working together in co-creation on the development and implementation of an AI art project (Illustration: Kalle Wolters).*

be improved. The project “It takes a village to grow old,” therefore examines how to work with residents to create a dementia-friendly neighbourhood. The outdoor space in the Urban Village Vondel/Helmers serves as a Livinglab for this effort.

The objective

The project has two main objectives: firstly, to explore the potential of extreme citizen science, where citizens lead the research with scientific guidance, to improve social interaction through AI-based art interventions in public spaces. And secondly, to study the design of these AI-based art interventions.

The method

The project combines participatory action research with the Empathic Design Framework to study with residents how to adapt ‘fourth places,’ public spaces where people gather, to enhance social cohesion among diverse neighbourhood residents and stakeholders. To do so, residents were asked to keep a diary of their regular walking routes to identify intersections where multiple residents converge as potential locations for interactive art. Residents were also asked to take photos (photovoice) of places they find pleasant and unpleasant.

The outcome

Based on the initial results of the needs assessment we have adjusted our approach, and are now analysing the initial findings.

What is the perspective of the project partner regarding the Livinglab?

Collaborating on this research for several months has resulted in improved mutual understanding and communication. Both the professionals and residents have gotten to know each other better, and the same is happening among the residents themselves. There seems to be a supportive atmosphere where everyone is considerate of each other. The collaboration between professionals and residents allows them to jointly steer the direction

of the research and shape its potential outcome. For residents, this makes the art and technology more manageable and meaningful.

Residents, professionals, and researchers are working together to enhance neighbourhood cohesion in the Urban Village (Illustration by Kalle Wolters).

Partners:
Urban Village VondelHelmers
TU/e: Smart Architectural Technologies
Leyden Academy
Amsterdam University of Applied Sciences
University of Amsterdam
illi-tv
WG-Kunst
Foundation 'Mantelzorg' & Dementia
Cliëntenbelang Amsterdam

Duration:
April 2022 - March 2024

This project is funded by Health~Holland in partnership with ZonMw. For more information, please visit: www.health-holland.com/ project/2022/2022/it-takes-village- grow-old

“I want to bridge the gap between the world of daily life and the world of systems”

Interview

In conversation with Marja Peltenburg from Urban Village VondelHelmers

“I’ve noticed that seniors often tend to wait for what care or science can offer them. However, I believe that if you have a voice, you should use it. It’s important to clearly express your feelings and needs to ensure a successful collaboration with care and science, resulting in an appropriate outcome,” says Marja Peltenburg, a core team member of Urban Village VondelHelmers who is currently working on the design of an art installation for the outdoor space.

Modern community spirit

The Urban Village is part of a network of 26 Urban Villages in Amsterdam. When the network was asked by TU/e to find an innovative Urban Village willing to collaborate on research for an interactive object in the outdoor space, VondelHelmers immediately agreed. Marja said, “ The Urban Village had been in existence for several years, and we had fallen into a routine. We wanted to become more dynamic again and find ways to modernize our community spirit.”

And by modern, Marja means a safe and pleasant living environment where people can meet each other in a light-hearted way. “As you get older, your environment becomes smaller. I noticed this myself after retiring. I am able to shape my life, but I realize that my range of activity is decreasing. So, it’s nice to become more involved in the neighbourhood. An inviting environment with the opportunity for a stroll, to be able to say ‘hello’ and to be seen and recognized. An art object in the outdoor space can contribute to that.”

Citizen science

What drew Marja to the project was the opportunity to collaborate through citizen science: “I want to bridge the gap between the world of daily life and the world of systems. Science, healthcare, and residents don’t always speak the same language.” Marja finds the collaboration with the TU/e and others to be a fascinating process:

◁ *Marja Peltenburg is core team member of Urban Village VondelHelmers.*

“It’s become clear that we need to work hard to understand one another, and we’re willing to invest the time and energy to do so.”

That’s why the Urban Village took the scientists on a walk through the neighbourhood. “We allowed the professionals to experience the area of Urban Village VondelHelmers, and they, in turn, provided us with workshops on public familiarity, art and architecture, and artificial intelligence.”

Marja smiles, “We learn a lot from each other, both the scientists from us and vice versa. I am impressed with how easily they deal with technology. They see many possibilities, also for using it in a safe way. I think it’s important that we take advantage of those possibilities. However, it is necessary that we understand what the scientists are doing and how they ensure safety. If technology becomes meaningful for everyone, people will use it better than if it is offered without context.”

Marja is hopeful that the two worlds will come closer together: “We all want to do something for a pleasant environment in which we can live well.”

‘ I believe that if you have a voice, you should use it. ’

- Marja Peltenburg
Urban Village VondelHelmers

Buildings influence the sleep of people with dementia

Livinglab Santé Partners

Santé Partners

Dementia and indoor climate

Santé Partners

Data-driven design that is user-centered

The Livinglab

People with dementia are highly sensitive to indoor environmental factors such as air quality and humidity. These factors can exacerbate behavioural issues, adding additional strain on caregivers.

Santé Partners is actively seeking ways to support residents, families, and staff by optimizing the living environment so that these problems can be reduced or prevented.

△ *Sensors in the activity room.*

◁ *Corridor in the nursing home where sensors have been placed to measure the indoor climate.*

The objective

The objective of the research is to develop an integrated approach for improving the living standard in nursing homes.

The method

The research is conducted by using a variety of qualitative and quantitative research methods such as an analysis of sensor data from the nursing home, a qualitative data collection and analysis of residents with dementia from nursing homes, diary notes from nurses, and interviews.

The outcome so far

The project offers and validates a preliminary method for collecting data from seniors with dementia. Some problematic behaviours, such as wandering, were identified through both sensor data and diary notes. By using non-intrusive monitoring technologies, caregivers gain timely insight into living conditions and can provide care when necessary.

It was also found that residents were sometimes exposed to low humidity and high CO^2 concentrations, requiring an intervention to improve their living standards. These problems were found to be a result of centrally controlling the mechanical ventilation and floor heating.

Due to COVID-19 guidelines, we were unable to collect data on the subjective experience of seniors regarding comfort and preferences. The information used may not accurately reflect their experience and feelings.

Partners:
Santé Partners
TU/e: Smart Architectural Technologies

Duration:
September 2020 - August 2022

◁ *Researcher Chuan Ma presents his preliminary results during the international CLIMA Converence 2022.*

EMPATHIC LIVING LABS

'Op weg naar een slimme woonzorgomgeving'

'SLIM WONEN ONTZORGT'

A set of architectural design patterns and for age friendly homes

huisvesting

HET

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Developing an Intelligent Environment to Support People with Early-Stage Dementia: from User-Needs to a Real-Life Prototype

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Abstract. Intelligent environments can offer support to people with early-stage dementia, who often experience problems with maintaining their circadian rhythm. The focus of this work is developing a prototype of an Intelligent Environment for assisting these people with their daily rhythm while living independently at home. Following the four phases of the Empathic Design Framework (Explore, Translate, Process, and Validate), the needs of people with dementia and their caregivers were incorporated into the design. In the exploration phase, a need assessment took place using focus groups (N=12), observations (N=10), and expert interviews (N=27). Then, to determine the requirements for a prototype of an intelligent environment, the second phase, Translate, used three co-creation sessions with different stakeholder groups. In these sessions, Mind Maps (N=55) and Idea Generation Cards (N=35) were used. These resulted in a set of 10 requirements on the following topics: context-awareness, pattern recognition, adaptation, support, personalization, autonomy, modularity, dementia proof interaction, costs, data, and privacy. Finally, in the third phase, the requirements were applied to a real-life prototype by a multidisciplinary design team of researchers, (E-Health) tech companies, designers, software engineers with representatives of eight organizations. The prototype serves as a basis for further development of Intelligent Environments to enable people with dementia to live longer independently at home.

Keywords. intelligent environments, dementia, ambient assisted living, ubiquitous computing, pervasive computing, elderly, healthcare

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Learning Community

Every year, several scientific articles, professional publications, manuals and tools are published about the activities and results in our livinglabs.

◁ *Collage of scientific articles and professional publications about our livinglabs.*

The quality of living of people with dementia is strongly influenced by the quality of a space.

Livinglab St. Jozefoord

Space for Sustainable Happiness

Jozefoord

A living environment that promotes the quality of life

The Livinglab

Residents with dementia are often so vulnerable that they are completely reliant on their physical and social environment. As a result, they have little influence on their quality of life. It is therefore essential that the living environment meets the needs of these residents. At the same time, we believe that the requirements we set for the living environment for people with dementia also increase the standards for a regular living area. If someone with dementia can orient themselves better in a building due to an improvement in the situation, this may also apply to someone without dementia. In other words, the lessons we learn when improving the living environment for people with dementia may also be relevant for housing for seniors without dementia.

Nursing home Sint Jozefoord is a Livinglab in which the empathic living environment for today and for the future is being built and tested in practice. How can the care facilities of Sint Jozefoord transform

△ *Presentation of researcher Joyce Fisscher during the 2018 New year's reception about the developments of the past, present, and future of St. Jozefoord.*

◁ *The old chapel of St. Jozefoord.*

Learning Community

Every year, DEEL Academy organizes the ‘Het Nieuwe Wonen’ Conference in the Netherlands. Sharing knowledge, inspiring each other, and connecting with one another are the main objectives of these conferences.

◁ *Participants of the conference ‘Het Nieuwe Wonen’ in 2019 (photography: Charlotte van Buuren).*

into a stimulating living environment that improves the quality of life?

The objective

In this livinglab, we develop spatial and technological design solutions for the common spaces in the nursing home: the corridor and the living room. It is expected that neuropsychiatric symptoms, such as agitation, will decrease by improving spatial orientation for people, achieving a balance of stimuli and encouraging social interaction, so that the quality of life of residents in a care facility is improved.

The method

Research was conducted in four consecutive phases. Using literature research, observations, and questionnaires, the problems, limitations, needs, and possibilities of the target group were determined. This knowledge and experience was then translated into architectural design guidelines that improve spatial orientation and social interaction, and lead to balance in stimuli. These guidelines are divided into three building layers: objects, surface finishes, and spatial design. These guidelines were integrated into design solutions that are suitable for the context.

These design solutions were developed in collaboration with the organization. And applied in a new construction project and a renovation project. Finally, the effects of the realized design solutions were studied in five experiments.

Living Painting

In the dining area of the living room of St. Jozefoord, a ‘living painting’ was created: a television screen showing a loop of a calming moving image. In this case, swimming fish and a pond with a duck floating in it. The living painting provides residents with a peaceful, constant, dynamic stimulus. This stimulates the balance of stimuli and spatial orientation, reducing agitation in residents.

Partners:
St. Jozefoord
TU/e: Smart Architectural Technologies

Duration:
April 2017 - March 2019

The outcome

The solutions have been recorded in ‘inspiration boards’ that can serve as a starting point when drafting a program of requirements for new constructions or when renovating the living environment for people with dementia. These boards can also help in assessing small adjustments to the space. Additionally, the tool is a means to evaluate the existing space or the design of a space in terms of how much the environment promotes the quality of life for residents.

Livinglab ‘living painting’ in a corridor of St. Jozefoord. ▷

Guiding environments provide clarity for people with dementia.

Livinglab KIEN and DrieGasthuizenGroep

DrieGasthuizenGroep
Zorgzaam en gastvrij sinds 1246

The Guiding Environment

The design of an environment that stimulates and supports seniors with early-stage dementia.

DrieGasthuizenGroep
Zorgzaam en gastvrij sinds 1246

The Livinglab

Seniors with early onset dementia may have difficulty maintaining a regular sleep and wake cycle, which can result in issues like social isolation, increased risk of fall, malnutrition, dehydration, and health problems. If more seniors with dementia continue to live independently at home, it is important to find solutions for this loss of sleep-wake cycle. We are exploring how to design a guiding environment, an adaptive living space that responds to and anticipates the needs of seniors with early onset dementia. The Empathic Home is our experimental site and the first users have been interviewed on location at the DrieGasthuizenGroep care home.

△ *Signals in the home support the residents in their daily activities.*

◁ *The Guiding Environment implemented in the Empathic Home in Arnhem. With the help of technology such as projections and light, the residents with dementia is supported in their daily routine. (*'Richtingaanduiding' means Wayfinding)*

The objective

Our aim is to develop a design concept for a Guiding Environment that enables seniors with early-stage dementia to remain in their homes for longer. The technology adapts seamlessly to the user and provides a safe and comfortable living environment. These technologies should simplify, not complicate the lives of seniors. Instead of monitoring their activity, they should encourage and assist the user, such as opening curtains in the morning, simulating bird sounds, and guiding seniors through their morning rituals with a warm and personalized voice. The COOK3R, the smart interactive stove, can also be of service when boiling an egg, for example.

The method

In collaboration with various stakeholders, a demo model of the Guiding Environment was developed and tested in the Empathic Home. This was done using the four phases of the Empathic Design Method.

In the exploratory phase, the needs of seniors with dementia were mapped out through literature research, interviews with carers and healthcare professionals, focus groups with seniors with dementia, and observations. In the second phase, these needs were translated into various usage scenarios. Design concepts were created during co-creation sessions with professionals. In the third phase, these usage scenario's were incorporated into a prototype of the Guiding Environment. In phase four, the first user tests were carried out in the Empathic Home and at the DrieGasthuizenGroep care facility. Parts of the project were tested with seniors with dementia.

The outcome so far

A first prototype of the Guiding Environment and a tool have been developed and offer a vision of what it will look like. The prototype is being

DrieGasthuizenGroep
Zorgzaam en gastvrij sinds 1246

refined in the Empathic Home, and the Guiding Environment tool, an interactive PDF that gives a clear understanding of the Guiding Environment's purpose and design, is being used to share the vision with stakeholders.

Two follow-up studies will be conducted to evaluate whether the projections, light and sound signals used in the Guiding Environment prototype are suitable and meet the needs and preferences of individuals with dementia. The prototype was evaluated with caregivers and professional care providers of this group. A follow-up project will start in September to further develop the Guiding Environment.

Partners:
Foundation KIEN
TU/e: Smart Architectural Technologies
HAN: Architecture in Health
Amsterdam University of Applied Sciences
DrieGasthuizenGroep
Smart Floor
Energy Floor
Nora Floor
Simaxx

Duration:
December 2017 - August 2024

This project is funded by RAAK-MKB, RAAK Impulse, RAAK Public and RAAK Top-Up. For more information, please visit: www.sia-projecten.nl/ project/de-interactieve-woonkamer- productevaluatie-door-zorgprofessionals

Regieorgaan SIA


MATISSE

Learning Community

deel

A short promotional video was made to promote the DEEL Academy.

Please see the video here:

◁ *Getting a behind-the-scenes look at a scene in the Empathic Home.*

Smart spaces stimulate sustainable behaviour patterns.

Livinglab Motel Spatie

The 4th Dimension

From vacant office space to a sustainable and liveable residential environment.

The Livinglab

In 2013, the Netherlands struggled with millions of square meters of vacant office spaces. At the time, it was assumed that this trend would continue in the future as a result of a shrinking government, ageing population, economic crisis, and the emergence of 'the new way of working.'

Vacant buildings are almost no longer a viable option for renting as office spaces, even when the market improves. They no longer generate revenue for investors. In addition, areas with many vacant offices have a ghostly character that negatively affects the attractiveness of the area. The social safety around empty buildings is poor and the buildings tend to have a lack of maintenance and upkeep over time.

At the same time, society faces numerous sustainability challenges that require a significant shift in behaviour. The Architecture in Health and SEECE (HAN) lectorate, along with industry

△ *The buildingteam of Motel Spatie.*

◁ *Students and researchers are building the livinglab of Motel Spatie themselves.*

partners, considered the feasibility of using smart technology for sustainable renovation of these ‘hopeless buildings.’

To research this, an office building was transformed into a temporary home. A ‘home’ for foreign artists who performed social-artistic work to increase social cohesion in this working-class neighbourhood and make sustainable behaviour visible.

The objective

The main goal was to promote social cohesion in the Presikhaaf neighbourhood (Arnhem, The Netherlands) by using art and technology, as well as promoting sustainable behaviour changes.

A secondary objective of developing the showroom and experimentation space was to create opportunities for collaboration among students from various disciplines at the HAN.

The method

Researchers, in collaboration with the Motel Spatie foundation, established the first livinglab. This lab entailed converting a vacant office building into a temporary residence for foreign artists who would engage in social-artistic projects in the neighbourhood. In the residence, students from HAN and TU/e were able to use and test smart applications aimed at making residents’ energy consumption visible.

The outcome

Several smart applications developed by students from TU/e were implemented in the livinglab, with the aim of promoting sustainable behaviour change. The smart designs made it visible when there was overconsumption. Although the products functioned technically, they were not always suitable for practical use. This livinglab was the precursor to Empathic Livinglabs in their current form.

Partners:
HAN: Architecture in Health
HAN: SEECE
TU/e
Motel Spatie Artist-in-residence
Corio Real Estate
Vitaal ZorgVast
Foundation KIEN

Duration:
September 2013 - July 2015

△ *Brainstorm session with researchers and students about the livinglab Motel Spatie.*

Theme: Living is More than a House

The housing of seniors and other vulnerable groups is a relevant and urgent issue for municipalities, housing corporations, and healthcare organizations. This is due to various societal changes, such as an ageing population, the participatory society, population decline, and government policy promoting extramuralization and the separation of housing and care. As a result more people are living longer at home, but their living environments often lacks adequate support. The increase in vulnerable populations affects the liveability of neighborhoods and villages, for example, due to the lack of resilient social networks or facilities. Adressing these challenges is a significant and shared responsibility for citizens, municipalities, housing corporations, and healthcare organizations.

At the same time, the application of technology in and around the home, such as domotics and healthcare technology, is promising. Socio-spatial-technological interventions contribute to increasing social interaction in the neighborhood to enhance the community support for residents.

Within the theme ‘Living is More than a House’, we go beyond exploring applications within the home. It is the outdoor space and the neighborhood where people live that can contribute to a higher quality of life. Our objective is to develop a ‘smart inclusive neighbourhood’ that knows its residents, empathizes with them, and, where possible, also takes care of them. Examples include smart measuring devices embedded in walls, lampposts or streets, which can form the technical infrastructure for security monitoring (such as a ‘digital fence’) or the promotion of social interaction. This can help create a neighborhood that supports and stimulates residents like nowehere else, and where the living environment fosters self-reliance, social inclusion, and community support.

◁ *Visualization of the theme Living is More than a House (image: Masi Mohammadi).*

Living is More than a House

Livinglab project Smart Neighbourhood Malvalaan (Housing Corporation Wooninc and Healthcare Organization Zorg in Oktober)

Research team: Masi Mohammadi, Leonie van Buuren, Anne Grave, Sophie Peters, Peyman Najafi (TU/e)

Livinglab: Anja van Lier (Wooninc.), Vivian Poulussen, Marit Janssen (Zorg in Oktober), Bram Daamen (Municipality Waalre)

Livinglab project 'The Art of Connection' (Social Organization Cohousing Arnhem (CPO))

Research team: Masi Mohammadi, Marleen van Beuzekom, Moniek van Loon, Gerald Gosselink (HAN), Jeroen van der Eijnde (Artez), Merel van Mansom (Windesheim), Simona Orzan (Fontys)

Livinlab: Peter Camp (Cohousing Arnhem), Tom Kortbeek (Filip Studios), Jolien de Gruijter , Eva Smit (Rijnstate)

Livinglab project 'Measuring emotions' (Healthcare Organization ZONL and Zorg in Oktober)

Research team: Masi Mohammadi, Coosje Hammink, Leonie van Buuren (TU/e)

Livinglab: Anneke de Munnik (ZONL), Rianne van Kaathoven (Zorg in Oktober), Bernard Maarsingh (Jamzone), Hans Achterbosch (Achterbosch Architecten)

Livinglab project 'Krake Living Communities'

Research team: Nienke Moor, Kim Hamers, Teun van Haren, Masi Mohammadi (HAN)

A smart living environment leads to greater equality within society.

Livinglab Wooninc. and Zorg in Oktober

WOONinc.

oktober
jouw verhaal, onze zorg.

Smart* neighbourhood Malvalaan

*The Dutch name of this project is *SLIMme wijk Malvalaan*, where SLIM stands for Social, Liveable, Innovative, and Human-centered.

A resident-driven neighbourhood that connects and activates

WOONinc.

oktober
jouw verhaal, onze zorg.

The Livinglab

In several residential areas in the Netherlands, the number of vulnerable elderly people is increasing. They often require social support or home care, while fewer people are able to assist their neighbours. The increase of vulnerable groups in the neighbourhood also seems to affect social cohesion and liveability.

Social and technological innovation can help improve social cohesion and liveability, as long as they are well integrated into the neighbourhood. In Aalst-Waalre, The Netherlands, Wooninc. and Zorg in Oktober have joined forces to develop a smart, resident-driven neighbourhood at the Malvalaan. A smart neighbourhood means that the neighbourhood is socially healthy, liveable, innovative, and people-oriented. In the neighbourhood, we apply spatial, technological, and social innovations that support and encourage (vulnerable) residents so that they can live independently for as long as possible.

△ *With the help of virtual reality and a digital twin, resident scan discuss the design of the neighbourhood at an expert level. (Images: Peyman Najafi).*

◁ *An impression of the Smart Neighbourhood Malvalaan, in which social, spatial and technological aspects such as sensors that can guide people, are integrated (Image: Masi Mohammadi)*

The Livinglab comprises of three social rental apartment complexes with 120 apartments that will be renovated to accommodate individuals 55 years and older. Furthermore, a new care facility will be built to accommodate 80 seniors with dementia. Additionally, the public space surrounding the buildings will be redeveloped to foster an environment that promotes the well-being of seniors.

The objective

The objective of this project is to create a smart neighbourhood. We are seeking social, spatial and technological design solutions that encourage spontaneous and planned interactions, enhances mental well-being, promotes independent living at home and enables people with advanced dementia to safely navigate the neighbourhood. Additionally, we are working on various ways to involve residents in the process.

The method

We use a variety of methods, such as the research street fair, idea generation posters, and group interviews, always making sure to involve future residents in the process. We also use innovative methods such as a digital twin: a digital simulation model of the Malvalaan area. By using virtual reality, we can present design concepts to residents.

The outcome so far

We have developed design guidelines to encourage social interaction within the neighbourhood. These guidelines have been further developed into spatial design concepts, which were used to create a digital twin model of the neighbourhood. By using virtual reality we can validate these design concepts with residents.

The needs research among seniors was used in the development of a master plan for the area. Subsequently, 36 master students were involved

oktober
jouw verhaal, onze zorg.

in the project, creating various urban planning and architectural designs for the area.

We have also prepared a policy document on how to involve vulnerable seniors in spatial design research and developed a participation tool.

In addition, we arranged multiple resident engagement activities, such as a street fair where residents could actively participate in the research. And soon, we will be opening a designated space on the Livinglab site where residents can drop by and participate in research related to their neighbourhood.

△ *Impression of the Smart Neighbourhood Malvalaan, where social interaction is at the core. (Image: Masi Mohammadi).*

What is the perspective of the project partner regarding the Livinglab?

Wooninc:
The research has enabled Wooninc. to gain a deeper insight into the social interaction desires and requirements of residents and those living in the surrounding area. Through collaboration, we have come to better understand one another and the respective organizations, interests, and needs. This has led to the development of a joint concept-urban plan that addresses both the individual and collective goals and objectives of the project, as well as the desires and needs of the residents and their neighbours. We also make use of previously gained knowledge and information obtained from other Livinglab projects.

Oktober:
The Smart Neighbourhood project aims to acquire knowledge about community building, social empowerment in combination with suitable housing forms, and the application of technology in the area surrounding Malvalaan. This acquired knowledge leads to a new way of looking at and realizing the care home ‘t Laar. Involved parties have a better understanding of each other and involve neighbourhood residents in this development.

Partners:
Wooninc.
Zorg in Oktober
Municipality Waalre
TU/e: Smart Architectural Technologies

Duration:
2020 - 2024

This project is also funded by NWO and ZonMW. For more information, please visit: www.nwo. nl/projecten/43819177-0 and www.zonmw.nl/nl/onderzoek-resultaten/preventie/maak-ruimte-voor-gezondheid/

Municipality Waalre:
The project has concretely resulted in bringing parties together at an early stage to consider the area in a holistic way. Rather than focusing solely on individual buildings, the area as a whole is being taken into account, with the principles of *Social, Liveable, Innovative, and Human-centred* as leading. The inclusion of multiple perspectives leads to more constructive discussion and, ultimately, a more effective functioning area.

What is needed to make the neighbourhood Voldijn social, liveable, innovative, and people-oriented? The residents of the neighbourhood shared their thoughts in various ways during a local street fair.

The street fair: from a virtual tour to co-building the Smart Neighbourhood

Column

Anne Grave, researcher at TU/e

The street fair

On a sunny Friday afternoon in September 2021, the gardens of Malvalaan are decorated with market stalls and flags. It is the street fair that marks the official start of the participation process of the Smart Neighbourhood Malvalaan. Over 80 residents of the Malvalaan buildings and other neighbourhood residents attend; all curious about what the Smart Neighbourhood entails and what they can contribute to the discussion.

Mental health and social interaction

Residents were given a virtual tour of the future neighbourhood using a digital twin model of the neighbourhood. By using this model, residents wera able to preview innovations and design proposals before construction commenced, and also offer feedback on the proposals.

In addition, there were various stalls where residents could converse with researchers. At one stall, people were able to build their ideal space for relaxation using LEGO bricks. Researchers then analysed the constructions and stories from participants, and incorporated them into design guidelines for the public spaces at Malvalaan. In this way, the environment can support the mental health of the residents.

In partnership with the livinglab project “Operation Meeting Space,” we facilitated a discussion with residents about the upcoming meeting space to be built on the premises. During the discussion, residents were asked for their input on the design of the space; who should have access to it, and what types of activities could be organized there? This collaborative approach ensures that the meeting space meets the needs and preferences of the community it serves.

However, encounters don’t just happen in meeting rooms; they can occur in hallways or public spaces as well. As part of the Smart Neighbourhood project, we are investigating ways to encourage

◁ *Impression of the street fair at livinglab Smart Neighbourhood Malvalaan.*

spontaneous interactions. Therefore, we asked residents to vote on various landscape design options, such as different styles of footpaths that varied in shape, width, and material. After all, the footpaths in public space can support informal social contacts and increase public familiarity within the neighbourhood.

The research of the TU/e translates into the livinglab Malvalaan

The Smart Neighbourhood is set to become a livinglab, which means that the neighbourhood of Malvalaan is continuously under development. New ideas will be put to the test in real-world scenarios, with residents invited to participate and contribute their thoughts, as was done at the street fair. Their ideas will be incorporated into the design of the Smart Neighbourhood, and subsequently retested. This approach ensures that residents' needs are fully integrated into the environment's design and that technologies can be implemented to support and inspire the residents.

The next steps

The street fair was just the beginning. We're committed to engaging residents and stakeholders in the design of the upcoming October healthcare building and the renovation plans for Wooninc's social housing units.

In September 2022, we will be launching an information point that will be open every week. Here, visitors can learn more about the design, construction, and renovation process, as well as participate in various research activities. We're also organizing an upcoming surroundings-dialogue where community organizations, researchers, and residents will come together to discuss the urban development plan.

Together, we will create a Smart Neighbourhood where residents are at the heart of it.

Researcher Anne Grave engaged in conversation with a resident about the design of the public. ▷


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jouw verhaal, onze zorg
WAALRE
EINDHOVEN
UNIVERSITY OF
TECHNOLOGY

Learning Community

In February 2020, the directors of Housing Corporation Wooninc. and Healthcare Organization Zorg in Oktober, the councillor of the municipality of Waalre, and the professor from Eindhoven University of Technology officially announced their collaboration.

◁ *Masi Mohammadi, Paula Nelissen, Liesbet Schouw and Angela Peijnenburg announce their official collaboration.*

Artificial intelligence brings neighbourhood residents together.

Livinglab Cohousing Arnhem

The Art of Connection

Towards a prototype interactive outdoor space that stimulates social interaction among neighbourhood residents

The Livinglab

In the creative neighbourhood of Coehoorn, the Netherlands, the Collective Private Contractor Cohousing Arnhem (CPO) is constructing an apartment complex. This development features a variety of homes for single individuals, couples, and families. The CPO is seeking to connect with the neighbourhood and exploring the potential of technology to enhance the semi-public outdoor space surrounding the complex. By creating a dynamic 'fourth place', can social interactions be facilitated between CPO residents and other vulnerable neighbourhood residents? They aim to design an interactive outdoor space that fits the DNA of the neighbourhood, with features such as seating that changes colour when occupied, wall projections depicting the history of the area, playful elements, and interactive triggers such as bird sounds or illuminated tiles, and a multi-functional outdoor kitchen. Cohousing Arnhem and the Architecture in Health (AiH) Lectorate are jointly conducting the project, "The Art of

△ *Visualization of a possible design of the park belonging to Cohousing Arnhem (image: Masi Mohammadi).*

◁ *Visualization of a possible design of the park with interactive art at Cohousing Arnhem (Image: Masi Mohammadi).*

Connection", to address this question.

The objective

The development of an interactive (outdoor) space that promotes social interaction between CPO residents and the neighborhood.

A secondary objective of the co-creation process in which neighborhood residents and other local stakeholders are actively involved is to form a learning community that increases the likelihood of a successful (sustainable) intervention.

The method

The research focuses on the development of an interactive (outdoor) space that aims to promote social interaction between residents of the Coehoorn neighbourhood in Arnhem. In co-creation with residents and stakeholders, the CPO develops a prototype of an interactive outdoor space in an iterative process. The HAN evaluates this pilot through a pilot study using big data, observations, interviews, and expert meetings.

The outcome thus far

Based on an exploratory needs assessment among future residents and other stakeholders, guiding requirements and wishes were formulated and 8 personas were established. An interactive meeting with stakeholders started the creative process of designing interactive outdoor spaces. A 'design letter' is currently being drafted, serving as the starting point for solution-designs that Fillip Studios will create in co-creation with the different target groups. Conversations are taking place with all partners to pool all expertise for this project.

In the learning community, the project partners and other interested parties exchange information on the way a CPO operates, interactive outdoor spaces and art, creating involvement and a learning community as a 'boundary object' to stimulate interaction.

A group of students from the minor Smart Healthy Environments of the Architecture in Health Lectorate of the HAN also conducted research into the needs within Coehoorn and how an interactive outdoor space could look like. Based on a list of ‘requirements’, they made a design in the form of a model for the future park, which serves as inspiration for the Art of Connection project group.

What is the perspective of the project partner regarding the Livinglab?

Peter Camp, initiator

What has the project yielded thus far?
The Art of Connection plays a significant role in the development of Coehoorn Creative Neighbourhood, promoting and creating a cohesive vision for connection and social cohesion in the community. Aligned with the DNA of the emerging hotspot, it establishes a foundation for socially responsible and creative interventions in the context of the larger goal of social health: reducing healthcare demand.

Interactive presentations and a creative approach generate enthusiasm. During the research process, which involved group interviews, filming, and generating ideas, involvement with the research subject and among participants was fostered through meetings and connections between members of Cohousing Arnhem, students, researchers, and other neighbourhood residents. This led to learning opportunities and the formation of new relationships among neighbourhood residents. These initial steps contribute to social sustainability and community engagement.

The Art of Connection also plays a role in connecting Cohousing Arnhem with other key players in the Coehoorn neighbourhood, both during the planning and construction phases. The research group collaborates with stakeholders in the Coehoorn neighbourhood, including creative businesses, local government and developers of new construction projects. The role of Fillip Studios, being a company located in the neighbourhood, enhances the connection of the Cohousing Arnhem community to existing and new neighbourhood networks.

What is the added value of the collaboration?
For Cohousing Arnhem, participating in this project is both interesting and crucial. Collaborating with the research group members and other participants to identify the necessary components for area development at an early stage is attractive.

As one of the initiators of Cohousing Arnhem, I am eager to achieve our goals, not only on paper but also in practice: walk your talk. I am always enthusiastic about innovative and creative approaches and this livinglab aligns perfectly with our objectives. I am delighted that we have the opportunity to work together for two years to assess possible interventions. I am also excited about the way we will gain new knowledge together and find ways to collaborate with the consortium and other stakeholders to create one or more interactive artworks.

Partners:
Cohousing Arnhem (CPO)
HAN: Architecture in Health
Filip Studios
Rijnstate
Windesheim University of Applied Sciences
Energy Floors
Artez

Duration:
September 2021 - september 2023

This project is funded by the directing body SIA in partnership with Health~Holland. For more information, please visit: https://www.health-holland.com/project/2021/2021/art-connection-how-interactive-art-improves-social-interaction

Co-creation is also about managing expectations

A conversation with Tom Kortbeek from Fillip Studios

Interview

For Fillip Studios the DEEL-collaboration at The Art of Connection is extremely valuable: the extensive research into the need of residents and their opinions about the outcome provides valuable insights and information that allows us to develop creative projects with significant social value. And all of this is happening in the neighbourhood where we ourselves are located.

Design brief

From an outdoor kitchen to an interactive dance floor; ideas for the interactive outdoor space at Cohousing Arnhem are still being explored in all directions. And that is perfectly fine at this stage of the process. Fillip Studios is responsible for processing the information gathered about the desires and needs of residents and clients for the outdoor space and transform this into an interactive design, which will be done in different phases.

Following an exploratory needs assessment and consultation with all involved partners, Fillip Studios has drafted a design brief. “In essence, it primarily outlines what the design should not be,” says Tom Kortbeek, owner of Fillip Studios, with a laugh. “We want to avoid creating a design that no one will benefits from or that is overly complicated to use.” However, Tom admits that he has found the results of the needs assessment to be extremely valuable. “The needs assessment was very thorough and has provided us with a great deal of insight.”

For the team at Fillip Studios, the real work is about to start. Through an iterative process, the studio will work closely with the residents to develop a design for the outdoor space. “In the initial session, we gather ideas from the residents and share our own,” explains Tom. “We then create a first design and receive feedback from the residents. Based on their input we will adjust and discuss these adjustments with the residents. This process will repeat a few times until we arrive at a final design.”

◁ *Designer Tom Kortbeek from Fillip Studios.*

Tom finds this process to be very valuable as well. “It allows us to experiment and receive immediate feedback,” he explains. “Moreover, we work collaboratively to determine the best way to design a co-creation process. And if an approach does not work, it still provides valuable information. Failure is acceptable in an experimental setting.”

Impact through wonder

The project aligns well wilt Fillip Studios’ mission statement. “We want to make an impact through wonder,” says Tom. “With the interactive design for the public living environment, we create frameworks within which people connect and engage in meaningful experiences.”

And for the seniors who live there, it’s even more important to use modern technologies in an accessible way. “For another project, we developed a wall made of black fabric that produces music when touched.”

“You’ll naturally go on a journey of discovery, in an analogue way, while complex digital techniques are used in the background. We want to achieve this accessibility at the CPO as well.” It is extra rewarding for Tom that with this project he can contribute to the community in the neighbourhood where the studio is located.

Expectation Management

Tom is careful to manage expectations about how much the design will actually contribute to building connections between people. “It’s just one of many potential tools,” he says. “We don’t want to give the impression that this design alone will lead to significant connections between neighbours. That’s also part of our work in co-creation: to be clear about what is feasible within the given budget and timeframe. One thing we can say for certain is that the process of co-creation itself has already helped forge some wonderful connections.”

‘ Our interactive design for the public space provides a framework for people to connect and engage in meaningful experiences. ’

- Tom Kortbeek
Fillip Studios

Learning Community

At a meeting organized by the livinglab project The Art of Connection, residents of Cohousing Arnhem, researchers, and students shared knowledge, experiences, and needs with each other.

◁ *Peter Camp is speaking with the guests during a residents' meeting.*

Understanding the emotions of the residents leads to a suitable design.

Livinglab ZorgGroep Oude and Nieuwe Land and Zorg in Oktober

ZORGGROEP
Oude en Nieuwe Land

oktober
jouw verhaal, onze zorg.

Measuring emotions

ZORGGROEP Oude en Nieuwe Land

oktober
jouw verhaal, onze zorg.

About the manner in which spaces impact the behaviour of people with dementia

The Livinglab

Buildings and their design have an impact on people. The living environment can both have a positive and negative influence on the behaviour and quality of life of people with dementia. But if we want to research this, we can't rely on interviews, conversations, or questionnaires: people with dementia often find it harder to express themselves verbally. So, we need other ways to map the behaviour and experiences of people with dementia, so that we can use that information to design a good living environment for them in the long term. That's why we're conducting different types of measurements in two care institutions in the country- ZONL and Zorg in Oktober- to map the daily behaviour of residents with dementia in their care institutions.

△ *Researcher Coosje Hammink experiences new designs for care organizations ZONL by Achterbosch Architects through virtual reality.*

◁ *Living room of a care facility of ZONL where the daily behaviour fo residents with demantia has been observed.*

The objective

We want to gain insight into the relationship between spatial design, the activities that seniors with dementia undertake, and the effect it has on their emotions.

The method

We use a variety of methods. We examine the spatial layout, such as the arrangement of corridors in the care facility. We also observe and document the daily patterns of residents, including frequently used routes. Lastly, we track and record emotional responses of individuals through both observations and the use of biometric sensors.

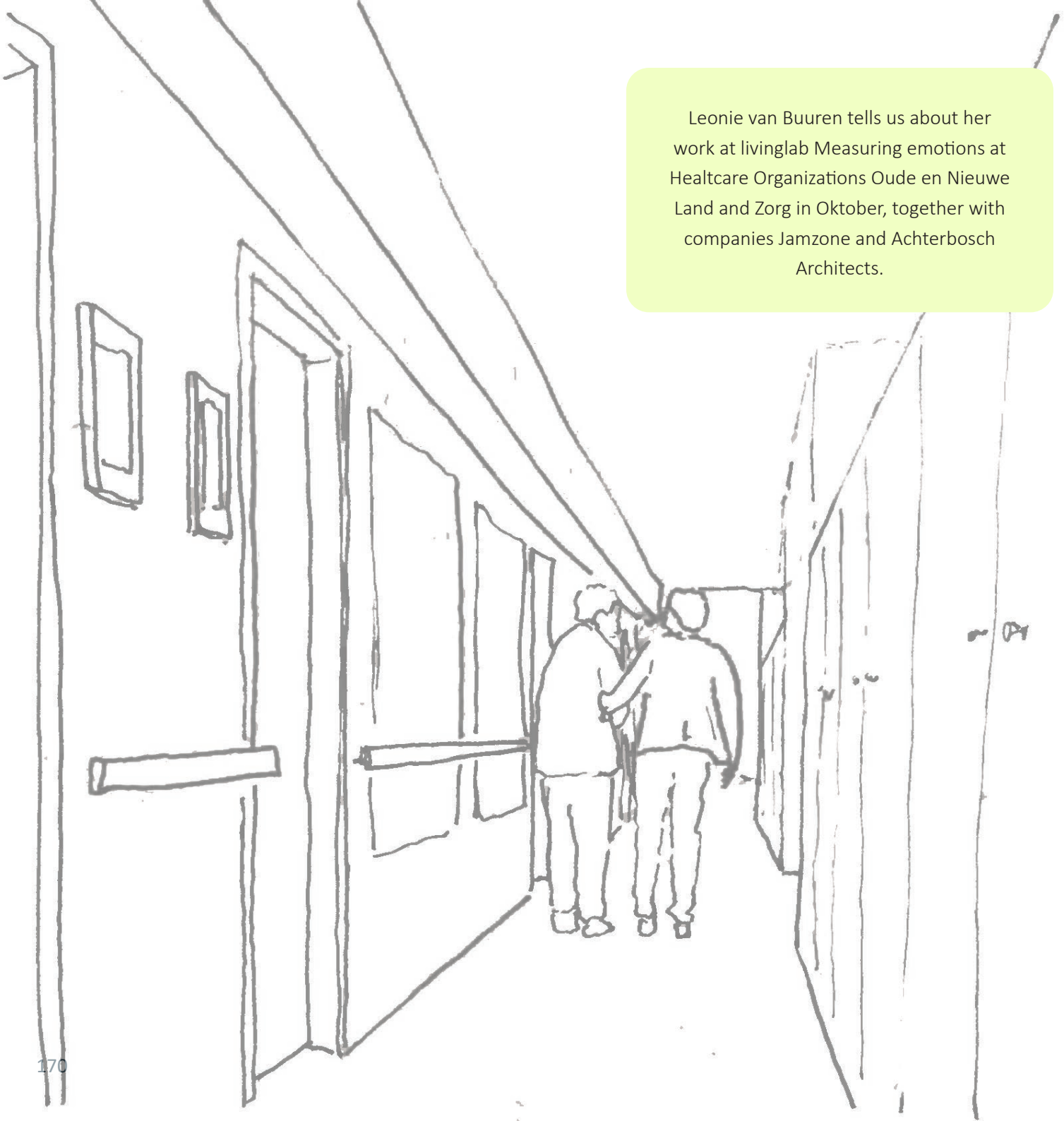
The outcome so far

We have conducted measurements in both care institutions. The daily behaviour of residents with advanced dementia has been mapped in the corridors and living rooms of the nursing homes. Additionally, using sensors, we have been able to measure the emotional responses of residents during daily activities such as communication, movement, eating and drinking, playing games, and idling. We are currently analysing the results.

Partners:
Jamzone
Healthcare Organization Oude en Nieuwe Land (ZONL)
Healthcare Organization Zorg in Oktober
Achterbosch Architects
TU/e: Smart Architectural Technologies

Duration:
March 2021 - July 2023

◁ *Researcher Leonie van Buuren is playing a virtual reality game where she can advance using her emotions, which are measured by Jamzone's sensors.*



Leonie van Buuren tells us about her work at livinglab Measuring emotions at Healtcare Organizations Oude en Nieuwe Land and Zorg in Oktober, together with companies Jamzone and Achterbosch Architects.

The daily hustle and bustle in nursing home corridors: my head full of stories

Column

Leonie van Buuren, researcher at TU/e

In this livinglab, we are investigating how the daily patterns of people with dementia and the built environment affects their emotions. To do this, we first need to map out their daily routines, which we do through observation.

In practice, this means that I spend the entire day sitting in a chair, taking notes on what residents are doing. For over a week, I sat in the corridors of two nursing homes, surrounded by my paperwork: sheets with blank tables to fill in the residents' actions and a stack of floor plans to mark the location of those actions.

One day, a resident walks past and greets me on her way to the living room. On her way back to her room, she asks me what I am doing. I explain that I am mapping out the activities that take place in the corridors. She nods in understanding. Later that day, she walks by again, looks at me with a smile, and says, "Ah, you're from statistics, right?"

Another time, I walked a few laps around the hallway with a resident. During my "sitting" observation, I had seen this resident several times looking out the window towards the living room, and I wondered why. Now that we were standing together in front of that window, the resident starts telling me what he was doing. "I always take a quick look inside to see who's sitting there, but no, I don't see anyone interesting right now. Let's walk a bit further."

My mind is filled with stories of events taking place in the corridors of the nursing home and the people who live there. These observations provide me with the data we need to conduct the study and answer our research questions. But it also means that I have come to care for these nursing home residents deeply, and that I want to create an even more beautiful living environment for them.

◁ *Images of the daily behaviour in nursing home corridors from Nursing home Zorg in Oktober (illustration: Leonie van Buuren).*

Whoever takes the lead in citizen initiatives in small communities, shapes the landscape of the village.

Livinglab Krake

KRAKE Living Community

Optimizing the future resilience of villages

The Livinglab

The effect of double ageing, depopulation and shrinkage are becoming increasingly apparent in the rural border region between the Netherlands and Germany. The identity and attractiveness of the villages, as well as the availability of amenities and services, are facing challenges. In order to support small towns and villages in sustainably enhancing liveability, the cross-border and multidisciplinary Strong Towns Project (KRAKE) was initiated in 2016 by HAN.

Research has been conducted in fifty-five Dutch and German villages in the Euregion Rhine-Waal to identify ways to enhance the liveability and future-proofing of these small towns. Given that the liveability challenges varied among the villages, six communities were established where practical research took place, each centered around specific themes such as healthcare, housing, and identity. One of these communities, the Housing Community, was led by the Architecture in Health

△ *Self-made pictures reflect the experiences and feelings of village residents regarding their living environment; Doornenburg, the Netherlands.*

◁ *Knowledge exchange between the participating Dutch and German villages during one of the village days of the Living Community; Winssen, the Netherlands*

lectureship and focused on addressing housing issues in smaller villages.

The objective

The research within the Living Community was conducted in collaboration with local initiative groups in eight Dutch and German pilot villages. We focussed on determining the most effective way to design the physical living environment of small villages to enhance the quality of life for its inhabitants.

The method

We began by identifying the needs of the villagers through a combination of methods. We conducted semi-structured group interviews, followed by creative workshops, photo voice exercises and a survey distributed to all households in the villages. Using the information gathered, we developed design recommendations to improve the connection between the residential environment and the needs of the villagers.

The outcome

The tight collaboration between researchers and representatives of the village in the Living Community resulted in the design recommendations from the study serving as the foundation for additional actions by initiative groups and involved municipalities. This led to the formation of working groups focused on specific aspects of liveability issues, such as providing suitable housing for seniors, greening the village centre, and improving traffic safety. The results were also taken into account in local policy-making in different municipalities. The insights from the needs assessment and the design recommendations were used, for example, during an election debate, to guide conversations between initiative groups and municipalities, and to update the housing vision in a municipality.

The results of the research and the experiences gained in the Dutch and German villages of the Living Community were translated into a handbook

for citizen initiatives in small towns and other stakeholders who are interested in improving the liveability in their own village or municipality. The handbook covers topics such as suitable housing concepts for older village inhabitants, combining the housing problem approach with other aspects of liveability in smarter ways, and stimulating meetings in the living environment.

Partners:

Rhine-Waal University of Applied Sciences:
Faculty of Communication & Environment
Village development Reek
Krachtig Winssen
Working group Doornenburg theme living
Working group Pleasant living, Wichmond
HAN: Architecture in Health

Duration:

January 2016 - June 2019

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For more information visit: www.deutschland-nederland.eu/nl/krake-regiostars-2019-2/

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Empathic Research Community

The Empathic Research Community consists of researchers involved in livinglab projects. The core of the community includes researchers from the Eindhoven University of Technology (Smart Architectural Technologies Chair) and HAN University of Applied Sciences (Architecture in Health Lectorate), with additional researchers from other knowledge institutions and fields of expertise. Besides conducting research together we share knowledge and engage in social activities.

◁ *Researchers from the Empathic Research Community at the Empathic Home.*

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www.deelacademy.nl/en/

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Environment Livinglabs