

# Mendel Broekhuijsen

## Design Projects | 2009 - 2020



# LEGO WeDo Light sensor



2009

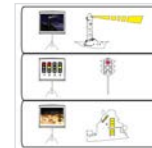
## What is the value of a light sensor for the educational WeDo robotics?

The goal was to prototype, test and explore the value of new sensor for an existing educational robotics LEGO Education set



### Understand current proposition

Expert brainstorms with colleagues



### Explore scenarios

Overview of educational opportunities using a light sensor



### Prototype

Physical prototype of the light sensor



### LEGO models

Create several sets to demonstrate the concept



### Icon design

Design icons in line with existing visual language

# You Are Your Music | Opus 4



2009

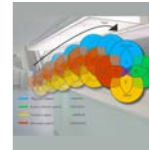
**How can the visitors of the Multimedia department of the Public Library of Amsterdam be motivated to learn something new in an enjoyable way?**

A mood-based exploring system for listening & browsing music in the library of Amsterdam.  
Signal-based recommendations enables the user to find new musical areas.



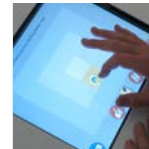
## Research

On-location needfinding, interviews and fly-on-the-wall observations



## Analysis & Conceptualisation

Applying learning theories on observed themes, to influence behaviour



## Software prototyping

Fully functional Flash application using Adobe Flash, ActionScript 3, HTML API's



## Hardware prototyping

Fully operational, stand-alone prototype • touchscreen  
• spray-painted wooden body



## User evaluation

Concept validation using in-context evaluation and exhibition feedback

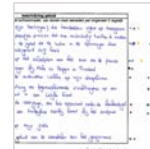
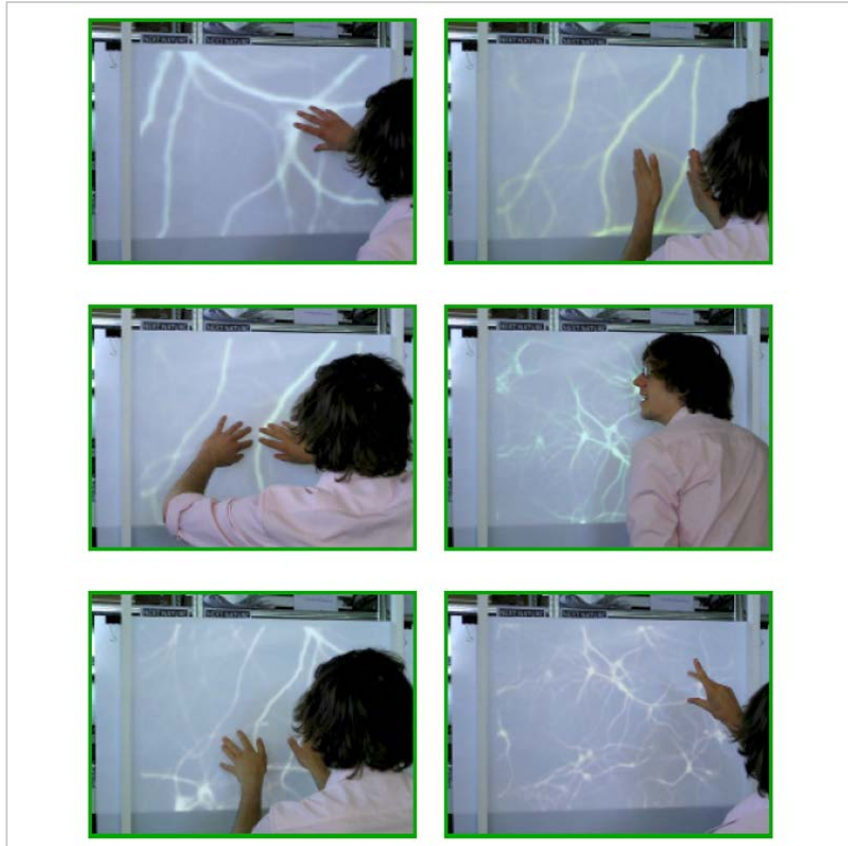
# Record of your Life | Opus 5



2010

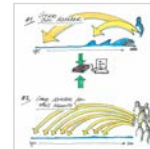
**How can we trigger the memories of routine events using auditory cues?**

A device captures sounds of routine events. At home an interactive installation displays an evolving visual representation, and plays a soundscape of your mundane activities



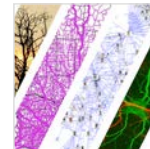
## Research

User inquiry about personal sounds • desktop research memories and sound • making recording of daily routines



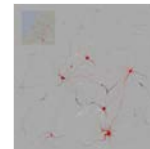
## Analysis

Scoring and clustering inquiry results • verifying findings with own recording experience • development of theoretical model



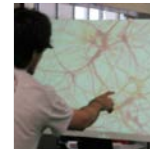
## Conceptualisation

Applying theoretical model on concept to visualise mundane recordings • development of capturing & visualisation device



## Prototyping

Wizard-of-Oz installation • Wii remote controlled Adobe Flash application • ActionScript 3 • projection screen



## User evaluation

Iterative interaction explorations • user confrontation during exhibition

# Designing for Diversity



2010

**The challenge was to design for diversity using ethnographic research methods in the context of the T+Huis, a community center in Eindhoven**

To avoid older kids to break away from the T+Huis, the concept-probes break this barrier and mixes up the groups, forcing them to cooperate and therefore find commonalities in every person participating in the activities



## Research

Iterative ethnography • invisible coffee cup video recordings • teacher interviews • desktop research cultural background



## Analysis

Combining input from 4 designers • systematic video scoring • defining in-group challenges (needfinding)



## Conceptualisation

Development of probes and concept to aid team creation, and rule out discrimination



## Prototyping

Verifying results within context using team-building probe (set of low-tech cards) • Proceeding with development final concept



## User acceptance

Iterate final concept (using video recordings for evaluation) • refining and implementing in daily activities of T+Huis



# Persuasion Experience

## Research about the long-term experience of a persuasive system

An application to persuade children of the “ iPod generation” to change the volume on their MP3 players to a healthy level, using persuasive audio messages, was developed and tested on the target users



### Design research

Developing concept to test theory of persuasion strategies • Involving Nationale Hoor Stichting to define target users



### Prototyping

Windows Mobile 6 application with Visual Studio • distribute on 10 Mobile phones • Involving writer for text, radio DJ for spoken messages



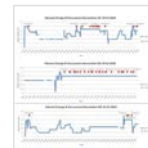
### User test preparation

Involving High-school for users • preparation informed consent & user guides • stress testing prototype in 2-week pre-test with 7 participants



### Long-term user testing

Involving 10 children from High-school • pre-test inquiring • testing 10 weeks • phones keep track of behaviour • monthly experience sampling via SMS



### Test analysis

Analysing quantitative data from phones • in-depth interviewing for qualitative feedback • analyse data for conclusions about persuasion experience

# Future Nostalgia | Opus 6

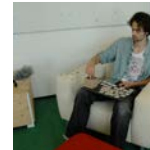
How can I bring back the richness and personality in digital music collections?

A digital platform for your own music history! This application enables you to capture, listen and share *memory-inducing music* with close friends, or reminisce individually.



## Research

*InspiResearch* for defining the boundaries & project vision • desktop research • describing person-object relations • creating project website & Facebook page



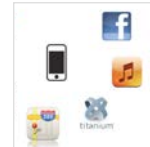
## Exploring

Involving social media for user input • *Co-exploration* in 10 x 45-minute sessions • scoring music-specific stories to match theory • involving external client



## Analysis & Conceptualisation

Formulating theoretical model of listening behaviour and collection types • creating concept to capture context identifiers in *Music-Specific Memories*



## Software prototype

iPhone app in javascript using the Titanium SDK • leveraging Facebook, maps and on-device music • developing UX/UI with client's graphical designer

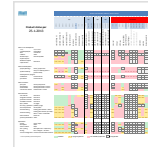


## Hardware prototype

Designing capacitive laser-cut token to extend two fingers to 9 touch points to unlock personal music • new technique based on existing screen technology

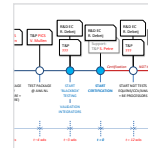
# Payment terminal software

Product management for all software related projects for digital payments



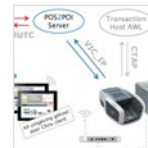
## Requirements & scope

Product owner for PIN software requirements • determine requirements • release management



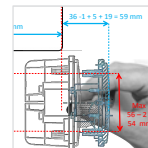
## Migration roadmap

Project management and roadmap for migration of NL and BE terminal software into one BENELUX version • risk assessment



## VAS concepts & architecture

Concepts for Value Added Services in terminal software • giftcards and loyalty card acceptance • payment via tablet/smartphone



## Anti-skimming solutions

Security investigation for 'skimming' • technical drawings and POC with municipalities and system integrators



## Webloader

UI design • product owner



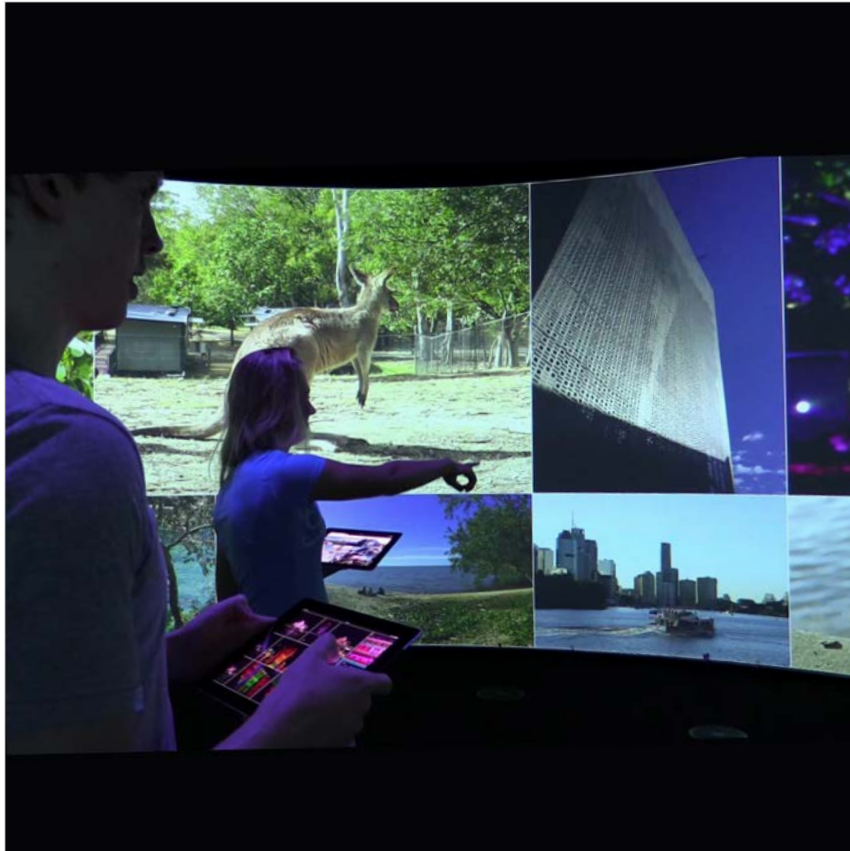
# Curation Arena

## On-demand curation of digital photos to support shared remembering

The goal of the Curation Arena prototype was to investigate how couples and friends use *curation-in-action* to share personal photos to support shared remembering.

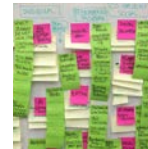


2015 / 2016



### Collaborative re-design

Facilitating brainstorm • Redesign exercise with 15 participants to identify challenges for collocated photo sharing



### Analysis

Prioritising challenges for collocated shared viewing • developing understanding of multi-user interaction and shared system use



### Concept development

Formulating requirements • positioning within prior work in HCI literature • iterative design process to develop concepts



### Prototyping

Full working prototype • Node.js web application for 360° screen + 2 iPads • interaction with Javascript, HTML, CSS



### User evaluation

Remote participant gathering • System deployment for 11 x 45-minute use by 22 participants in pairs of 2 • semi-structures pre- and post interviews

3rd & 4th year of joint PhD research

Supervisor: E. van den Hoven (UTS & TU/e) / Promotor: P. Markopoulos (TU/e & UTS)  
Client / Funding: NWO (Nederlandse Organisatie voor Wetenschappelijk Onderzoek)

# Qwiek.snooze

Qwiek®

2018 - 2020

## How can we help people with dementia to fall asleep?

The goal of this product is to help people with dementia fall asleep more relaxed by presenting them with relaxing music and sounds.



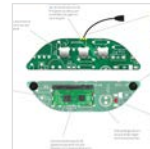
### Research

Extended research with health care professionals and music therapists • investigate customer pain points • present insights for stakeholders



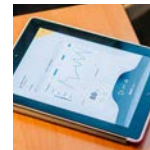
### Concept & prototyping

Design, prototype and test technological viability internal and external • pilot with 3 care homes • present to stakeholders



### Product development

Project manager for development process • product owner for hardware & software requirements • contact with suppliers for cables, PCB, fabrics, and music



### iPad app

Requirements tablet app • iPadOS app development with external company run • sleep analysis project with interns •



### User evaluation

Pilot and beta testing with 5 participating care homes • automated online evaluation • recommendations for the directors based on evaluations