

RESEARCH THROUGH DESIGN · SOUND  
FEMINIST HCI · VISUALIZATION · CULTURAL  
PROBES · CHATBOTS · INTERCULTURAL  
TANGIBLE INTERACTION · AUGMENTED  
REALITY · USER EXPERIENCE DESIGN  
WORKSHOPS · MANAGEMENT · SIMULATION  
SOFTWARE · MEDIA · GAME DEVELOPMENT  
DESIGN FICTION · SUSTAINABILITY · AI  
MUSIC · GAZE TRACKING · PARTICIPATORY  
DESIGN · USABILITY · SOMA DESIGN  
PERSUASIVE TECHNOLOGY · VIRTUAL  
REALITY · PERCEPTION · WEB · STREAMING  
DATA · VOICE ASSISTANTS · EVALUATION  
VIDEO PRODUCTION · GRAPHICS · LIGHTING  
INTERFACES · COMMUNICATION · CRAFTS  
DRONES · SHARING ECONOMY · AUDIO  
E-TEXTILES · MACHINE LEARNING · HCI

**MEDIA**

**TECHNOLOGY**

**MASTER THESIS PROJECTS**  
**2018-2019**

**KTH Royal Institute of Technology**

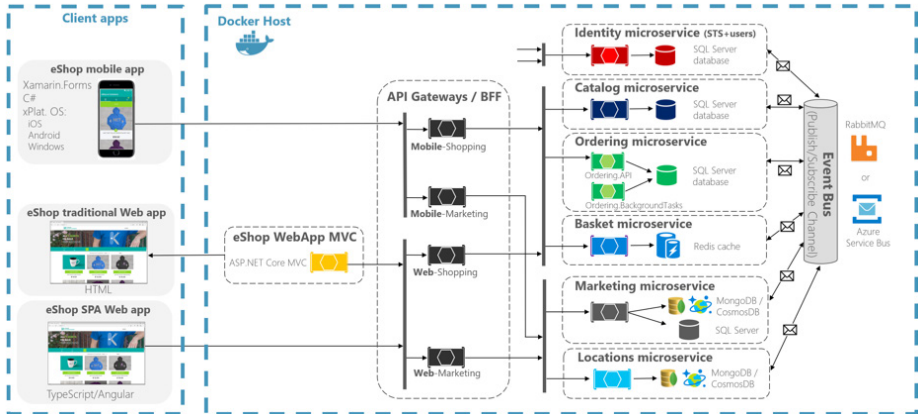




This catalog presents a collection of master thesis projects from students coursing Media Technology master's degrees at KTH, presented in 2019. Each student has voluntarily submitted a picture and a description of their work.

You will find projects from students in the master's in Interactive Media Technology, Media Management and EIT Digital (Human-Computer Interaction and Design).

Enjoy!



## Evaluating difference in performance between Monolithic and Microservices Architectures

Microservices have received a wide adoption in the industry among companies building large-scale applications like Amazon, Netflix, SoundCloud and LinkedIn. Even though microservices have emerged from the software industry and have been the focus of practitioners in the last decade, academic researchers have not kept with the pace.

In this paper, two systems were developed and deployed. Both systems provide the same set of functionality but were built using different system architectures: one as a microservice architecture and the other as a monolith. A set of performance tests were then executed on the systems using different workloads. The quantitative data for each system was analysed and compared on different quality attributes, such as response time and resource usage.

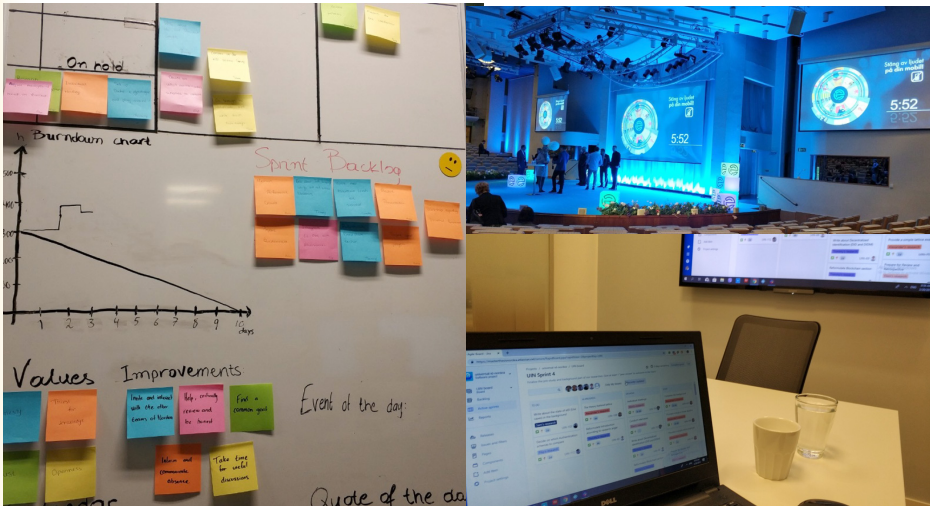


## Comparing the head- and eye direction and accuracy during smooth pursuit in an augmented reality environment

This thesis will examine the head- and eye direction and accuracy in an augmented reality environment when wearing a head-mounted display. This will be done with an augmented reality headset, Magic Leap, which allows for tracking both the user's head and eye direction. The aim is to better understand their interplay for possible utilization.

The participants in the user study will be given a task which encourages different types of head and eye motion combinations. The task is simple and all the participant has to do is following a moving object with their gaze. While doing this, data regarding both their head and eye directions, will be gathered by the prototype.

The thesis aims to answer the question *“When in an augmented reality setting, under what conditions is the head respectively the eye mainly used to detect moving objects?”*



## Agile Project Management Case Study: Adjusting Scrum for the needs of a student team in an industrial framework

Although agile practices have been broadly and successfully applied in industry, due to their developmental nature, they still ignite great interest for both academia and industry. Agile methodology is a common working standard today on which research has been extensively conducted. Universities are starting to teach agile methodology to prepare students how to work after academia. While current studies of applying Scrum exist, the following case has never been tried nor studied.

The purpose of this research is to explore the scrum framework, in what way it promotes the team performance and engagement. The intent is to clarify whether alternative practices could be implemented in the traditional Scrum method when it is applied in a team that hasn't previously exposed nor tried Scrum. Finally, the goal of this study is to point out these practices for the implementers of Scrum.

The main research question of this research is the following:

How does Scrum framework impacts the performance of a student team?

The following sub-questions are investigated:

What are the applicable practices promoting team performance and motivation in the context of a student scrum team?

What alternatives can be implemented in order to render Scrum more suitable for this specific context?

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## 社会化媒体对在瑞典的中国移民跨文化能力之影响调查

### Impact of social media on intercultural communication competence of Chinese immigrants in Sweden

感谢您参与刘明星(Mingxing LIU)的研究生毕业论文调查。

本次调查的目的是研究社会化媒体对在瑞典的中国移民(华人、华侨)的跨文化能力的影响。因为您是在瑞典生活的中国移民,所以您符合本次调查的要求及条件。

本次调查中涉及到2个概念:社会化媒体和跨文化能力。社会化媒体(social media,也可称作社交媒体)是人们彼此之间用来分享意见、见解、经验和观点的工具和平台;跨文化能力(Intercultural Communication Competence,简称ICC),被定义为一系列认知的、情感的和行为的技巧以达到与其他文化的人有效且恰当地沟通。

我对您的信息严格保密,此调查不包含可以甄别出来指向您的信息。调研成果仅用于学术研究。本次调查的语言为中文,受访者可用中文或英文进行回复。

本次调查大概用时20分钟,您可以一气呵成完成问卷,也可以按照您的时间自行安排。

## Impact of social media on intercultural communication competence of Chinese immigrants in Sweden

In this study I interview 15 Chinese immigrants living in Sweden. The research is qualitative research to draw the implications of Chinese immigrants' patterns of social media use, their endeavours to adapt to the Swedish culture and belongings to their native culture.

The hypotheses of this project are the assumptions that there are major shifts in their social media use, and the ICC (intercultural communication competence) of Chinese immigrants improves when residing in Sweden, and social media will impact ICC in a positive way. To achieve the objective result, the project is carried out carefully and does not miss any potential outcomes.

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## Curious Cycles: Cultivating curiosity of the body during the menstrual cycle.

Curious Cycles responds to the tensions that arise when designing technologies for menstruation and menstrual cycles, touching upon notions of intimacy, trust, taking or making space and our relationships with our bodies. The project follows a Research through Design approach, following Soma Design and feminist research methods.

Curious cycles are a set of cultural probes; objects and interactions designed to gather experiences and insights from five people who menstruate, throughout the duration of a cycle (approximately one month). The objects are meant to provoke reflections on the ways we currently relate to our bodies and bodily fluids and speculate on how we might relate to them in the future. The outcome of this project is presented as a set of generative design concepts and tensions that arise when designing for curiously attending to a stigmatized experience of the body.

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## **Psst, Wish Me Luck: Speculating Whispering as an Interaction Mode through Design Fiction**

This thesis explores the topics of implicit interaction, whispering as a voice modality and the interaction between humans and intelligent assistants through design fiction. It also proposes a series of design considerations for whispering as an interaction mode, the interactive engagement around it as well as facilitate understanding of the possible futures for voice assistants.

What intentions can we communicate through whispering and how would it affect our relationship with our future assistant? This thesis explores the questions of *How might we interact with a conversational user interface through whispering?*

With Research Through Design as a method of inquiry, the final outcome of the thesis presents a Design Fiction short story with a narrative property. This story speculates the different use cases of whispering as an interaction mode as well as a change in the relationship between the protagonist and her digital personal assistant.

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## **Mapping detected periodic dance movements to control tempo in the music playback of Electronic Dance Music**

Engaging in the music set of one's favorite artist or DJ is oftentimes leading to the result of a powerful and euphoric felt experience, a sensation partly also induced from dancing in beat to the music. In an attempt to simulate a similar dance experience, a user-study was designed in order to investigate when a user is let to dance in rhythm to a music playback and in addition, in control of a music playback tempo through the induced dance movements. A proof-of-concept prototype was built and tested in an initial study, followed by a main study where the prototype had been modified and 12 participants participated. A questionnaire was given containing various question statements to be rated through a Likert-scale regarding their subjective experience. Open-ended questions were also included to collect their own opinions. From the results, an enhanced engagement and enjoyment of the music could be identified when being able to manipulate the tempo.

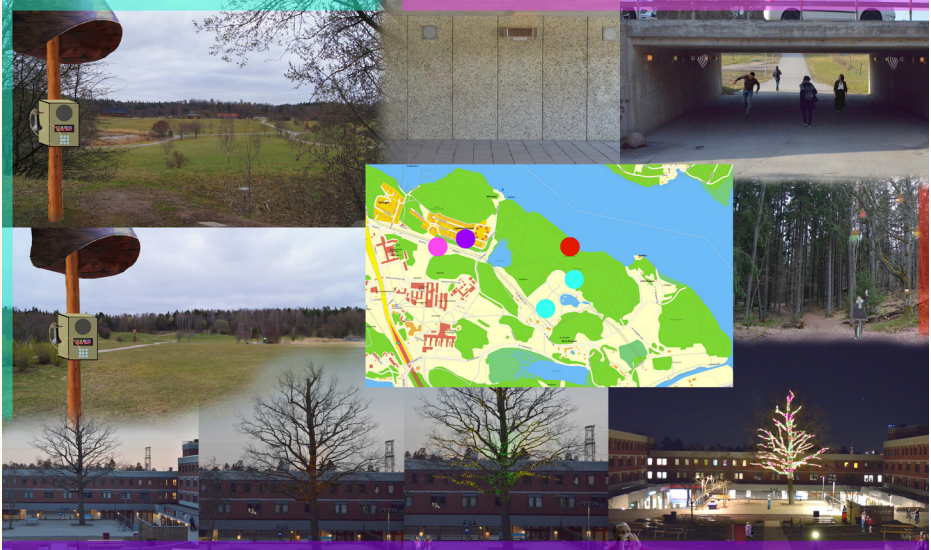


## **Eavesdropper: Exploring Design Strategies for Exploration and Interpretation in Multilinear, Mixed Reality Audio Drama**

Like reading, stories told or acted out auditory invites the listener to subjectively co-construct the events through imagination. While an interesting characteristic, audio-based, fictive storytelling is not well explored in HCI. Eavesdropper is a prototype system for listening to Mixed Reality Audio Drama, the stage being a miniature house and the actors residing in a spatialized, virtual, audio world. This work accounts for development and discussion on viability of some, contextually unconventional, properties of a current iteration: sections of the narrative unfolding in parallel, controlled by input the user performs without being aware of. The goal is to make the world life-like while allowing exploratory, highly subjective experiences. Through evaluation with users, I report on how Eavesdropper was experienced, explored and interpreted. The findings, a mixed bag, are then analysed and synthesized to a set of design sensitivities meant to inform and inspire further work on similar systems.

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## Fostering Community of Place: Exploratory Research through Playful, Serendipitous and Open-ended Design

In this work, I address challenges of social isolation and alienation from one's place of dwelling. Light is shed on a design space of sites of encounter by an explorative research through design approach. These sites of encounter are intended to foster opportunities for humans to interact with each other, share experiences, play, practice care, and to develop kinship. This is part of a practice of placemaking - of finding oneself better at home. Throughout the design process, four design instances (Phonehat - turquoise, Screamtrees - purple, Tunnelbeat - pink, Treebells - red) were created drawing from first-person perspectives, and reflected upon through a participatory workshop of bodystorming. The design process was situated in the neighbourhood I have lived in for six years, and the participants were a diverse group of seven residents from this neighbourhood. From a loosely applied thematic analysis, the main contributions are found within potentials and consideration for this design space; potentials for said intention; considerations for encompassing respect for frequently marginalized groups in the public space. These contributions are yet to be articulated.

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**By visual artist Nunzio Paci**



**Juniper - a cultural probe**

### **Using plants for power: a non-anthropocentric approach in envisioning the future of a symbiotic human-nature-technology relationship**

With technology as a new agent in the current multi species kinship, I am focusing on exploring the future of a symbiotic human-nature-technology partnership, specifically the florae part of nature. Rather than completely excluding humans out of the equation or considering technology as an evil agent, my emphasis is on combining all three components, as they are an integral and invaluable part of the ecosystem and they should be considered as such. I am concerned with understanding how is it different to care for something other than human, the trouble with caring and transforming multispecies relationships into matters of care rather than matters of concern, methodologies in decentering the human from design to break the boundaries of the body in order to understand how to design for more than human relationships. By following a Research Through Design approach, I am questioning human-centered methodologies through two activities: a cultural probe which pragmatically addresses notions of collaboration between humans and their ecosystem by fostering care, and an orienting activity that focuses on conceptually questioning what it means to be human and breaking the boundaries of the human body.



## Mixed Reality Museum Exhibit

### Statistical Analysis and Evaluation of the 6DOF-utilization of a Handheld Augmented Reality Museum Application

This study explored the relatively new field of public mobile handheld AR and how the touchscreen-based input of smartphones affects the way users aged 10-12 interact with the 6DOF (6 degrees of freedom) that AR provides. Two experiments were performed, one in a public museum setting and one in a private school setting. A statistical analysis was performed between non-restricted and restricted touchscreen-based input. Quantitative and qualitative data was gathered through semi structured interviews and non-participant observations. Results show no statistical significance between the physical distance moved of the smartphone and the restriction of touchscreen-based input. Qualitative data show a different software application may yield different results.

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## **Dancing With Drones: Crafting Novel Artistic Expressions Through Intercorporeality**

Movement-based interactions are gaining traction, requiring a better understanding of how such expressions are shaped by designers. Through an analysis of an artistic process aimed to deliver a commissioned opera where custom-built drones are performing on stage alongside human performers, we observed the importance of achieving an intercorporeal understanding to shape body-based emotional expressivity. Our analysis reveals how the choreographer moves herself to: (1) imitate and feel the affordances and expressivity of the drones' 'otherness' through her own bodily experience; (2) communicate to the engineer of the team how she wants to alter the drones' behaviors to be more expressive; (3) enact and interactively alter her choreography. Through months of intense development and creative work, such an intercorporeal understanding was achieved by carefully crafting the drones' behaviors, but also by the choreographer adjusting her own somatics and expressions. The choreography arose as a result of the expressivity they enabled together.

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**Supervisor:** Kristina Höök

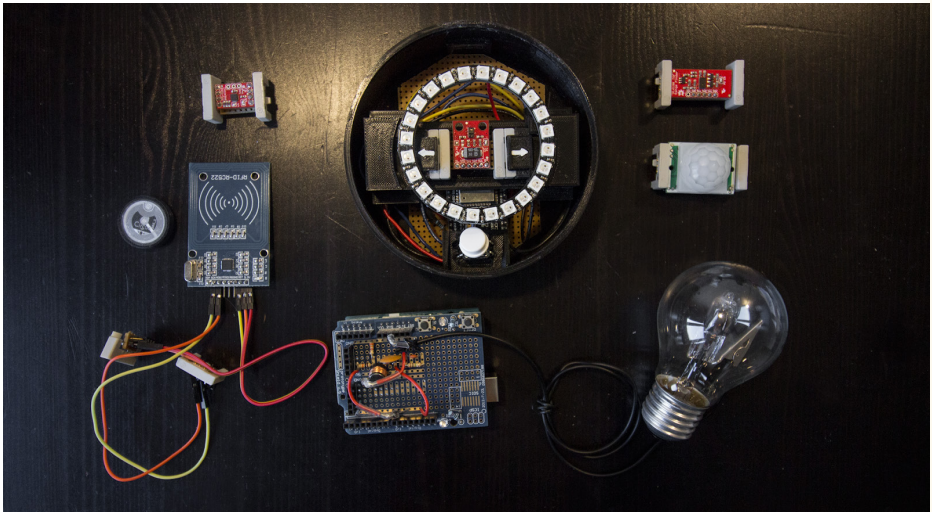
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## Variety versus Recurrence of Advertisement in Cross Reality Experiences

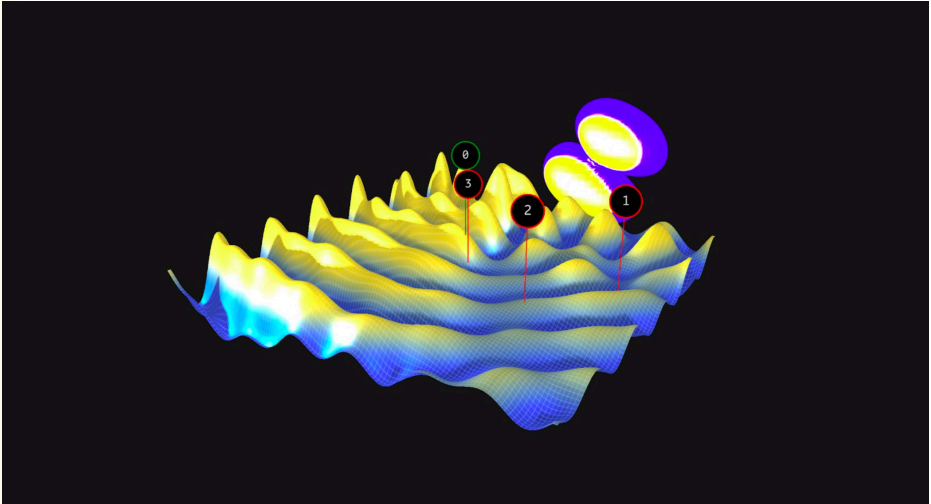
Advertisement is funding a lot of the digital landscape we interact with on a day-to-day basis. As our digital landscape evolve and the field of Cross Reality is maturing, it is of value to examine its compatibility with this mean of monetization. With the perspective of three major stakeholders in mind (advertisers, developers and end-users) this study examines the impact of two different sets of advertisements, one set from a variety of brands and one set from a single brand, in a Virtual Reality experience. A user study is conducted with data being collected through a questionnaire-supported interview as well as the advertisement software within the virtual experience. The results show very little impact on the user experience in general, however the data suggests a significant advantage for a variety of advertisement in terms of subconsciously reaching the user.





## Exploring affordances of tangible user interfaces for interactive lighting

This paper explores interaction with lighting through a tangible user interface (TUI). In a TUI the physical object and space around it are part of the interface. A subset of tangible interaction called spatial interaction is the main focus of this paper. Spatial interaction refers to translation, rotation or location of objects or people within a space. The aim of this paper is to explore the relation between spatial inputs and lighting outputs based on different design properties. A user test is set up to explore the effect that design properties of a TUI have on the lighting output that participants map to spatial inputs. The results of the conducted user test indicate that communicating affordances to the user is an important factor when designing couplings between spatial inputs and lighting outputs. The results further show that the shape of the interface plays a central role in communicating those affordances and that the overlap of input and output space of the interface improves the clarity of the coupling.



## Interactive visualization of radio-wave propagation in 5G massive MIMO

Exponential growth of mobile market and increasing user expectations towards quality of service led to an emergence of fifth generation of cellular networks (5G). Higher bandwidth, lower latency and enhanced user coverage generate number of technical problems that need to be solved to make wider adoption of the technology possible. Introduction of such technically-advanced solutions bears many difficulties in communicating its capabilities to a larger audience. Therefore, there is a growing need of ways to introduce the topic to people with limited background in the field while capturing their interest and evoking positive feelings. The aim of the project is to investigate application of information visualization techniques in presenting Massive MIMO technology to technical and non-technical users. The goal of this use-case study was to design, implement and evaluate a design artifact through participatory design. Feedback from potential users in a form of qualitative and quantitative data was gathered through standard usability methods as well as semi-structured interviews. Due to its exploratory nature, the research was conducted in a iterative cycle of design, implementation and testing with researchers and engineers at Ericsson AB, Stockholm.



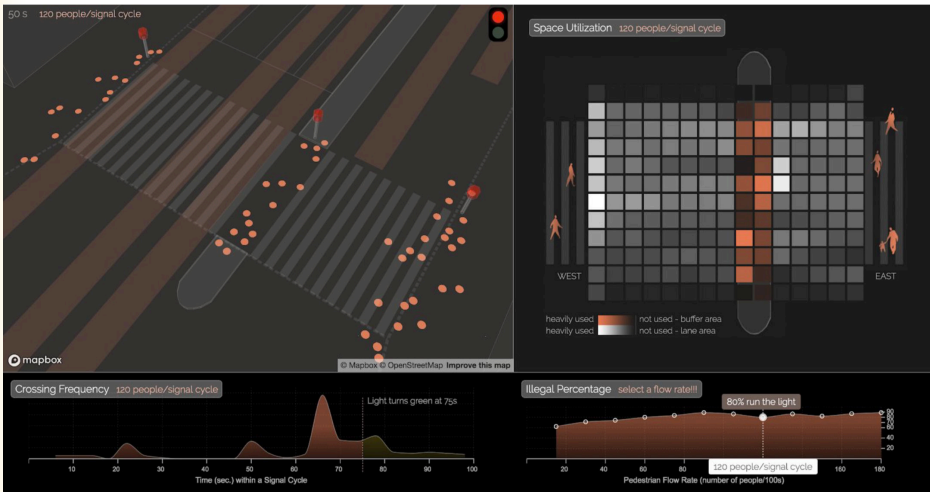
## **Cross-functional Collaboration Between Teams in Game Development: A Case Study**

Due to the complex nature of game development and the lack of studies made on its different cross-functional teams, a gap in understanding of these processes and communication practices have emerged. Problems with this gap in understanding include potential misunderstandings between teams which can cause further misconceptions and a lack of trust for Games User Research. The aim of this thesis project is to closely investigate the processes and communication practices of a User Research team in a game development process. In order to fill this gap in understanding which in turn can lead to more efficient communication between User Research and Development teams in the industry.

The project work will include conducting interviews with experts in the field, investigating and formally describing the different processes and practices, identifying important variables and finding important connections among them and thoroughly document results. A majority of this project work will be conducted, in the form of a case study, at the game company Paradox Interactive.

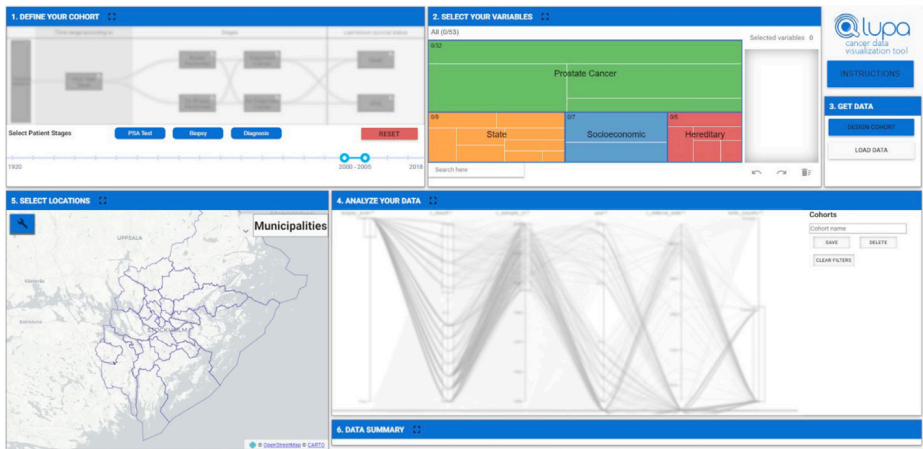
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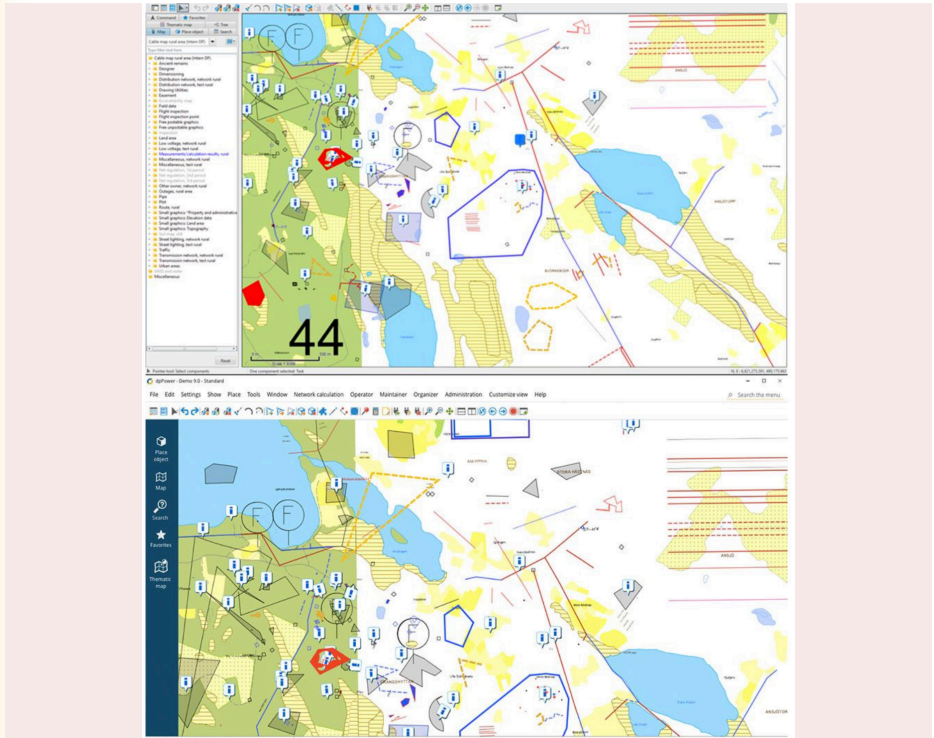
## Interactive Visual Analytics for Agent-Based Simulation: Pedestrian Behavior at Signalized Pedestrian Crossing

An Atkins team based in Stockholm is working on a software prototype called Planning Information Modeling (PIM). PIM is a parametric 3D visualization tool for urban planners, which helps with their cooperation and decision-making. To investigate one of PIM's future possibilities, this thesis aims at developing a visual analytics tool that provides insights into pedestrians' street crossing behavior. In the visualization scenario, people cross the street where there are traffic signal lights. Concretely, they go upon the crosswalk lines to reach the opposite side of the street. On the one hand, the visualization involves illegal crossing phenomena if people cross against the red signal light; on the other hand, it visualizes the space utilization of the crosswalk area by analyzing people's trajectories. Optimal Reciprocal Collision Avoidance (ORCA) is chosen as the crowd simulation algorithm to generate the trajectory data, which data is then used for developing the web-based visualization within one signal light cycle. Moreover, the tool enables dynamic comparison by providing users with the option to alter the pedestrian flow rate.



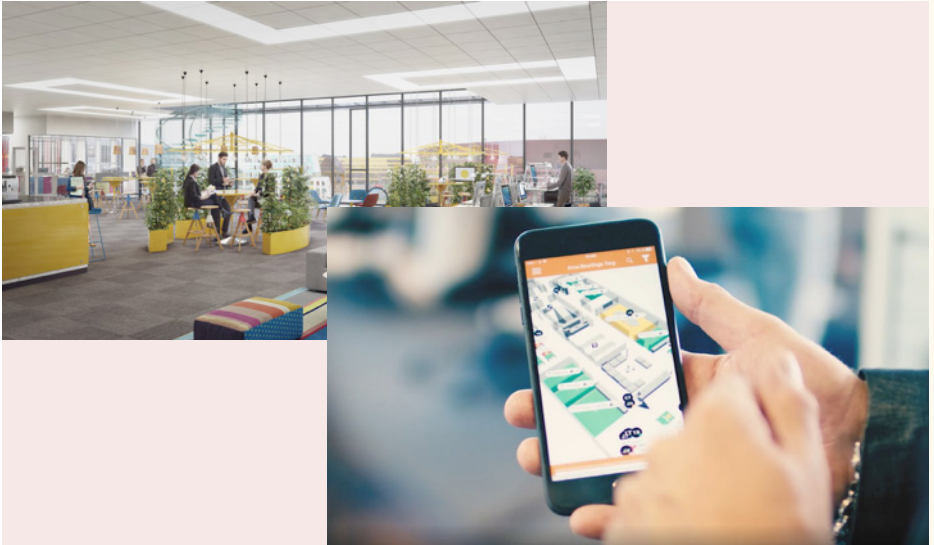
## Usability evaluation of a visualization system for urologists: Lupa

Swedish urologists, researchers and statisticians work with a centralized database in Stockholm containing more than two million prostate cancer patient records over 400 variables. To get a subset of data to analyze, they need to go through a process of data cleaning and query writing, which can take up to several months. In order to expedite the process, an interactive visualization system has been developed through the collaboration of KI, Janssen and KTH. Through a user study measuring the effectiveness, efficiency and satisfaction of the system, its usability has been evaluated as easy to learn and understand.



## Reducing the perception of complexity in GIS software

Nowadays many applications have complex graphical interfaces presenting an overwhelming amount of functions to users, with menus offering long lists of options and toolbars with a lot of ambiguous icons. This is, in particular, the case for companies who add more and more features as a way of improving the product and make it more attractive in the marketplace. This has, of course, negative effects on both users and the companies selling such software and results in the software being considered complicated and hard to use. This paper studies what can be done to decrease the perception of complexity in such applications, by taking the concrete example of a GIS software (dpPower) developed by the company Digpro. The method of this paper is Research through Design. The final result is a hi-fi prototype, proposing a new interface for the programme as well as an analysis of the main ways in which one can reduce perceived complexity.



## Research and Design of Office Desk Management Solutions in Flexible Seating Workplace

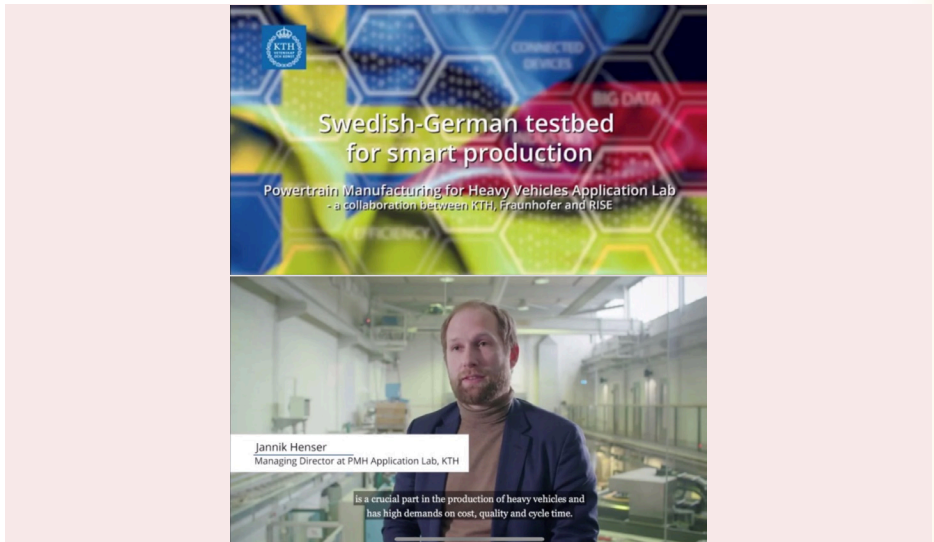
This Master's Thesis will be done in Flowscape AB which is a Swedish company doing business in the field of Smart Office System. In many smart office use cases, there are many flexible office desks used in the office area, which means that employee doesn't have a fixed office desk for working. Customers (Companies) and users (Employees) need to know how to manage the flexible office desk. For example, users should know how to identify if the desk is free or not by mobile app or some physical indications based on sensor data. In this thesis, the goals are to understand the needs for flexible office desk from customers (Companies) and users (Employees), and to generate possible interaction design solutions for office desk management solutions in flexible seating scenario.

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## Research video production management: Best workflow and case examples

It is observed that researchers and research centers are experiencing difficulties in dissemination in the digital era. However, digital marketing is currently vital and essential for research activities and even as requirements for EU project evaluation. Thus, this project aims to explore how to disseminate research by using digital video production. The focus of the project is the video production project management, in particular the workflow, with providing an overview and analysis of professional management methods and workflows for research video production. Then a new management model with workflow is proposed, and applied in the HMI and ReCiPSS case study with evaluation.

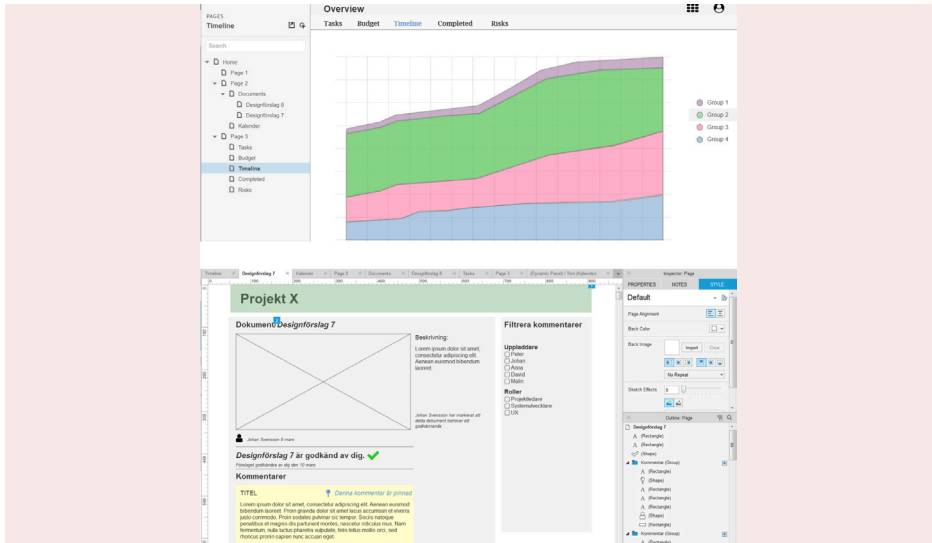
\*The HMI case study is making a video production on “Swedish-German testbed for smart production” for PMH Application Lab at Hannover Messe 2019. The ReCiPSS case is making a short animation video production for the European project introduction and dissemination.



## Behind the Chatbot: Investigate the Design Process of Commercial Conversational Interfaces

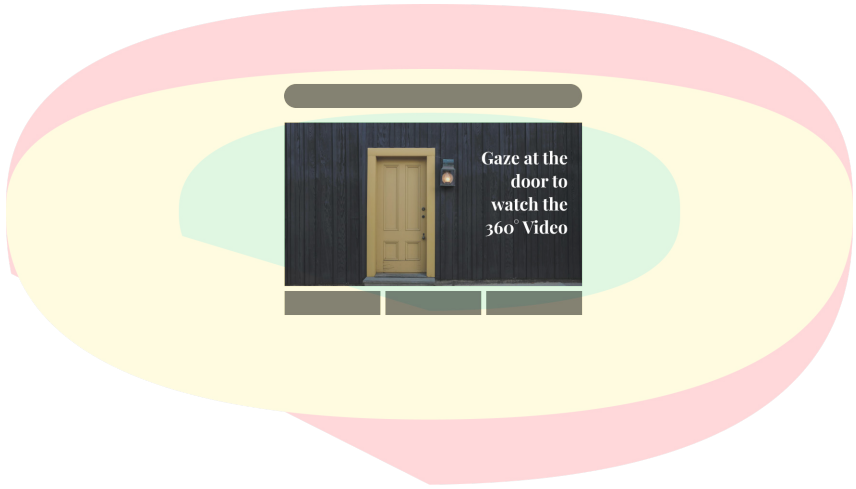
Chatbots have been pushed forward by big tech-players in the past decades. Investment in this field is growing fast, as well as the number of users and applications available. There are more and more products or platform trying to involve chatbot in their iteration, chasing the direction of a more socially-connected world.

Conversational interfaces are one of many interaction modalities, in which interaction design plays an important part. But people have special expectations to the "Chatbot" comparing to interfaces of other modalities. This thesis project aims to investigate the design process current workflows and practices of the team members in a commercial conversational Chatbot project, including product manager, developer, designer, and CRM manager. Articulate current challenges and problems occurred in the design process, along with suggestions and possibilities for improving the workflow.



## Visualizing the project process from the perspective of a client

In the ever changing, and constantly developing digital age, it is important for companies and businesses to adapt to the current digital climate and develop alongside it. One such thing would be to have a digital platform in which communication between companies and clients can take place. This is especially important when the communication is centred around a project. Thus, the research question that this paper will explore is as follows: How do you visualize and present information regarding the process and progress of a project to a client in a user friendly and interactive manner? In order to answer this question, a user-centered design approach was utilized. Six clients of different projects were interviewed. The results and analysis of the interviews rendered in a foundation on which a prototype could be built. The design of prototype was subsequently improved upon through user tests with the aforementioned clients.



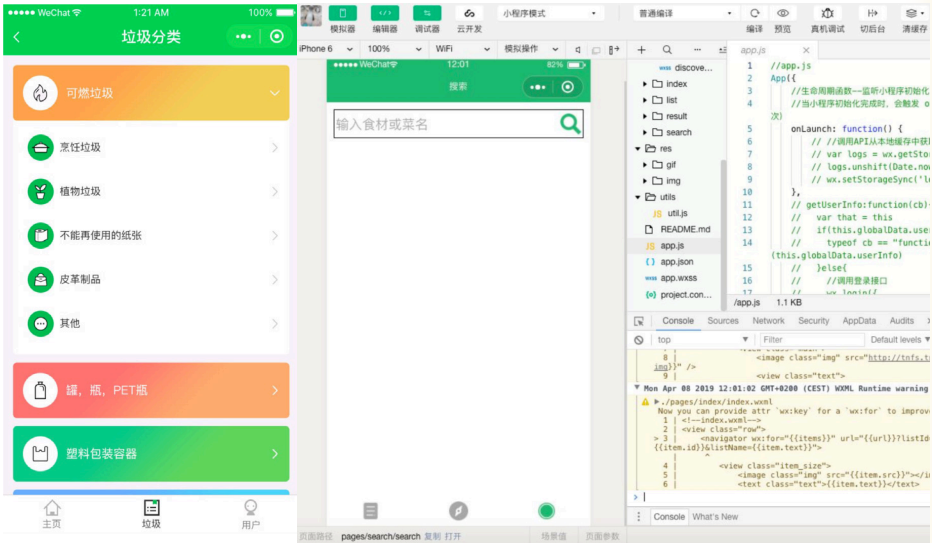
## **Impact of Innovative Interaction Approaches on Trust between Tenants and Landlords in Sharing Rental Economy**

According to [studyinsweden.se](http://studyinsweden.se), students have a hard time seeking accommodation in big cities like Stockholm in Sweden. The tenants and landlords employ video or voice call platforms for the meeting. But are online meetings enough? Trust can be defined as a property of relations between two or more social entities. Trust was used a factor to build a grounded theory for the study. This study answers, “What is the impact of innovative interaction techniques like VR 360° video tour on trustworthiness among tenants and landlords leading to the intention to rent a home?”

Initial user research interviews were conducted with five students and analysed to formulate content for the 360° video. One landlord was asked to participate in the filming workshop. The landlord introduced themselves, their expectations and gave short tour of the property. The 360° video was tested as a Mobile VR prototype with five students. They were asked to fill in a questionnaire and interviewed on their experience after the study. The results were analysed qualitatively to observe if using 360° video formats could give rise to favorable renting patterns among the students in relation to senior landlords.

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## Applying persuasive technology in garbage classification on Wechat platform

Garbage recycling is an important measure for protecting environment and saving resources. However, current garbage recycling is not efficient and effective because most people don't have accurate knowledge about how to correctly classify these resources, especially in the developing countries. This project aims to develop a program based on Wechat to strengthen knowledge about garbage classification by applying persuasive technology. Experiment subjects are Chinese people, and the research question of the project is: Can persuasive technology be an effective method in helping Chinese people learn knowledge about garbage classification and cultivated a habit of classifying garbage correctly?

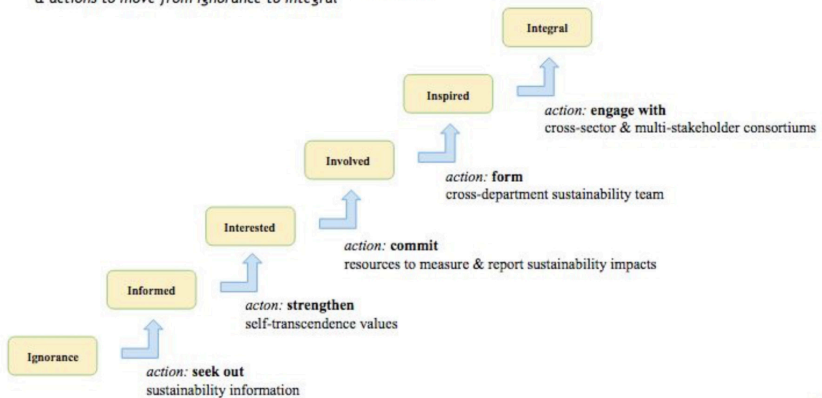


## How In-house Usability Testing Increases Product Development Usability Testing - In-House vs Externally

Can product development process be improved by moving usability testing in-house? The interest in this question lies in the agile transformation which the company initiated in 2016. Once agile, the company's interests are efficiency and increasing quality. One way of increasing quality of their digital products is to improve the process behind it, where involving users in usability testing is central in an agile and iterative design process. The culture of usability testing, collected via a survey, and the current process was investigated to identify potential flaws in said process. The best practice conclusions are supported with literature and two usability tests, one external and one internal test. Parameters between the two tests were compared and weight against each other to conclude which process was better. The main findings are that the internal process shows most promising characteristics. It is  $\frac{1}{4}$  as expensive, has a quicker call-to-test time, and allows refinement of the process itself. With the main findings in hand, the conclusion points to the fact that usability testing should be produced and conducted by the company.

## Six Stages of Sustainability Transformation

*& actions to move from Ignorance to Integral*



## Sustainability Transformation - Mitigating Negative Impacts & Accelerating Positive Impacts on Biodiversity Integrity: Incumbent Nordic Media & ICT Companies

The objective of this study is to focus on solutions and provide an overarching roadmap for understanding, measuring, implementing and reporting sustainability transformation, and in particular impacts on biodiversity integrity. The scope of the study is incumbent media and ICT digitalisation companies within the nordics, due to their potential as catalysts for sustainability transformation. The methodology is a review of academic research, interviews with organisations leading the discourse around biodiversity integrity and digitalisation, and an analysis of incumbent nordic media companies' stage within the sustainability transformation process. Some of the motivations behind the study are the WWF's 2018 Living Planet Report, Steffen et al.'s 2015 Planetary Boundaries, the UN's 2015 Sustainable Development Goals, and the UN CBD's post-2020 biodiversity framework.

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## **Differences in method to determine credibility of news between Ethiopian and Swedish students**

Due to recent media reforms and the increasing prevalence of social media, Ethiopians have access to a larger number of news sources than ever before. The sudden increase in the number of narratives and the unreliability of anonymous sources on social media will make it harder than ever for people to make sense of the world. In order to maintain national unity and economic stability, it will be necessary for the youth of Ethiopia to increase their media literacy. But will media literacy education efforts in Ethiopia have the same effect as in other countries? To answer this question, ten students from Ethiopia and ten from Sweden were recruited. First, they were interviewed about which attributes of a story that has been shared on Facebook (such as sharing friend, author, and so on) they think is the most important indicator of the story's credibility. Then they played Reality Check, a game by Canada's center for digital and media literacy, which introduces a diverse set of tools to verify the credibility of news stories on Facebook. Lastly, they were again interviewed about how to rate a story's credibility, in order to find out whether Reality Check was received differently between the groups. Any clear sign that the differences in answers are greater between the groups than between individuals in the groups will indicate that media literacy cannot be taught in the same way in Ethiopia as in Sweden and that education efforts must adapt to local conditions.

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## Intermediaries in the ecosystem of social entrepreneurship

Public bodies

Academic institutions

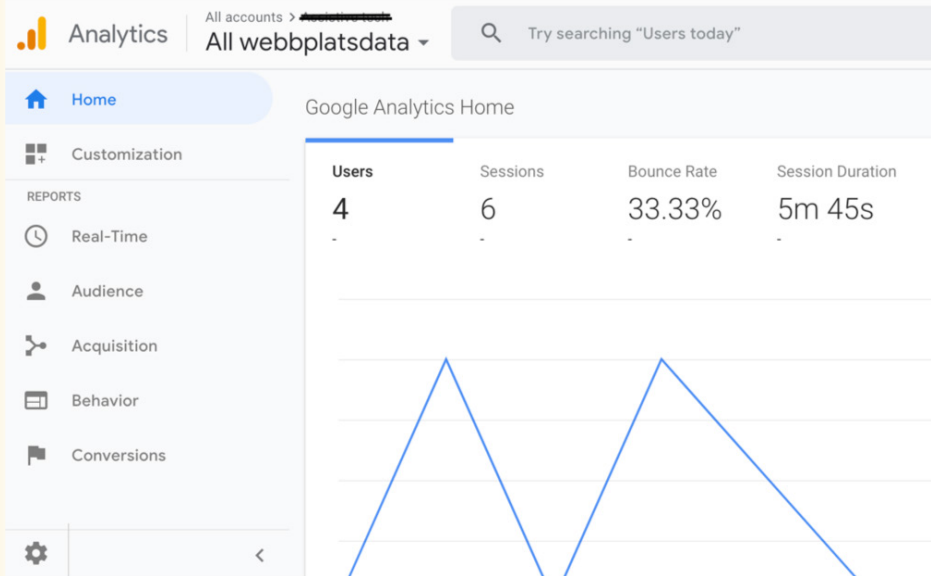
Support organizations

### **Supportive Measures for Scaling Swedish Social Enterprises Abroad: Intermediaries' Perception of Initiatives Needed**

The research aims at answering the following question: Does stakeholders in the ecosystem perceive that there is a need for initiatives supporting social companies' internationalization and if so – how should these supportive measures be designed to provide maximum value for the companies looking to scale globally? A mapping of stakeholders was carried out to identify intermediaries in the ecosystem. Three different intermediary groups emerged from the mapping:

- Public bodies
- Academic institutions
- Support organizations including incubators, accelerators and investment firms

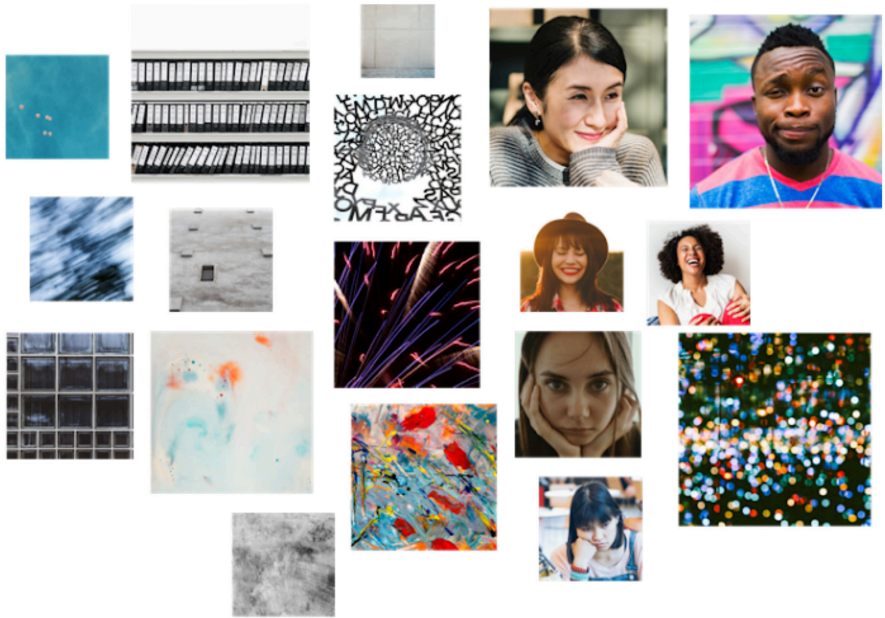
The study employs an exploratory research approach as it aims to create greater understanding for a phenomenon and providing insights into an area lacking a clear definition. Qualitative primary data was gathered through semi-structured interviews with stakeholders representing the institutions, with the aim of collecting data difficult to access using other methods, building upon intrinsic industry expertise and empirical knowledge which the interviewees possess.



## Data driven marketing - how to gain relevant insights through Google Analytics

In this report, problems regarding the retrieving, measuring and analysis of data in the web analytics tool Google Analytics will be discussed. The relevance of a correct setup, configuration, campaign tracking and understanding of data models in Google Analytics is essential to be able to achieve relevant insights. This is important since many Swedish companies experience issues related to their setup of Google Analytics as well the ongoing maintenance of the data to be measured and analysed. A literature study has been conducted to gather information, focusing on collecting theory from researchers and experts in the field of web analytics. Google Analytics data and reports from several Swedish companies has been studied to gain a deeper understanding of how the tool is being used. Interviews with marketing department employees has been conducted and analysed in a qualitative manner, which has been the basis for the result.

The research question is: How should a correct setup and maintenance of Google Analytics be done at a Swedish marketing department in order to retrieve the correct data needed for an efficient analysis of the marketing effects?



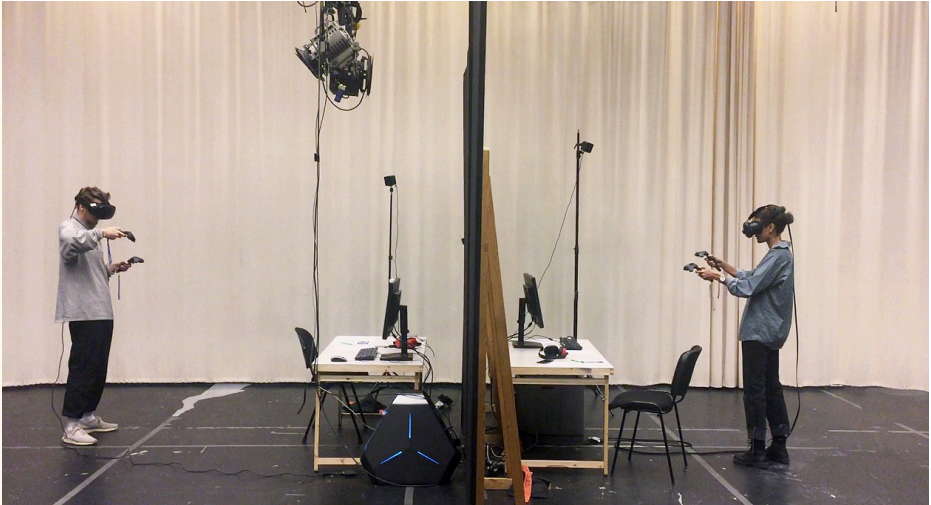
## OakMood: A Visual Evaluation Method for Emotional Aspects of User Experience

The aim of this thesis is to investigate how images can be used to provide emotional feedback on user experience. The report describes the iterative process of developing OakMood, an image-based design evaluation method that provides designers with user generated visual feedback. OakMood enables users to provide emotional feedback

on web user experience by choosing images that correspond to their experience of an interaction. The images have been rated by an online crowd according to nine emotions, hence providing emotive characteristics for each image. Results are subsequently presented as mood boards and charts to designers and stakeholders. In addition to providing emotional user feedback on design, OakMood aspires to reflect branding elements of a website. Findings in this study indicate that image-based user feedback can provide valuable insights in the design process. Furthermore, results also indicate that users find images to be an engaging and useful methodology to assess emotional response to user experience.

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## A Collaborative Previsualization Tool for Filmmaking in Virtual Reality

Previsualization is a collaborative process of planning scenes and shots within pre-production stages of filmmaking. By providing more details from 3D animation tools and software for modelling entire scenes, previsualization has become a tool that filmmakers can use for planning and validation. In this thesis, a novel interface for previsualization in virtual reality (VR) is presented. Previsualization is collaborative process where people with different expertise can experiment, discuss and validate different parts of a film scene - a process that is traditionally performed with drawings, concept images, sketches, etc.

The ability to work remotely in different geographical locations is increasing and with the advent of extended reality tools, collaboration in remote places can be achieved to a higher extent. By developing a multi-user, collaborative tool for previsualization in virtual reality, the hope of this project is to provide guidelines for how to best design interactive, collaborative interfaces in VR.

After conducting experiments on 20 professional filmmakers, the results presented in the thesis show that the collaborative VR experience would be significantly useful for a real-life scenario in pre-production for filmmakers. Furthermore, analysis of the interface design highlights further development that can enhance this experience even further.



## Success factors in grocery online shopping

In this research the differences and consensus between the consumers and the actors perception of the crucial success factors within Swedish online grocery shopping are being analyzed.

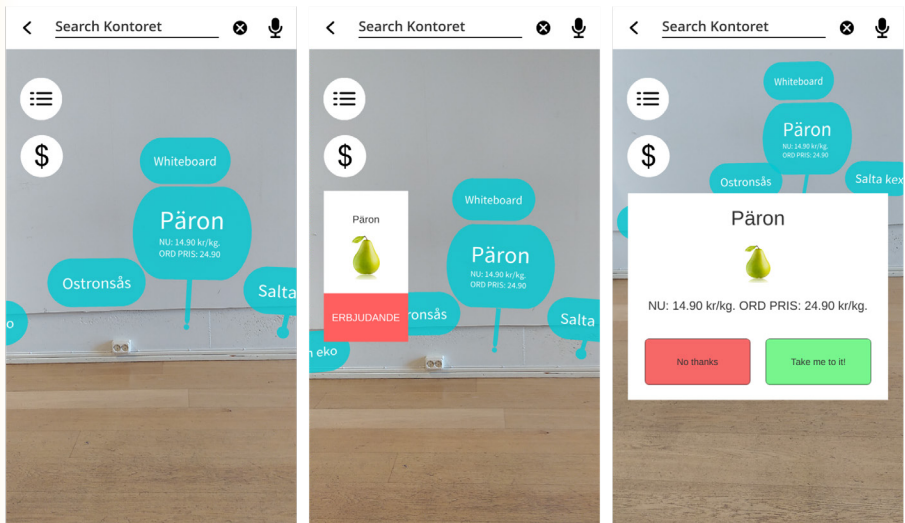
Online grocery shopping is one of the fastest growing markets in Sweden. The online grocery shopping market encompasses both pure digital players and major hybrid actors with a combination of online and offline sales.

The main result in this report show that consumers and actors agree on some of the main issues even though the actors seems to overrate the importance of making the webpages personalized with each customers favorites. At the same time they seems to underrate the importance of keeping the price at the same level as physical stores and the importance of favorable membership. There is consensus on the importance of an easy-to-use webpage and home delivery being the crucial form of delivery.

It is of greatest importance that the actors develop strategies that make them relevant and attractive to consumers, competitive in the market and also profitable. The market is in a very interesting phase right now, experiencing high growth and there is a lot of potential for successful actors. Big strategic decisions and large investments are being made, but as this research suggest not always on things that really could make a difference for the consumers and could make them loyal to one actor and give that actor a greater part of their spend.

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## Establishing Optimal Visual Cues For Presenting Offers While Using AR Navigation In A Retail Environment

Ever since the term Augmented Reality was first coined back in 1968, research on the subject would for decades remain largely focused on technical aspects of the phenomenon. Some modern studies have touched upon user satisfaction of general AR interfaces, but most studies that cover indoor navigation with AR tend to focus on technical solutions. Few try to establish any kind of visual language or research what interaction cues are most intuitive, effective and user friendly. This thesis will thus focus on how to visually seek the attention of the user to present offers and discounts in an Augmented Reality application meant to be used to navigate an indoor retail environment.

How should discounted products present themselves or otherwise seek the attention of the user? What level of intrusiveness is appropriate as to make users aware of the offers around them, but not distract or irritate the user during his or her shopping experience? These deliberations will be answered in this study as it attempts to establish conventions for how to digitally present offers to customers while using an AR application to navigate a retail store. Consequently, the research question is as follows: How can one effectively balance visual intrusiveness with awareness of offers when presenting discounts to users of an Augmented Reality application in a retail environment?



## Imagining Future Technology of the Horse Industry and Equestrian Sports

Equestrian sports are amongst the largest sports and leisure activities in Sweden and one of the major reasons for horse riding is the bond to the horse. Just recently technology has found its way into the horse industry which otherwise is a very traditional sport. This paper explores possible consequences technology may have in the environment around horses and on the horse-rider relationship.

The exploration was done by combining auto-ethnographic research and a co-speculation workshop. The ideas that were gathered were then the starting point for the creation of a design fiction. The imagined technology for equestrian sports had both positive and negative impact on the sport and the relationship between horse and human.

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RESEARCH THROUGH DESIGN · SOUND  
FEMINIST HCI · VISUALIZATION · CULTURAL  
PROBES · CHATBOTS · INTERCULTURAL  
TANGIBLE INTERACTION · AUGMENTED  
REALITY · USER EXPERIENCE DESIGN  
WORKSHOPS · MANAGEMENT · SIMULATION  
SOFTWARE · MEDIA · GAME DEVELOPMENT  
DESIGN FICTION · SUSTAINABILITY · AI  
MUSIC · GAZE TRACKING · PARTICIPATORY  
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