

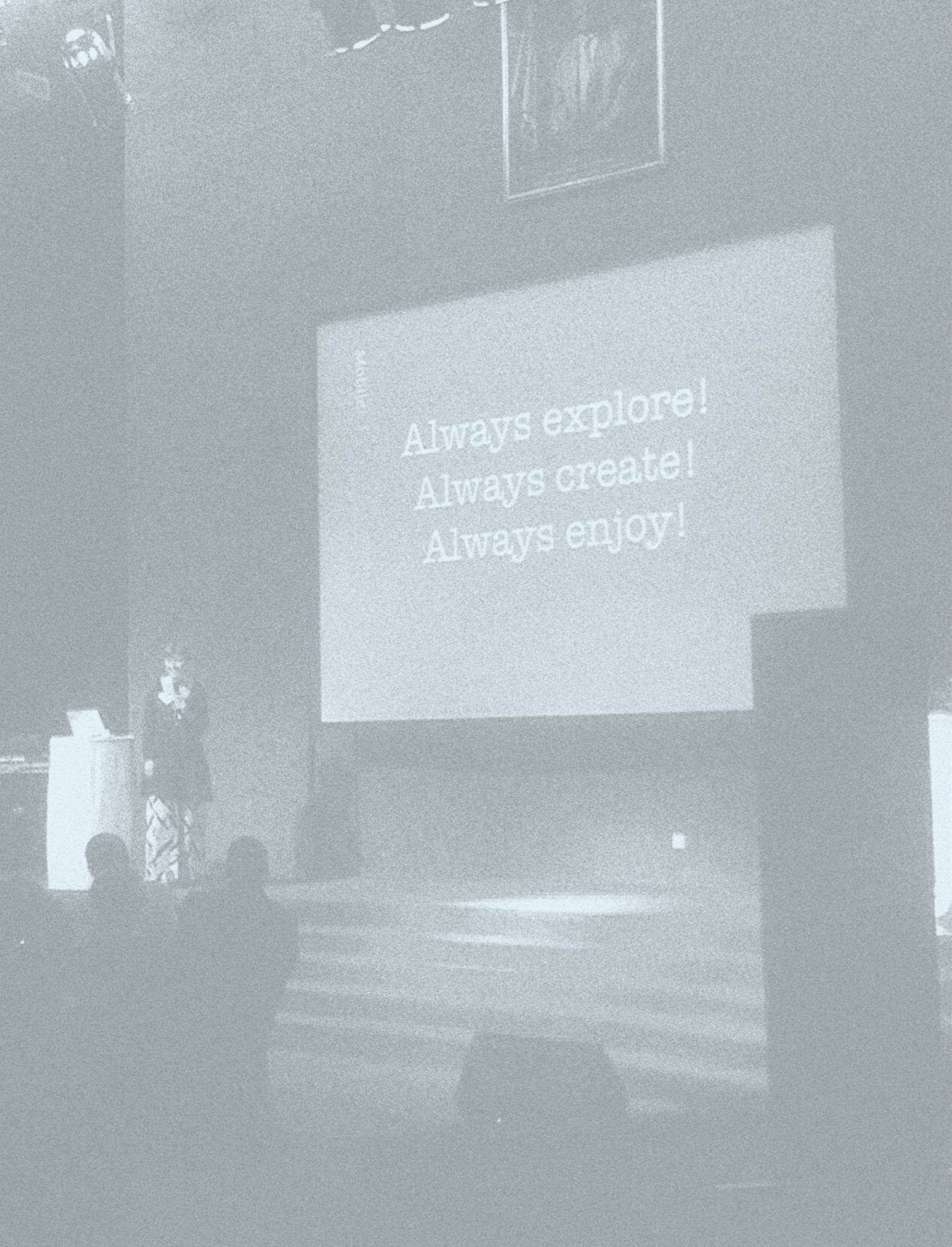
2013-2014

MobileJIT

Always explore!
Always create!
Always enjoy!

VINN Excellence Centre
April 2013 – March 2014





Contents

Always explore!		Publications	33
Always create!		Book	33
Always enjoy!	4	Journal publications	33
		Peer-reviewed conference papers	33
		Other papers	34
Introduction	6	Patent	35
		Doctoral thesis	36
Centre Partners	8	Licentiate theses	36
Research organisations	8	Master's theses	36
Industry partners	8		
Public sector representatives	10	Activities	38
Innovation system partner	11	External activities	38
		Visits at the centre	38
Research	13	Talks, presentations and demos	40
Material Exploration	14	Seminars	42
The Other Big Data	16	Doctoral thesis	44
The Future of Money	18		
Homes & Cities	20	Media	46
LiveNature	22	Press and media appearances	46
mFashion	24		
Clouds and Surfaces	26	The Organisation	48
Internet of Sports	28	The Centre Board	48
Re-mobiling	30	The Academic Advisory Board	48
		Funding	50

Always explore! Always create! Always enjoy!

In this seventh year of the centre, we are starting to see the long-lasting impact of the centre. We have articulated our legacy in the creed: “Always explore! Always create! Always enjoy!” This describes our work in the centre – exploring leisure practices in people’s everyday lives, and creating and designing new technologies and applications for enjoyment, creativity and playfulness, while always enjoying ourselves. It also frames how we expect others to engage with our research products: by being creative, playful and enjoying themselves with the tools and systems we have designed, as well as enjoying our academic papers, books and theses.

Mobile Life is working in a highly turbulent environment with new disruptive technologies and fast-changing markets. In this environment we find ourselves with a mission to investigate and change what comes next. The challenge for us is always to look ahead, to never slow down or be put off by the risk of not immediately succeeding with an idea. So far we have seen many results at the centre that have been 8–10 years ahead of their time; that is, some of our earliest results are highly relevant today. Our work on body, emotion and interaction is highly relevant to the wave of lifestyle and health applications being pushed onto the market today. Our early work treating video as a new medium where many can create their own TV-productions on the fly is no longer frowned upon by those who believed video would mostly be produced by media companies, broadcasted by them to our mobiles. Another area of our early work, pervasive games, is now well established as its own genre. Our work

on location-based apps and the scaling up of testing to include thousands of users is now in every mobile phone, as well as being part of the agenda for much of the academic research.

But the centre does not live in the past. We keep pushing the boundaries for industry and society, challenging ourselves to look a little bit further and see what lies beyond. Today our work addresses provocative topics such as fashion, arts and crafts, somaesthetics and how to deal with big data in the Internet-of-Things era.

These last seven years have passed quickly, and while we have another three years of the centre ahead of us, after that the funding will end, and we will not have the same conditions for running the centre. We have to start asking ourselves what we can and should do after 2017. Given how widespread technologies such as Internet of Things, mobiles, and wearables are, we long for even more interdisciplinarity



in our work: to bring in artists to address the aesthetics of living with this technology, to bring in activists to understand and address the implications of big data, or to bring in architects to understand and change future homes and cities. Perhaps we need to set up a quite different centre with a new constellation of disciplines.

In this vibrant time a whole new market has opened up for start-ups working with applications related to the Internet of Things. During the last year we have started a new network of more loosely connected partners, the *Friends of Mobile Life*, and we are pleased that three friends have already signed up: Ziggy Creative Colony, ayond, and Axfood. Together with our new partners IKEA and ABB, we note that the centre has shifted away from partnering with pure IT- and telecom-companies and now includes more consumer-oriented and IoT-company partners. That allows us to

increase our understanding of the enormous changes our society is going through, with new digital interactions everywhere. If we create a future centre, it needs to navigate in this novel landscape!

So for now and the future, *Always explore!
Always create! Always enjoy!*

Kristina Höök, Centre Director &
Maria Holm, Co-director

Introduction

The Mobile Life VINN Excellence Centre is a design research centre focusing on how information technology can enrich our everyday lives. We do research in the domain of consumer-oriented Internet of Things, investigating what impacts the implementation of this technology will have on our everyday lives. Our vision is to contribute to a society that incorporates enjoyment into all aspects of a good life. Thriving upon new technologies we are designing for the future.

The Mobile Life VINN Excellence Centre was formed in 2007, and has established itself as an internationally recognized research locus in the area of mobile services. The centre is a joint venture between three research partners and eight industrial partners, with funding from the Swedish governmental funding agency, VINNOVA.

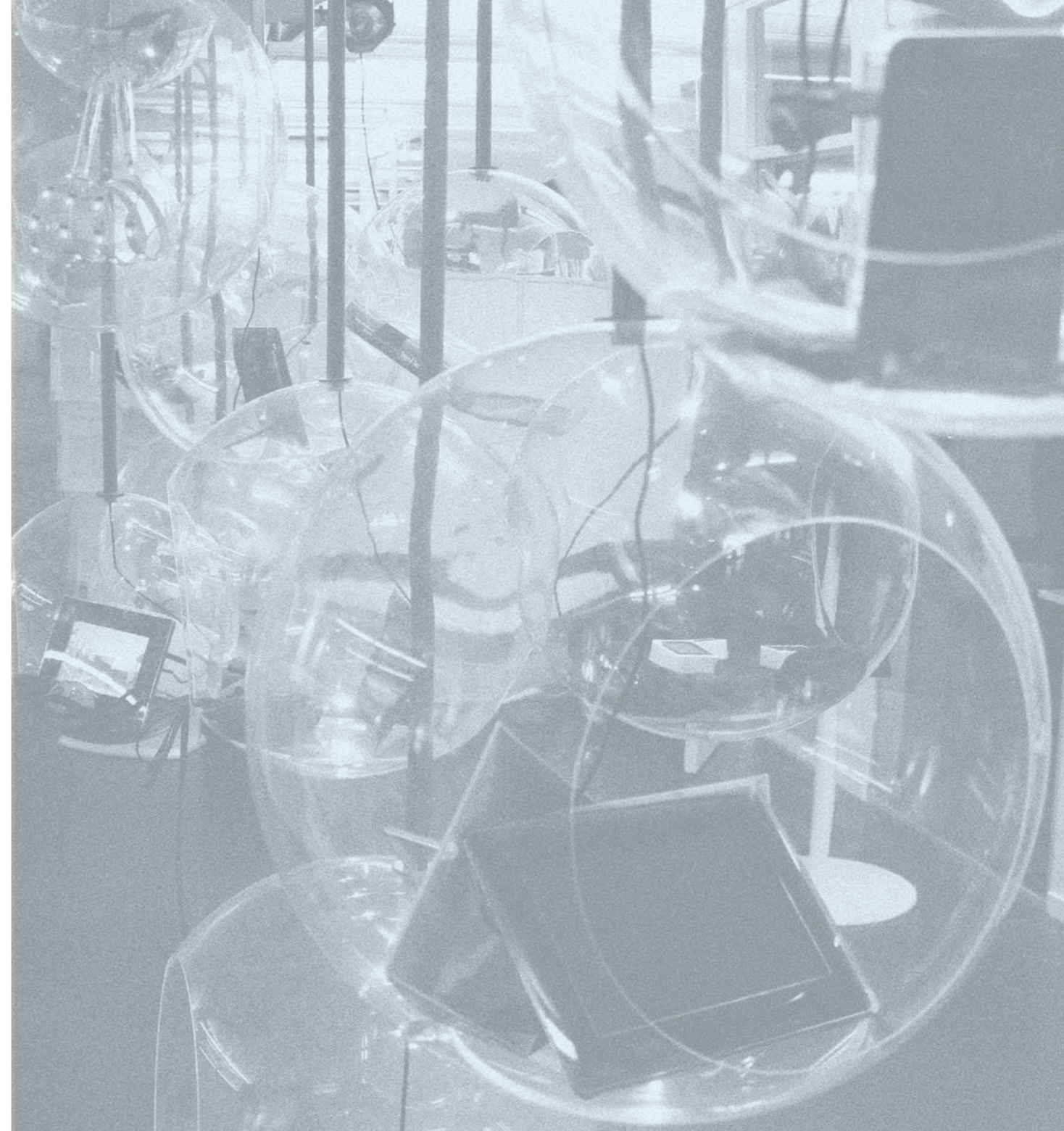
The Mobile Life Centre offers a glimpse of our future life with digital technology; an enjoyment society where happiness, pleasure and play are adopted into all aspects of our lives. The unique strength of the Mobile Life Centre lies in its combination of leading-edge applied research and intensive collaboration with industry.

After seven years, the Mobile Life Centre has grown to comprise about 41 researchers exploring experiential, leisure and playful mobile and ubiquitous interactions. The research is interdisciplinary, involving researchers from computer science, interaction design, sociology, anthropology, media technology and engineering, as well as artists and researchers within fashion studies. The centre's competitive edge lies in carrying out serious research on what might normally be considered "unserious" activities in collaboration with our industry partners Ericsson, Nokia, Microsoft Research,

IKEA, ABB, TeliaSonera, Movinto Fun, Company P and Stockholm City.

During the last year we published one book, five journal articles, and fifteen peer-reviewed conference papers in highly renowned venues. Our research has an impact on what our partners call *strategic innovation*, that is, pointing to new design domains and possibilities before of others thereby influencing their strategic decision. The work has continued with the commercialisation of two systems: Affective Health, which has now been turned into the company Biosync Technology; and the Instant Broadcasting System, which will be further developed as the company Liveling.

Nine projects are currently running at the centre. During the year we have conducted a number of activities, one example being our work together with ABB about enjoyment at work, in which we explored ways to tackle "boredom" in work situations. Other examples are the LiveNature project, which works with the concept of bringing nature into the home to visualise a cherished place, and the Big Data project, which has started to investigate possible different roles of big data users. To learn about all the projects and work done during the year, continue reading this report. And enjoy!



Centre Partners

The Mobile Life Centre is a joint venture with several partners including research organisations, IT- and telecom industry partners, consumer-oriented product partners, and public sector representatives. Read more about our partners in the presentations below.

Research organisations

Stockholm University – Mobile Life is organised as a unit under the Department of Computer and Systems Sciences (DSV) in Kista. The centre is physically located on the Kista campus in the Electrum building. Through Stockholm University, the research in the centre is well connected with undergraduate and graduate programmes and the general social science faculty. Students employed at the centre will be enrolled in the master’s and doctoral programmes at the University. Senior researchers will be actively involved in the creation of such programmes, primarily in this department but also in other university departments at Stockholm University.

SICS Swedish ICT – The mission of SICS is to contribute to the competitiveness of Swedish industry by conducting advanced research in strategic areas of computer science, and to actively promote the use of new research ideas and results in industry and in society at large. SICS is situated in Kista, just outside Stockholm, in close proximity to the Mobile Life Centre. Many of the researchers in Mobile Life are employed at SICS. The role of SICS at Mobile Life Centre is that of a joint research partner together with Stockholm University.

The Royal Institute of Technology (KTH) – The Mobile Life Centre cooperates with KTH’s School of Computer Science and Communication (CSC). CSC is engaged in education and research within the traditional core areas of computer science – numerical analysis and datalogy – from theory construction and analysis of mathematical models via algorithm development to computerised implementation and simulation. Other core areas of growing importance include technology and methods for sustaining human communication and computer-supported cooperation between users separated in time and space. The role of KTH in the Mobile Life Centre will be that of a joint research partner together with Stockholm University. During the upcoming period, KTH will co-fund a PhD student.

Industry partners

Ericsson – Ericsson is a leading provider of telecommunications equipment and related services to mobile and fixed network operators globally. Ericsson has extensive knowledge about present and future telecommunications systems, including content and communication oriented services for mobile devices and the connected home.



Ericsson is advancing its vision of the “networked society” through innovation, technology, and sustainable business solutions. In this Ericsson is very well aligned with the focus of Mobile Life VINN Excellence Centre.

TeliaSonera – TeliaSonera provides network access and telecommunication services that help people and companies communicate in easy, efficient and environmentally friendly ways. International strength combined with local excellence is what makes TeliaSonera truly unique and enables it to provide a world-class customer experience, from the Nordic countries all the way to Nepal. This combination has brought groundbreaking 4G, a world-class fibre network, and the introduction of 3G at Mount Everest. TeliaSonera has been a partner since the centre began in 2007. The centre’s current direction, with forward-looking research around mobile users, applications, and ecosystems, fits well with TeliaSonera’s objectives and helps it understand how to act in the future. TeliaSonera brings to Mobile Life its vast experience of

mobile access and telecommunication services.

Microsoft Research – Microsoft Research is dedicated to conducting both basic and applied research in computer science and software engineering. Microsoft Research has identified three key domains in which support from Microsoft will enable university researchers to achieve the greatest progress: the emerging computing environment, the transformation of science through computing, and advancement of the computer science curriculum. Through its focus on social and mobile services, the Mobile Life Centre targets the first of these areas. The researchers at the centre have a well-established collaboration with Microsoft Research Ltd in Cambridge, resulting in a profound understanding of information technology use in everyday life.

Nokia – Nokia is a pioneer in mobile telecommunications and the world’s leading maker of mobile devices. Today, Nokia is connecting people in new and different ways – fusing advanced mobile technology with personalised services to enable people to stay close to what matters to them. Nokia also provides comprehensive digital map information through NAVTEQ; and equipment, solutions and services for communications networks through Nokia Siemens Networks. Nokia Research Center contributes to the Mobile Life Research Centre particularly in the areas of user experience research, novel applications of mobile multimedia, and future interaction models and metaphors for mobile devices and services.

IKEA – IKEA is a home furnishings company with a fully integrated supply chain, including its own industrial groups – Swedwood and Swedspan. For IKEA, creating its home furnishings catalogue is about understanding the needs and dreams of many people. By matching these to the needs and opportunities within IKEA’s supply network, the company can create a range of well-designed, functional products at extremely affordable prices. IKEA of Sweden AB leads business development at IKEA through the Home Furnishing Businesses. IKEA is especially interested in the centre’s focus on the “good life” – that which makes people feel good and have fun.

ABB – ABB joined the Mobile Life Excellence Centre as a partner in 2012 and contributes to the centre by sharing its knowledge about user experience and situational awareness in the context of industrial systems. In addition, ABB will collaborate on a wide range of research projects that aim to provide operational efficiency in industrial environments. One main project where ABB will be an active player is “Introducing playfulness in the automation domain”. At the Mobile Life Centre, ABB will collaborate with leading researchers and key players in the mobile industry and

gain knowledge about designing experiences, especially for mobile use.

The company P – The company P is located in Stockholm, Sweden. The company P was formed to address the growing demand by audiences to participate and become an integral part of the drama enabled by new digital interactive technologies and social media. The company P is in pursuit of a kind of entertainment that is enjoyable, both as a product to consume and watch, and as a game and event to dig into as deeply as you choose; entertainment that is broadcast and distributed in the most accessible and effective ways that the new technologies allow; entertainment that uses the new means of storytelling, expression and experiences that new media afford us.

Movinto Fun – Movinto Fun creates innovative interactive entertainment products that make people move and have fun. The company was founded in 2007 as a spin off from scientific interdisciplinary research at Interactive Institute and KTH – research merging dance education and interaction design. Movinto Fun is very interested in Mobile Life, especially the areas of interaction design, bodily interaction and games. As a partner, Movinto Fun contributes expertise and knowledge about movement-based interaction and movement-based mobile devices, commercial perspectives on game and product development, and experiences of commercialising research results. Movinto Fun can also provide test platforms (hardware and software) for movement-based interaction concepts that might be used in the projects.

Public sector representatives

City of Stockholm – Within Sweden as a whole, the Stockholm region and Kista in particular are playing a crucial role in the establishment of a consumer-oriented service industry. This role has been recognised by the City of Stockholm, which has chosen to establish and participate in several initiatives focusing on this sector, such as the “Kista Mobile & Multimedia Network”,



as well as participating in the Mobile Life Centre. The City of Stockholm plays a natural central role in the Mobile Life Centre, providing multiple channels for local collaboration, dissemination, and take-up with both small and large companies. The City of Stockholm contributes to the centre by being prepared to serve as a test-user representing the public sector in several project domains. Furthermore the city strives to promote coordination and cooperation regarding the various mobile initiatives in the city.

Kista Science City - Kista is a science city – a creative melting pot where companies, researchers and students collaborate in order to develop and grow. The foremost sector in Kista is ICT. Figures show that few places on the planet can demonstrate the same high concentration of expertise, innovation and business opportunities within ICT. Kista Science City brings to the competence centre its project “Kista Mobile & Multimedia Network”, an active business-oriented network for people and companies within mobile services and multi-media industry. The network serves as a meeting point for researchers, entrepreneurs

and industrial management in a cosmopolitan milieu with a strong focus on business. It is an important component of an ecosystem where government, academia and industry work together to promote growth.

Innovation system partner

STING – STING, Stockholm Innovation & Growth, founded in 2002, is a world class ecosystem for innovative start-ups based in Stockholm. The ecosystem encompasses comprehensive business development support, own financing sources and access to STING’s broad network – all interacting with each other to more rapidly build Sweden’s new international growth companies. STING works primarily with innovative start-ups within ICT, Internet/media, medtech and cleantech – supporting entrepreneurs and innovators from academia, research institutes and the business sector. STING is headquartered in Kista Science City – in the middle of one of the world’s premier ICT clusters. STING is a supportive partner of the centre and contributes its competence as an incubator. STING has been a partner since the founding of the centre in 2007.



Research

During the year, nine research projects have been running in the centre. Ideas for projects are jointly developed by researchers at the centre and our partners. This takes place in various kinds of creative workshops in which the whole centre, including the partners, meet and discuss future challenges. The companies are expected to actively take part in the projects, and the close collaboration that results creates a flow of knowledge from the research projects into the companies.

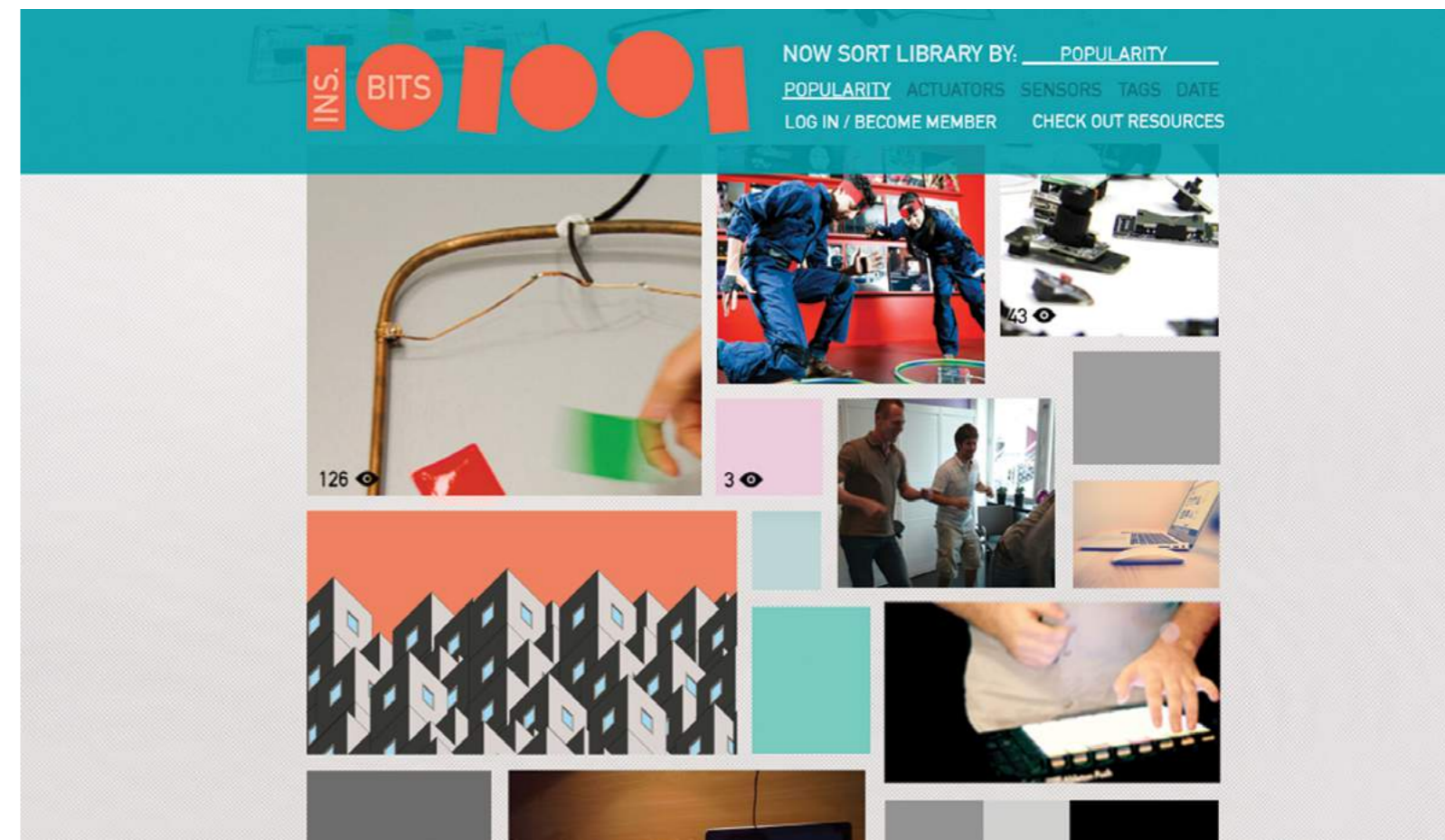
Material Explorations

Designing digital devices and services can feel like building something from LEGO blocks, fitting prefabricated pieces into each other in predefined ways. But what happens if we look more closely at the properties of the hardware and software components we use in our designs? What if we treat such digital materials the same way that we treat analogue materials such as wood, metal, or clay, and learn how their properties affect a user's experience, and how they can be moulded and shaped to create better and sometimes unexpected designs? The aim of the Material Explorations project is to investigate how this can be achieved and thereby foster a deeper understanding of digital materials through a designerly and crafts-oriented approach.

The project pursues three strands of investigation which complement each other: an explorative strand, an applied strand, and a theoretical strand.

- The explorative strand aims to work hands-on with digital materials to uncover their salient properties and how they can be used in designs. A core part of this work is to develop tools that allow for experimentation with digital materials and methods for structuring design work and communicating material properties in understandable and inspiring ways. The latter is crucial for creating a common understanding of the pitfalls and potentials of using a particular material in a new design and is especially important in design teams where members from multiple disciplines come together to work on a design. To further support design teams we are developing a virtual material library that we call the Ins-bits portal.
- The applied strand aims to present design cases that make use of the knowledge and methods developed in the explorative part as a way of validating this work. This includes internal as well as external cases.
- Finally the theoretical strand aims to ground our work in existing theories of materiality but also to expand those theories to accommodate our findings.

Project leaders: *Petra Sundström* and *Jarmo Laaksolahti*, petra@mobilelifecentre.org, jarmo@sics.se



The Other Big Data

Our project focuses on the intersection of big data and people. We are exploring new possibilities for interactive technologies by considering what new roles users might play in relation to big data. Currently, most big data efforts see people either as passive consumers or passive producers of data. During the last year, we have been imagining more active roles for users.

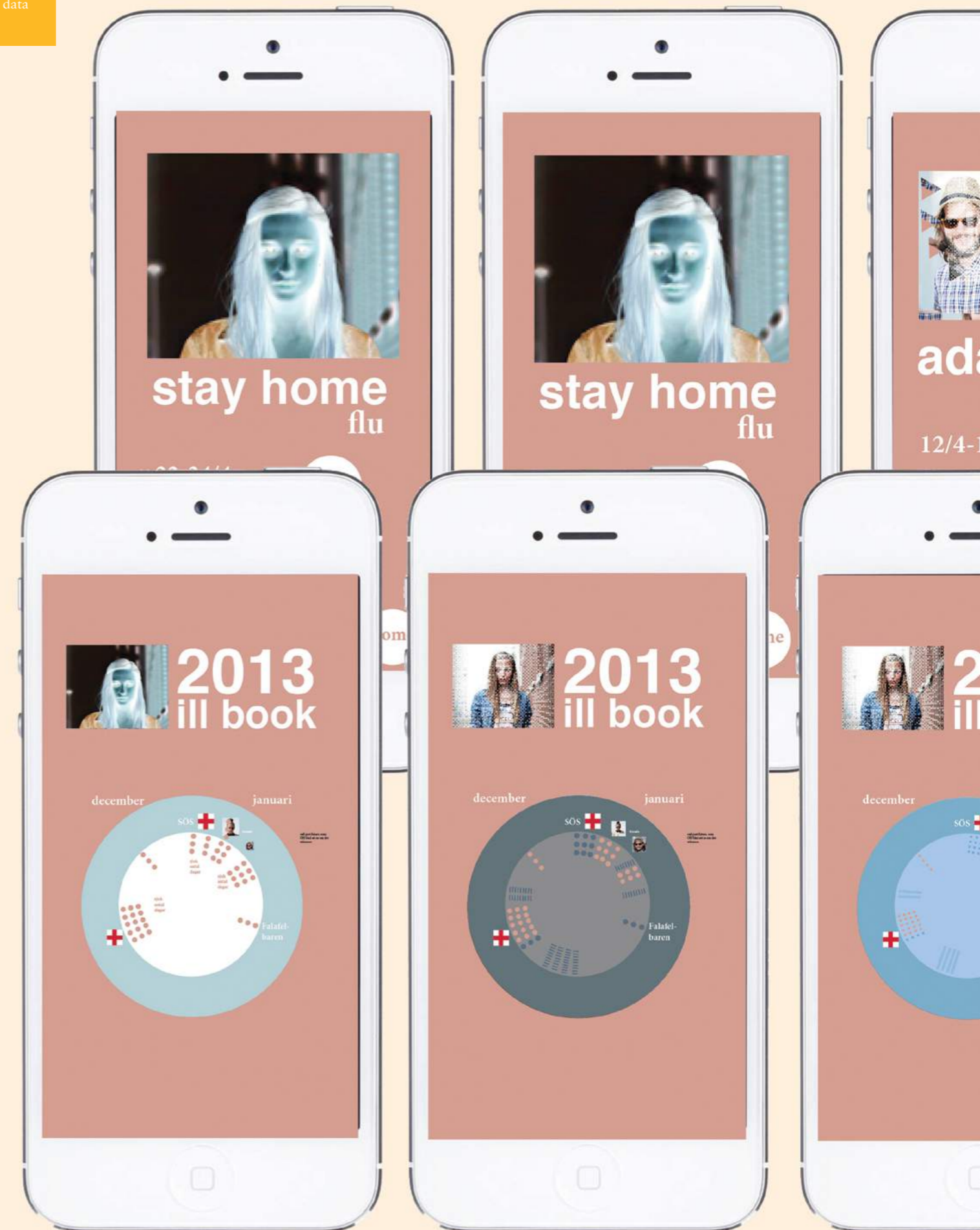
The following questions guide our investigations: Can big data change the way we interact with technologies and with each other? How can ordinary people (non-experts) make sense of big data? How can we give people the means to manipulate data or to influence its aggregation and computation?

One line of investigation focuses on novel interactional opportunities that bring together mobile phones and big telecom data, a collaboration we are undertaking with Ericsson. Using data found in people's phones or emerging from interactions with/through the phone, we are

designing phone applications. For example, one idea aims to enable users to interrogate telecom data – for instance “show me where 20-year-olds hang out in Stockholm on a Friday night” – and receive the answer in visual form, such as a heat map. Another app predicts the user's communication activity (phone calls, SMS) for the next 24 hours: who will call you and when.

Another investigation imagines other roles for big data users. Through speculative designs, we are envisioning how big data could be applied to employment-related matters. Specifically, we have focused on sick leave by designing an app – tentatively called “illbook” – that draws on data patterns to infer when employees usually are sick. This part of the project exposes issues related to data regulation and policy. Furthermore, the designs reveal tensions around the stories that can be told about our bodies with data.

Project leader: *Lucian Leahu*,
lucian@mobilelifecentre.org



The Future of Money

The theme of this project builds on our previous work in the ecosystems project focusing on “the future of money” – understanding how payment systems are changing and the impact this will have on mobile devices and server systems. We have a “dream” of a world where there are no payment systems – where everything is done automatically in the background, with individual consent and no cumbersome security systems. For example, to buy something from a store you might just walk out with the item. Or after a meal in a restaurant you could just leave, and the payment would automatically be deducted from your account. Of course, these concepts may be impossible to realise in some respects – but as ideals they generate a host of interesting technical and social problems to be thought through.

Mobile technology has the potential to make major changes in money and exchange. Perhaps the most well-known examples of this are point-of-sale payment systems (mPesa) and the Japanese KDDI near-field payment systems. If we are generous, then we can also see smart card technology as connected to phone-based technology. Despite promising efforts, however, there has been limited adoption of these technologies. It seems clear that the problems here are not technical as such, but involve a number of complex social, legislative, economic and market issues.

Moving beyond just the point of sale, however, mobile devices also offer a broader interface to our finances. Nearly every bank account or financial institution has a mobile phone app, and with systems such as SWIFT we are seeing the growth of the phone number as a financial identifier. With apps and such, the mobile can be seen as increasing the interface to “our money”. All this depends on one of the most powerful financial institutions – payment providers. The two biggest payment providers are Visa and Mastercard, which act as something of a duopoly, charging quite high rates – particularly for retailers – for handling the exchange of money between customer and vendor.

Lastly, virtual currency has considerable potential to change how we interact with money. On the whole, though, virtual currencies have tended to be used for illegal activity, or as a form of speculation. It seems like there has been little exploration of the potential of mobile virtual currencies – despite their being perfectly feasible – and it is not clear exactly what the new opportunities would be here.

Project leader: *Barry Brown*,
barry@mobilelifecentre.org



Homes & Cities

The Mobile Life vision for future homes and cities starts from our understanding of “the good life” and the richness of what it means to be human – being messy, creative, fun, lazy, aesthetically-interested, party-going, thrill-seeking, social, emotional, lonely or bored. This might, perhaps, be contrasted with visions emphasizing efficiency, utility or solving societal problems.

In a workshop with all the partners of the centre, we explored trends and visions for homes and cities of the future. We learnt how:

- Interactive technologies may contribute to the “blurring between homes and cities”. That is, interactions that take place in those spaces that are neither entirely confined to the home nor entirely public, such as playgrounds or laundry rooms.
- A re-negotiation is taking place about which spaces in the home that are accessible to guests and which are entirely private – sometimes dynamically shifting the same space from one status to the other. Again, various interactive technologies (as well as furniture) may contribute to such shifts, changing a private space into one where friends can hang around.
- There is a lack of direction when it comes to designing for the “senses” beyond mere utility when it comes to adults, while with children, this is a recurring aim and theme both in the home and the city. Instead, utilitarian values come to the foreground in most homes-and-cities designs that involve interactive technologies.

We were particularly inspired by IKEA’s idea to start design processes from our “hearts” – our bodies, experiences, senses, emotions – by first designing the intimate spaces in our homes, and then continuing, step by step, to the public spaces in our homes, the semi-public places, the whole building, the block, its surroundings and finally all the way to the larger city – or even the mega-city as discussed by Mikael Anneroth at Ericsson.

To start exploring such a process of “designing from the inside out”, we held a design workshop in IKEA’s test apartment in Malmö. It started with a soma-experience – a Feldenkrais-exercise. We then tested and experienced the sensual, interactive technologies we have experimented with in other projects: interactive coloured light, heat pads, vibrations and rhythmic visualisations. A range of design concepts were developed that will be built and tested during the upcoming period.

Project leader: *Kristina Höök*,
kia@mobilelifecentre.org



The city, the buildings, our homes, the public space...

LiveNature

It is as if we never really get used to staying indoors as much as modern life requires. Modern interior design excels at experimenting with ways to turn our homes inside out and make nature meet culture. Windows get larger and locations are selected to provide scenic views. In the same manner, people flee the indoor life to some cherished place, which could be a primitive house along a river, a beach or a park in the city. This project invents new mobile media and investigates how such media, and live video broadcasting in particular, could be combined with sensor-data on temperature, tension and acceleration to generate a new type of live decorations in the home, providing not only the aesthetics of nature but also a particular and intimate sense of meaning related to historical events and promises of a future to come. The challenge is two-fold. First we need to understand the experience of cherished places, as well what technologies

could be used and how systems should be designed to be able to work in these rough environments. Second, we need to grasp what it means to do decoration in a home, accounting both for aesthetic and practical demands.

During the last few years, we have done a series of design experiments ranging from brainstorming and sketching to building lo-fidelity prototypes and evaluating them through pilot studies, to reach a resulting concept. This has then been developed into a prototype system, which is deployed in collaboration with IKEA in their "Living Lab", where a large number of ordinary families come and stay for two weeks.

Project leader: *Oskar Juhlin*,
oskar@mobilelifecentre.org



mFashion

The increasing emphasis on experiences within mobile interaction design has brought the selection of colours, materials, and form to the fore. However, the discussion of such aspects of design research has not yet accounted for how the users themselves, as well as industry, notice these aspects, e.g. as forms of fashion, and view them in relation to people's complete outfits.

Fashion logics are a part of the context within which users select colour and material. Neglecting to understand fashion dynamics might lead to both missed opportunities and a decrease in the take-up of new applications. Teasing out the difference between consumption of mobile experiences as some sort of de facto product and symbolic fashion-oriented experiences is of importance for design-oriented research in the mobile area. How do we need to account for fashion logics in mobile interaction design?

How can we understand the purchase and use of mobile technology as a form of fashion consumption? Where and when does mobile design overlap with fashion design and the fashion industry? What unexplored fashion areas would be interesting to combine with mobile design and where do they come from?

During the last year Oskar Juhlin and Yanqing Zhang have continued to conduct research in this area together with Ylva Fernaeus and Vasiliki Tsaknaki. The focus has been on studies of the mobile phone industry's relation to fashion as well as design-oriented studies of clothing-related materials such as leather.

Project leader: *Oskar Juhlin*,
oskar@mobilelifecentre.org



Fashion
logics in
mobile
interaction
design

Clouds and Surfaces

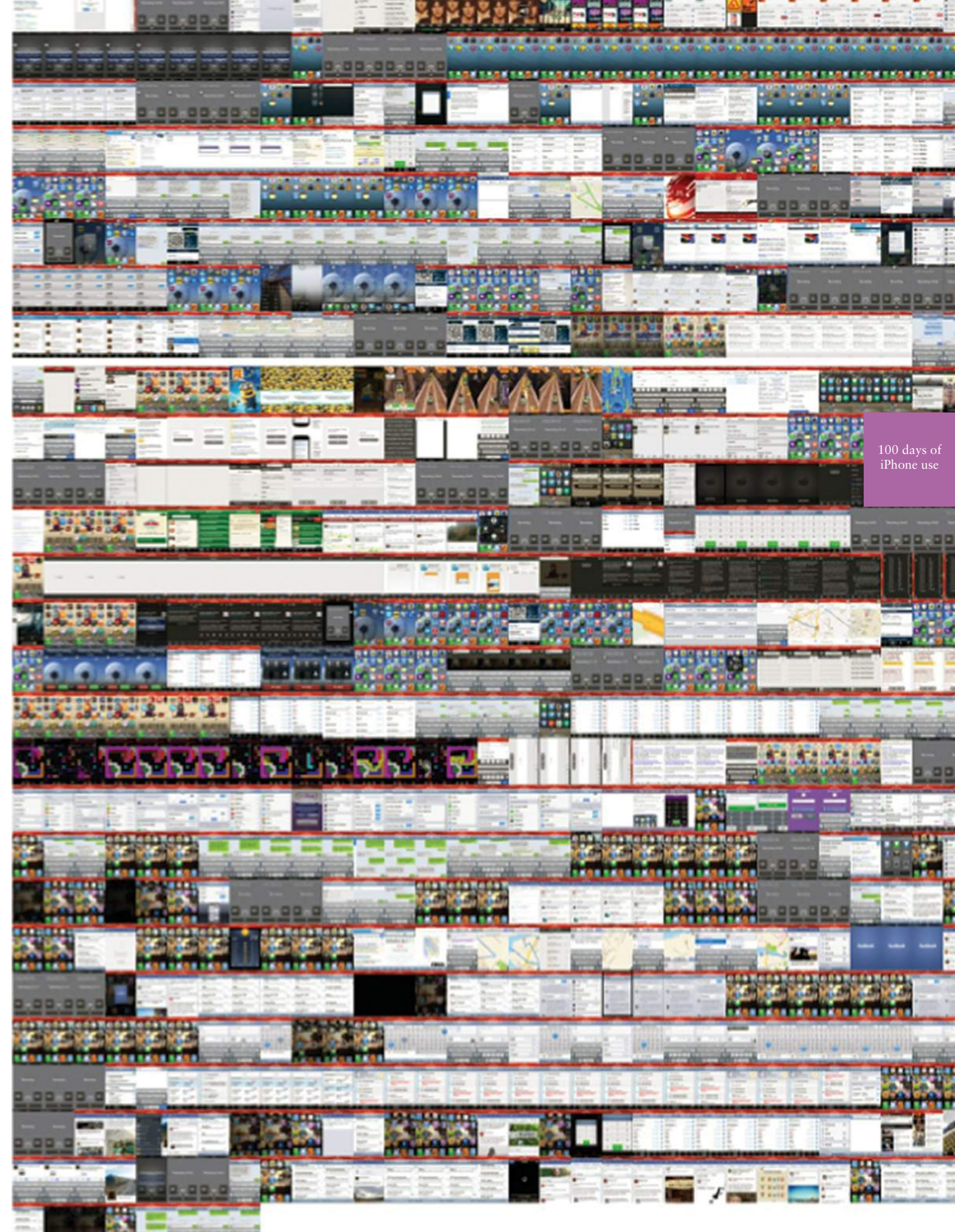
The Clouds and Surfaces project was completed this year focusing on understanding how cloud and surface computing relate to each other. The project had two distinct threads. The first investigated and presented findings from an interview study exploring users' relationships with their physical, digital and cloud media such as music, books and films. Discussions covered the differing experiences of media based upon the affordances of the different formats. These interviews formed the basis of several design concepts for a tangible interface for Spotify that were developed for IKEA earlier in the year. The project was documented in a paper written in collaboration with Microsoft research.

The second thread of the Clouds and Surfaces project examines the roles of screens; for this we have been recording iPhone screen activity over extended periods of time, as well as details of ambient audio, GPS location and app usage. The project has collected over 176 hours of video recordings of everyday iPhone use. The data from the study provides a uniquely detailed view of how messages, social media and internet use are integrated and threaded into daily life, as well as how mobile users interact with other people and with everyday events such as transport, communication, work and entertainment. Two papers analysing the resulting video data are in

submission; one paper considers how information search plays out on the device including the role of context and co-present others in the sequence of interaction. The second paper, "100 days of iPhone use: Mobile recording in the wild", has been published at a CHI conference in extended abstract format, and has been accepted to Mobile HCI 2014 as a full paper.

In collaboration with Microsoft research in Cambridge we analysed data collected on the use of mobile messaging and social media in social context to allow greater understanding of how new forms of communication and technology are woven into our everyday lives. We have also worked with Nokia to expand our understanding of how clouds and surfaces are used. A paper from this work is being drafted for the journal Personal and Ubiquitous Computing. Moreover, a workshop was arranged in Göteborg, "Screens in interaction", bringing together a range of researchers who are studying interaction around screens, including Paul Luff of King's College and Christian Licoppe from Paris Tech. Lastly, a final extended trial of the screen recording software is planned, spanning both iPad and iPhone use.

Project leader: *Barry Brown*,
barry@mobilelifecentre.org



Internet of Sports

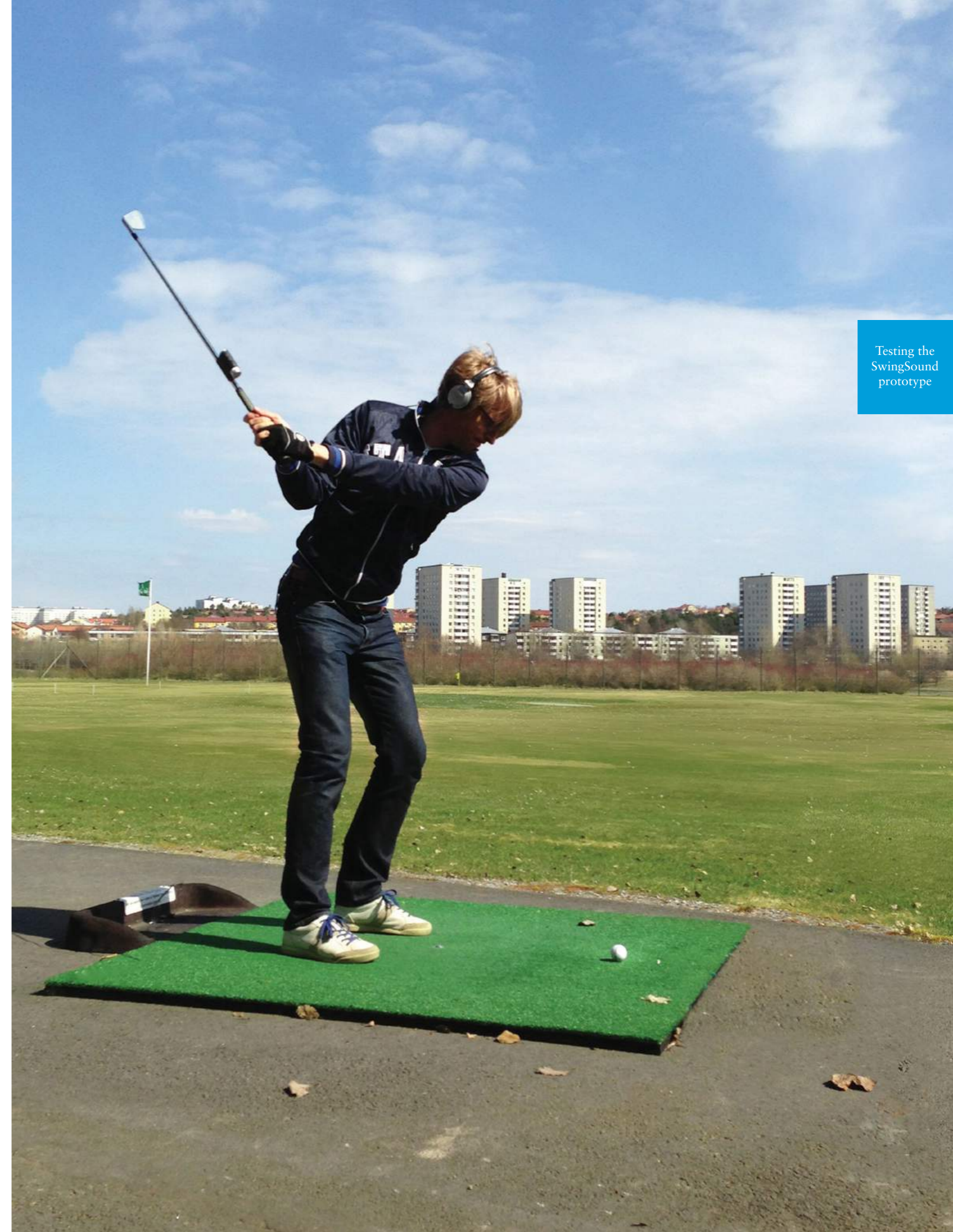
Internet of sports explores how the new Internet of Things (IoT) infrastructures can be used to augment individual and social experiences of sports and physical activity through interaction around aspects such as movement and bio-data, sociality, and sharing of bodily and performance-related data.

The current trend in sports technology focuses strongly on performance and the measuring of physiological data. This is an important part of sports as such, but our work also reveals that athletes emphasise other factors than basic measures such as speed, distance or heart-rate monitoring. In our recent interviews, athletes stressed the subjective feeling of the activity. Elite as well as recreational athletes are striving to achieve a certain feeling in their body. Current technology does not complement the development of such subjective feelings that many argue are necessary to performing well. We argue that technology can help athletes develop this feeling by providing external feedback and interaction

mechanisms that effectively can be combined with their own sensations in the activity, e.g. by comparing heart-rate to their subjective experience of their sports. However, at this point, sports technology is not designed for such forms of interaction.

We believe future sports technology will expand from comprising data collection and measurement tools that leave all the interpretation of raw data to users, to providing forms of support that are tailored for personal interpretation by connecting the data to the individual and social experience. Such technology developments require new ways of measuring the performance and experience of the activity to help athletes relate to their own data and to make it more meaningful to share their data with others.

Project leader: *Stina Nylander*, stny@sics.se



Testing the SwingSound prototype

Re-mobiling

By taking apart the mobile phone – in terms of both its form and its services – we aim to create alternative ways of interacting with its basic functionalities. We find inspiration in revisiting and reformulating our understanding of time and bodily behaviours.

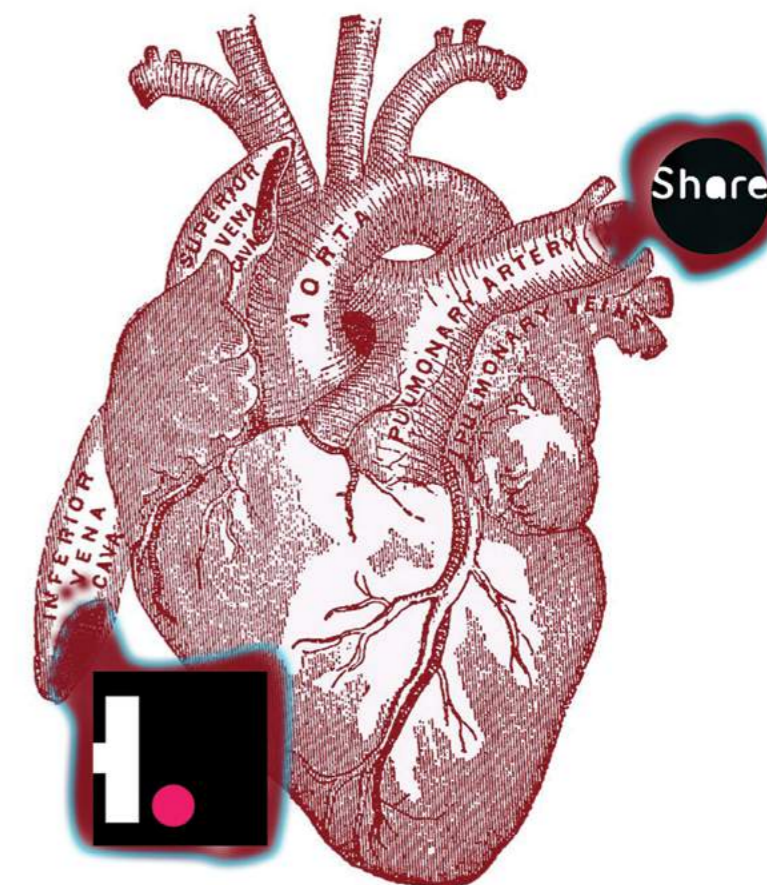
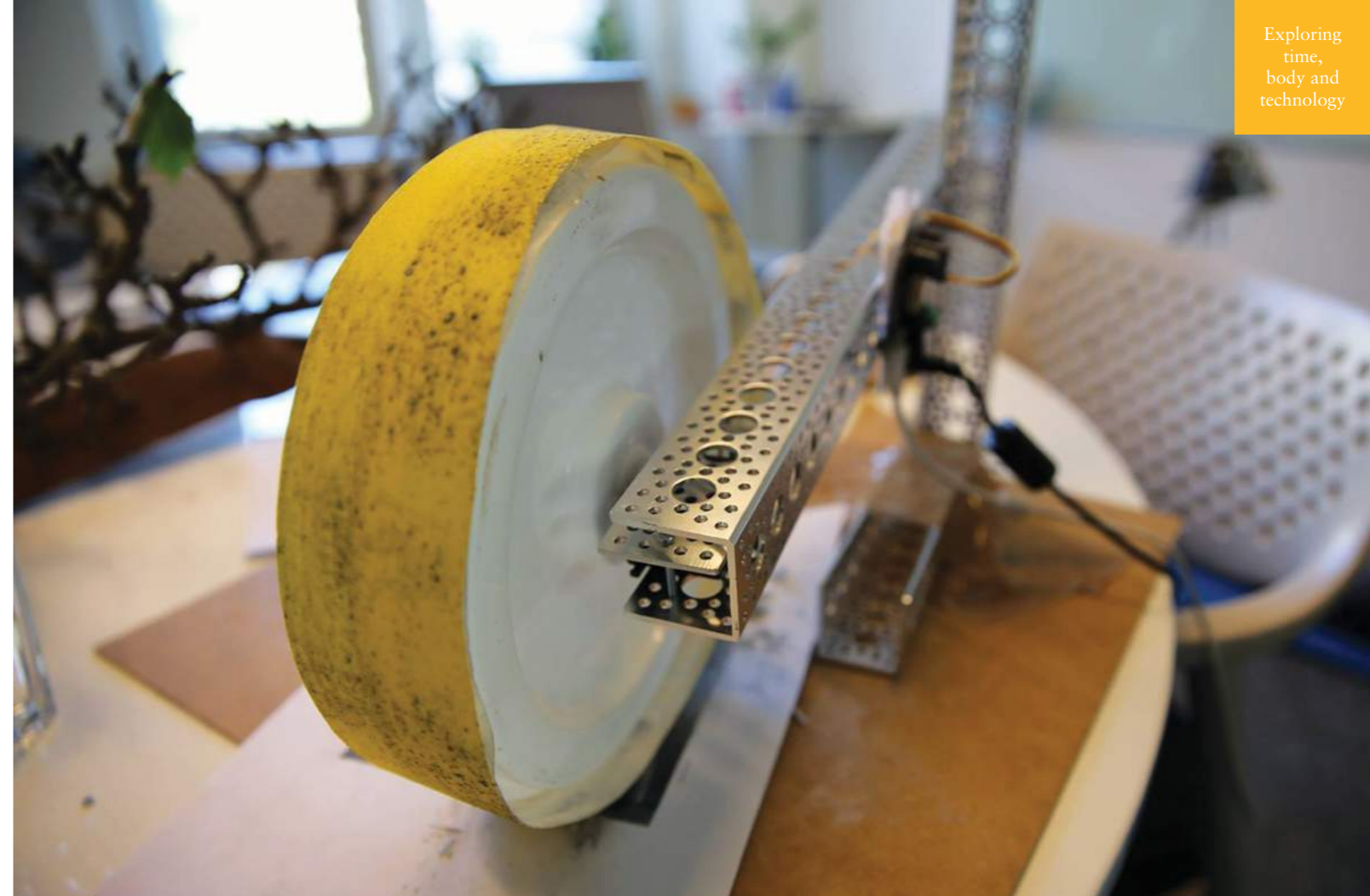
To question the basic form and functionality of the mobile, we have turned to applied aesthetics and ethnographic methods. We hold workshops exploring the bodily, rhythmic sense of time through sourdough baking and music. We have studied the social, cultural and bodily practices in Vanuatu in the South Pacific, and we study people's pace in life, which is forced to follow the landscape of recharging (the phone batteries). We also explore the acts of forgetting and deleting (SMS messages) through the rhythms and text aesthetics of Haiku poetry.

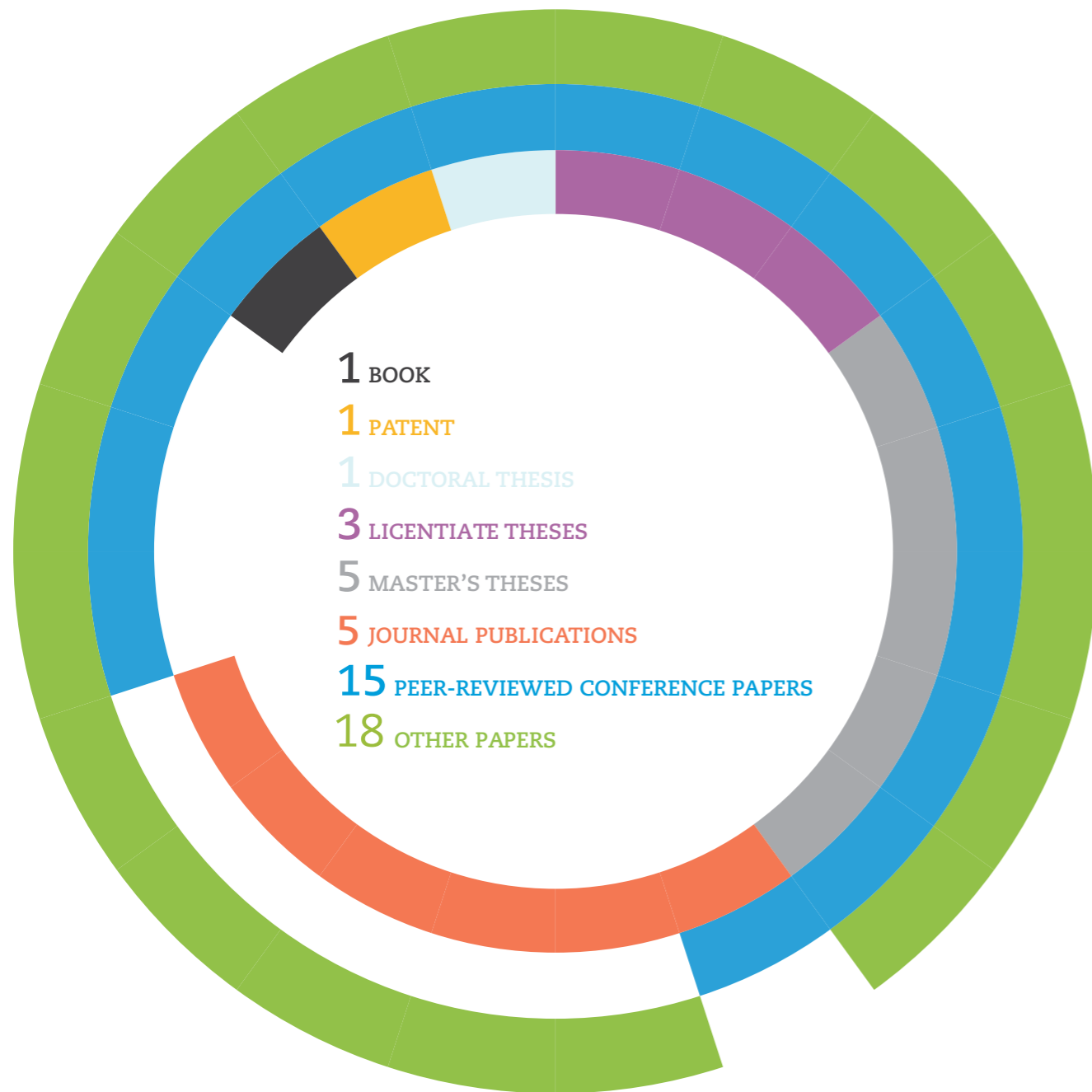
We have learnt that saving old text messages and call logs is not solely a positive feature. We have also learned to see how we move and protect our mobiles in our everyday lives. And we have uncovered our behaviour of prioritising the charging of phone batteries in everyday life. In the Re-mobiling project we search for designs where temporality is inherent in the materials and the movements of the user. The aim is to allow people to experience time through rhythms and tempos that change together with changing characteristics of a material, rather than through a clock or a metronome external to the process.

We develop concepts for basic mobile functionality. For example we have built a mobile application that enables us to follow users' movements and charging habits relative to position. The data reveals how users employ a whole range of strategies to manage their mobile batteries, trying to figure out what the crude measurement provided by the battery symbol really means in terms of usage. In parallel with this study we explore the aesthetics and behaviour how, where and when people charge their mobile phone and de-charge their mobile phone. We investigate possibilities to illustrate and visualise the behaviour and movement of charging the mobile phone.

In the mobile application "delete by Haiku" we use poetry to create something beautiful from all the text messages that are stored on the mobile phone and that have been deleted and are kept in the "trash bin" of the mobile phone. Text messages contain a lot of memories of relations and events in life. "Delete by Haiku" allows users to delete text messages, and at the same time upcycle them into memorable poems and new narratives.

Project leader: *Elsa Kosmack-Vaara*,
elsa@mobilelifecentre.org





Publications

Book

- 1 Price, S., Jewitt, C., and Brown, B. (eds.). (2013). The SAGE Handbook of Digital Technology Research. Sage.

Journal Publications

- 1 Juhlin, O., Zoric, G., Engström, A., and Reponen, E. (2013). Video interaction: a research agenda. Personal and Ubiquitous Computing, Springer. London. pp. 1–8.
- 2 Mughal, M. A., and Juhlin, O. (2013). Context-dependent software solutions to handle video synchronization and delay in collaborative live mobile video production. Personal and Ubiquitous Computing. pp. 1–13.
- 3 Osswald, S., Sundström, P., and Tscheligi, M. (2013). The Front Seat Passenger: How to Transfer Qualitative Findings into Design. International Journal of Vehicular Technology, vol.14, 2013.
- 4 Ståhl, A., Löwgren, J., and Höök, K. (2014). Evocative balance: Designing for interactional empowerment. International Journal of Design, 8(1), pp. 43–57.
- 5 Weilenmann, A., Säljö, R., and Engström, A., (2013). Mobile Video Literacy: Negotiating the Use of a New Visual Technology. In Journal of Personal and Ubiquitous Computing, Special Issue on Video Interaction. March 2014, Volume 18, Issue 3, pp. 737–752.

Peer-reviewed Conference Papers

- 1 Aylett, R., Kriegel, M., Wallace, I., Márques Segura, E., Mercurio, J., Nylander, S., and Vargas, P. (2013). Do I remember you? Memory and identity in multiple embodiments. In Proceedings of IEEE RoMan 2013, Gyeongju, South Korea.
- 2 Back, J., and Waern, A. (2013). “We are two strong women” – Designing Empowerment in a Pervasive Game. In Proceedings of DiGRA 2013: DeFragging Game Studies, Atlanta, GA, USA.
- 3 Barkhuus, L., Engstrom, A., and Zoric, G. (2014). Watching the Footwork: Second Screen Interaction at a Dance and Music Performance. In Proceedings of CHI 2014, Toronto, Canada.
- 4 Ferreira, P., and Sanches, P., and Weilenmann, A. (2013). Awareness, Transience and Temporality: Design Opportunities from Rah Island In Proceedings of INTERACT 2013, Cape Town, South Africa.
- 5 Juhlin, O., Engström, A., and Önnvall, E. (2014). Long Tail TV (revisited): From (ordinary) camera phone use to Pro-Am video production In Proceedings of CHI 2014, Toronto, Canada.
- 6 Juhlin, O., and Weilenmann, A. (2013). Making sense of screen mobility: dynamic maps and cartographic literacy in a highly mobile activity In Proceedings of Mobile HCI 2013, Munich, Germany.

- 7 Marfisi-Schottman, I., Labat, J. M., and Carron, T. (2013). Building on the Case Teaching Method to Generate Learning Games Relevant to Numerous Educational Fields. In Proceedings of IEEE 2013, ICALT, Beijing, China.
- 8 Marne, B., Carron, T., Labat, J. M., and Marfisi-Schottman, I. (2013). MoPPLiq: A Model for Pedagogical Adaptation of Serious Game Scenarios. In Proceedings of IEEE 2013, ICALT, Beijing, China.
- 9 Meschtscherjakov, A., Gschwendtner, C., Tscheligi, M., and Sundström, P. (2013). Co-designing for NFC and ATMs: an inspirational bits approach. In Proceedings of MobileHCI 2013, Munich, Germany.
- 10 Mughal, M.A. Zoric, G., and Juhlin, O. (2014). Frame Rate Exclusive Sync Management of Live Video Streams in Collaborative Mobile Production Environment. In Proceedings MoVid2014, Singapore.
- 11 Mullane, A., Laaksolahti, J., and Svanæs, D. (2014). Wearable probes for service design. In Proceedings of ServDes 2014, Lancaster, UK.
- 12 Perterer, N., Sundström, P., Meschtscherjakov, A., Wilfinger, D. and Tscheligi, M. (2013). Come drive with me: an ethnographic study of driver-passenger pairs to inform future in-car assistance. In Proceedings of CSCW 2013, San Antonio, Texas, USA.
- 13 Šimbelis, V., Lundström, A., Höök, K., Solsona, J., and Lewandowski, V. (2014). Metaphone: Machine Aesthetics Meets Interaction Design. In Proceedings of CHI 2014, Toronto, Canada.
- 14 Tholander, J., and Normark, M. (2014). Performativity in Sustainable Interaction: The Case of Seasonal Grocery Shopping in EcoFriends. In Proceedings of CHI 2014, Toronto, Canada.
- 15 Zoric, G., Barkhuus, L., Engström, A., and Önnvall, E. (2013). Panoramic video: design challenges and implications for content interaction. In Proceedings of EuroITV 2013. Como, Italy.
- Other Papers**
- 1 Aspling, F. (2013). Exploring trail camera hunting – Place awareness, efficiency and enjoyment. In Proceedings of ITICAM 2013, Dubai, UAE.
- 2 Aylett, R., Kriegel, M., Wallace, I., Márquez Segura, E., Mercurio, J., and Nylander, S. (2013). Memory and the Design of Migrating Virtual Agents. In Extended abstract AAMAS 2013, Saint Paul, Minnesota, USA.
- 3 Ferreira, J., Vertesi, J., Kaye, J, Brown, B., and Perry, M. (2014). #CHIMoney: Financial Interactions, Digital Cash, Capital Exchange and Mobile Money. Workshop In Proceedings of CHI 2014, Toronto, Canada.
- 4 Höök, K. (2013). Commentary on: Shusterman, Richard (2013). Somaesthetics. In: Soegaard, Mads and Dam, Rikke Friis (eds.). “The Encyclopedia of Human Computer Interaction, 2nd Ed.”. Aarhus, Denmark. The Interaction Design Foundation. <http://www.interaction-design.org/encyclopedia/somaesthetics.html>
- 5 Höök, K. (2013). Affect and Experiential Approaches. The SAGE Handbook of Digital Technology Research, p. 174.
- 6 Höök, K. (2012). Affective Computing. In: Soegaard, Mads and Dam, Rikke Friis (eds.). “The Encyclopedia of Human Computer Interaction, 2nd Ed.”. Aarhus, Denmark: The Interaction Design Foundation. http://www.interaction-design.org/encyclopedia/affective_computing.html
- 7 Leahu, L. (2013). Diffracting Big Data Discourses and Practices through Design Interventions. In Proceedings of 4S/EASST conference, Copenhagen, Denmark.
- 8 McGregor, M., Brown, B., and McMillan, D. (2014). 100 days of iPhone Use. Work in progress, In Proceedings of CHI 2014, Toronto, Canada.
- 9 Mentis, H., Höök, K., Mueller, F., Isbister, K., Poonkhin Khut, G., and Robertson, T. (2014). Designing for the Experiential Body. Panel In proceedings of CHI 2014, Toronto, Canada.
- 10 Mueller, F., Marshall, J., Khot, R.A., Nylander, S. and Tholander, J. (2014). Jogging with Technology. Special Interest Group, In Extended Abstract of CHI 2014, Toronto, Canada.
- 11 Murer, M., Jacobsson, M., Sundström, P., and Skillgate, S., (2014). Taking Things Apart: Reaching Common Ground and Shared Material Understanding. In Extended Abstract of CHI 2014, Toronto, Canada.
- 12 Nylander, S., Jacobsson, M. and Tholander, J. (2014). RunRight – Real-Time Visual and Audio Feedback on Running. Interactivity. In Extended Abstract of CHI 2014, Toronto, Canada.
- 13 Nylander, S., Kent, A., and Tholander, J. (2014). SwingSound – Experiencing the Golf Swing through Sound. Interactivity. In Extended Abstract of CHI 2014, Toronto, Canada.
- 14 Nylander, S., Tholander, J. and Kent, A. (2013). Peripheral interaction for sports – exploring two modalities for real-time feedback. In Proceedings of the INTERACT workshop on Peripheral Interaction. Cape Town, South Africa.
- 15 Nylander, S., Tholander, J., Mueller, F., and Marshall, J. (2014). HCI and Sports. Workshop proposal. In Extended Abstract of CHI 2014. Toronto, Canada.
- 16 Tscheligi, M., Isbister, K., Höök, K., Obrist, M., Busch, M., and Hochleitner, C. (2014). “Touch me” Workshop on Tactile User Experience Evaluation Methods. In Proceedings of CHI 2014, Toronto, Canada.
- 17 Wilfinger, D., Meschtscherjakov, A., Tscheligi, M. and Sundström, P. (2013). Entertainment technology in transportation against frustration, aggression and irrationality. Workshop In proceedings of MobileHCI 2013, Munich, Germany.
- 18 Zhu, B. T., Kürth-Landwehr, S., and Corbi, V. G. (2014). YU: an artistic exploration of interface design for home healthcare. Short paper. In Proceedings of TEI 2014, Munich, Germany.
- Patent**
- 1 Juhlin, O., Engström, A., Toussi R., Adler M., (2013). Mobile vision mixer Patent, European Patent Office 10167720.1-1902/2403236

Doctoral Thesis

- 1 Jacobsson, M. (2013). Tinkering with Interactive Materials – Studies, Concepts and Prototypes. Doctoral thesis in Human-Computer Interaction (CSC/KTH) at the Royal Institute of Technology Stockholm.

Licentiate Theses

- 1 Back, J. (2013). Designing Activity and Creating Experience – On People’s Play in Public Spaces. Licentiate thesis at the Department of Computer and Systems Sciences (DSV) at Stockholm University.
- 2 Márquez Segura, E. (2013). Body Games – Designing for Movement-Based Play in Co-located Social Settings. Licentiate thesis at the Department of Computer and Systems Sciences (DSV) at Stockholm University.
- 3 Önnvall, E. (2014). Television practices – Ethnography, Television and User Practices. Licentiate thesis at the Department of Computer and Systems Sciences (DSV) at Stockholm University.

Master’s Theses

- 1 Akkaya, D. (2013). Wireless Inspirational Bits for Facilitating Early Design. Master’s thesis at the School of Information and Communication Technology at the Royal Institute of Technology Stockholm.
- 2 Biehl, M. (2013). Sketching movement-based interactions – Defining Guidelines for Tool Support in Interdisciplinary Teams. Master’s thesis at the Department of Informatics and Media at Uppsala University.
- 3 Kent, A. (2013). A prototype sonification system for the golf swing. Master’s thesis at the Department of Computer and Systems Sciences at Stockholm University.
- 4 Kürth-Landwehr, S. (2013). Reflections on YU: introducing project management tools into the design process. Master’s thesis at the School of Natural Sciences, Technology and Environmental Studies at Södertörn University.
- 5 Mandiracioglu, Ece. (2013). Decentralized Game-mastering in Pervasive Games: Introducing Sage Role to “Codename: Heroes”. Master’s Thesis at the Department of Information Engineering and Computer Science at the University of Trento.



Activities

Mobile Life Centre is also involved in many activities outside of the centre and the joint venture. During the year we have received several invitations from organisations keen to learn more about what Mobile Life is doing. Some of the activities are listed below.

External activities

April 2013. Mobile Life Homecoming Day. People from Mobile Life who have moved on to other organisations were invited for a full day of discussions about the centre. Lars Erik Holmquist (Yahoo!), Sara Ljungblad (Lots Design), Alexandra Weilenmann (Göteborg University), Henriette Cramer (Yahoo!), and Jarmo Laksolahti (post doc at the IT University in Copenhagen) came to give their views on the strengths of the centre. They were specifically asked for their reflections on things that Mobile Life does well, in an attempt to identify these strengths and reinforce them. Our experiences from the homecoming day and from a similar workshop conducted with the board will be fed into the strategic plan aiming to increase Mobile Life's impact during its final three years.

May 2013. A book launch was arranged for the centre's book on happiness and play, Plei-Plei, at the CHI conference at Institut Suédois in Paris. The event was attended by about 60 people from academia and industry, as well as local contacts.

August 2013. Exselent and Mobile Life, the two centres located at Stockholm University, together with VINNOVA and the Swedish Research Council held a Centre Day in Stockholm. The event was held at Moderna Museet and attracted about 200 people. The conference addressed people from academia as well as industry and focused on how to promote innovation in Sweden.

October 2013. Vygandas Simbelis, artist and PhD student, and Anders Lundström, PhD student and interaction designer, demonstrated the Metaphone project at Jönköpings läns museum.

December 2013. Kristina Höök was invited to give a presentation at the conference Sweden@Zambia in Lusaka, Zambia. The event was organised by the Swedish Embassy in Zambia, SI (Svenska institutet) and the Tällberg foundation. It attracted about 220 Zambian entrepreneurs within a variety of areas such as social entrepreneurship, the creative industry, tourism, and organizing events. The three-day conference focused on women's entrepreneurship and included presentations, performances and workshops.

December 2013. This year's VIP Open house was again very successful. 82 people attended the event, and the Walk and Talk led by Tomas Bennich from our partner Kista Science started many discussions that continued during the evening. The centre presented eighteen demos, among them, LiveNature, with its interactive curtain; mFashion, with the concept of ShapeSwitching; Arts & Crafts, which is forming ideas around interactivity with new materials; Delete by Haiku; Enjoyment@work; and many more.

Visits at the centre

May 2013. The centre was visited by Professor Richard Shusterman who gave a workshop on somaesthetics. The workshop combined a lecture with practical physical exercises (Feldenkrais method) and design exercises. The goal is to develop new ways of doing design as well as designing for better somatic awareness.

May 2013. SICS was visited by a management team from Schneider Electric. The group was on a tour to meet with IT companies and research institutes to learn about leading technology and IT research in Sweden. Petra

Sundström gave the group a guided tour through the centre and presented some of the research projects.

May 2013. The IT-consultancy firm Cybercom visited the centre and met with Petra Sundström and Maria Holm. The future for IT start-ups and IT firms within the Internet of Things domain was discussed. Experiences, thoughts and knowledge were shared across the boundaries of academia and industry.

May 2013. Managers from FOI, Westinghouse, Umeå energy and SABO visited the centre. The purpose of the visit was to see the creative research environment and design of the Mobile Life Centre.

June 2013. Mobile Life visited Ziggy Creative Colony at their offices on Långholmsgatan. The evening was aimed to share knowledge and ideas about work done. Mobile Life demos were presented and Ziggy presented their work.

August 2013, September 2013 and December 2013. Assistant professor Anna Vallgård from IT University of Copenhagen visited the centre while collaborating on a paper with Petra Sundström and Ylva Fernaeus.

October 2013. Fidelity investment, a privately owned American financial services firm, visited the centre to learn what research on future applications, systems and services could look like. Fidelity conducts research, development and implementation in many diverse areas such as mobile, evolving user interfaces, social, analytics, cloud, health/wellbeing, gaming, humans augmented and behavioural economics. Fidelity's research has a strong overlap with the centre's areas of investigation.

November 2013. Associate Professor Tomas Sokoler (ITU Copenhagen) and Proferssor Dag Svanæs, NTNU in Trondheim, visited to give a seminar and initiate planning for a joint EU

proposal in the health domain, more specifically in physical rehabilitation.

November 2013. Hans Persson, Vice President of Technology Strategy and Innovation at AB Volvo Group Trucks Technology, visited the centre to see a demo of the control room probes.

January 2014. Robert Brunbäck, Chief Marketing Officer, Telenor Connexion, and Fredrik Östbye, VP Business Development, visited the centre and met with Maria Holm and Kristina Höök.

February 2014. 3M visited the centre. Petra Sundström served as host, giving them a presentation as well as a tour of the centre. During the tour Mattias Jacobsson, Jordi Solsona Belenguer, Barry Brown, Stina Nylander and Petra Sundström demoed a number of Mobile Life prototypes.

February 2014. EIT ICT labs visited the centre and was organised for Gilles Betis, AL Leader ULM as an introduction to the EIT ICT labs Stockholm node and partners in Kista. Barry Brown hosted the visit.

March 2014. Svenska Institutet (SI) organised a visit in Stockholm and Kista for a Chinese delegation from Tsinghua University and the Centre for National Research and Cultural Industries. The director of New Media Studies was part of the delegation and showed an interest in the work conducted at the centre. Maria Holm and Oskar Juhlin hosted the meeting.

March 2014. An IoT Meetup was organised by Mattias Jacobsson from Mobile Life together with Anders Mellbratt from Ziggy Creative Colony. The theme for the Meetup was IoT and Research. Mobile Life hosted the event, where about 60 participants viewed a handful of mature IoT and Internet of sports related demonstrations. The event was much appreciated and talked about afterwards.

Talks, presentations and demos

April 2013. The Metaphone was exhibited as a unique installation at the CHI 2013 conference in Paris in the section of the conference called Interactivity.

April 2013. Vygandas Simbelis exhibited the Metaphone in Berlin at an art exhibition.

May 2013. The Metaphone was exhibited at DKTUS art space in Stockholm.

May 2013. Petra Sundström spoke at Data Explosion arranged by Computer Sweden at Moderna Museet in Stockholm.

June 2013. Kristina Höök gave a presentation at the Digital Horizons seminar at KTH, arranged by the Economist.

August 2013. Petra Sundström, research leader at Mobile Life and lab manager at SICS Swedish ICT, presented at the annual conference Media Evolution. Petra Sundström talked about how the design process needs to consider digital materials such as Bluetooth and sensors in the same way designers have worked with traditional materials, such as paper, plastic or wood.

August 2013. Petra Sundström presented her material research and Mobile Life at “The Conference”, an international conference organised annually by Media Evolution in Malmö, Sweden.

September 2013. Petra Sundström was invited to be the Keynote Speaker at the Automation Summit in Västerås. She presented her work on more joyful and engaging control rooms.

September 2013. Stina Nylander was invited to present the work in Internet of Sports, and the project Lead Users In Orienteering As Resources For Innovative Sports Products in particular, at the Internet of Sports Day at SICS Software week. The talk (in Swedish) was videotaped and is available from <https://www.sics.se/events/internet-of-sports-day-2013-program-and-downloads>.

September 2013. Petra Sundström served as

opponent at Jonas Forsslund’s licentiate thesis defence, KTH.

October 2013. Vygandas Simbelis, artist and PhD student, and Anders Lundström, PhD student and interaction designer, gave a presentation and demonstration of the Metaphone at Jönköpings läns museum.

October 2013. Mattias Jacobsson and Petra Sundström visited the Stockholm Maker Space.

October 2013. Stina Nylander presented the project Lead Users In Orienteering As Resources For Innovative Sports Products and demonstrated RunRight at Dataföreningen’s after work on “how to use technology to enhance our capabilities”.

November 2013. Petra Sundström presented the centre at the Oredev conference, an annual international conference organised by Jayway in Malmö, Sweden.

November 2013. Kristina Höök gave a talk at TeliaSonera’s M2M-conference. Her session focused on “M2M Toolbox” and was organised by Richard Savage at Qualcomm.

November 2013. Kristina Höök gave a talk at an “Arena e-förvaltning”-event organised by Karin Öhlander at PWC. The aim was to discuss possibilities and challenges for the future government organisations.

November 2013. Oskar Juhlin gave a public lecture on the future of video at Södertörn University.

November 2013. Oskar Juhlin presented research on “video interaction” at the higher seminar at Södertörn University.

November 2013. Stina Nylander participated in a three-day workshop on gameful prevention and treatment strategies for type 2 diabetes, organised by the Games and Experimental Entertainment labs in Karlsruhe. The workshop was a joint activity with the pharmaceutical company Novartis, and gathered partners



from the pharmaceutical, medical, and game industries, as well as academia.

December 2013. Jarmo Laaksolahti presented the Inspirational Bits concept and the upcoming Insbits portal at a workshop for the partners of the consumer-oriented IoT project.

December 2013. Kristina Höök gave a seminar at KTH on the 50th anniversary of NADA.
January 2014. Oskar Juhlin gave a presentation titled Inventing and investigating for fashionable interaction at New Frontiers of HCI Research at SIG CHI in Helsinki, Finland.

January 2014. Kristina Höök gave a seminar at our sister-centre Wireless@KTH on Where is your soma? Designing for Somaesthetics.

January 2014. Kristina Höök gave a seminar at CERTEC, University of Lund, on Designing for Somaesthetics.

February 2014. Petra Sundström presented Mobile Life's perspective on IoT at the Mobilitet 2014 conference.

February 2014. Petra Sundström presented Mobile Life's perspective on IoT as part of a design course provided by Boris design at Hong Kong School of Design.

February 2014. Petra Sundström gave an inspirational workshop using the random words method at Scania on the topic of how Scania potentially could use the one function tech probes method used during the Material Explorations study at KVV.

March 2014. Mattias Jacobsson presented an overview of Mobile Life and parts of his past research as guest lecturer for a Behaviour and Social Science course at SU/DSV.

March 2014. Kristina Höök and Johanna Mercurio gave a seminar at Daytona on how to Design for Somaesthetics.

March 2014. Stina Nylander presented the research from Internet of Sports at

Vårdförbundet (Swedish Association of Health Professionals) and took part in a discussion on Internet of Things and its future implications for health, health care, and health care professionals.

March 2014. Petra Sundström gave a presentation on Internet of Things at the Swedish Urban Network Associations Conference (svenska stadsnätsföreningens konferens) in Luleå.

March 2014. At the annual SICS Open house, Mobile Life presented and demoed Inspirational bits, Somaesthetics, and Delete by Haiku. Susanne Timsjö, ABB, gave a talk about the technical probes; enjoyment@work, which was developed by Mobile Life for ABB; and a study of KVV in Västerås.

Seminars

May 2013. Professor Barry Brown and Professor Oskar Juhlin held a seminar on "Happiness", kicking off the new Mobile Life seminar series. The aim of the seminar was to discuss a couple of chapters from their forthcoming book Enjoying Machines, MIT Press.

June 2013. Danielle Wilde, an Australian-based artist and design-technology researcher, gave a talk on Embodying Neuroplastic Change. Wilde discussed three case studies that demonstrate how embodied interaction, in particular enriched engagement in artistic activities, may powerfully complement existing techniques for stimulating neuroplastic change.

October 2013. Assistant Professor Sebastian Boring from the HCC Group at the University of Copenhagen gave a seminar entitled: Making Public Displays Interactive Everywhere – Tracking Technologies and Sensing Concepts that allow for Deployment in Many Spaces.

October 2013. PhD student Mattias Svahn, Handelshögskolan, gave a seminar entitled: Persuasive pervasive games analyzed with small scale causal modelling. The talk focused on how and why a pervasive persuasive game managed to impact attitudes and behaviour and

it also included a glimpse of Svahn's method for Partial least square based structural equation modelling.

November 2013. Stuart Reeves, EPSRC Senior Research Fellow at the Mixed Reality Lab, School of Computer Science at the University of Nottingham, gave a seminar entitled: Theory to practice in HCI, where he provided an overview of his recent research.

November 2013. Steve Harrison, Associate Professor at Virginia Tech, gave a seminar entitled: Co-design with American School Teachers – explorations in an over-constrained setting. The talk gave an overview of an ongoing project in which they work with middle-school core curricular teachers to co-design technologies that promote computational thinking.

November 2013. Professor Barry Brown gave a seminar entitled The iPhone. The talk discussed the secret history of the iPhone: how it was developed, and how it depended upon Apple's involvement in UI innovation way beyond what the academic field was attempting at that time. He also discussed the Clouds & Surfaces project's work on recording and analysing iPhone use.

December 2013. Professor Daniel Fällman from Interactive Institute in Umeå held a seminar at KTH entitled The New Good: Exploring the Potential of Philosophy of Technology to Contribute to Human-Computer Interaction.

December 2013. Floyd Mueller from RMIT in Melbourne, Australia, held a seminar entitled Designing Exertion Games. The research proposes that we should look at the body as a design opportunity to enhance the digital play experience. Mueller argued that this can be achieved by framing the body's limitations as challenges that can facilitate bodily play, as inspired by sports.

December 2013. David Martin, Xerox Research Centre Europe (XRCE) in Grenoble, France, held a seminar entitled Being A Turker. Relying

on previous research, Martin illustrated practical and ethical issues relating to working with Turkers and AMT, in order to promote design directions to support Turkers and their relationships with Requesters.

January 2014. In conjunction with the Future of Money workshop, Jofish Kaye from Yahoo! Labs held a seminar entitled Counting & Coordinating: How people track their personal finances.

February 2014. Alan Said, postdoctoral researcher, and Marie Curie, fellow at Centrum Wiskunde and Informatica in Amsterdam, held a seminar entitled Evaluating Recommender Systems. The talk focussed on recommendation contexts and what evaluation models that are applicable in which scenarios and settings.

February 2014. Eva Hoggan, Research Fellow at the Aalto Science Institute and the Helsinki Institute for Information Technology HIIT in Finland, held a seminar entitled Augmenting Communication with Multimodal Interaction and Flexible Interfaces. The talk tackled the types of information that can be expressed between two people using the haptic modality, and the impact of different feedback designs.

March 2014. PhD candidate Martijn ten Bhömer, from Eindhoven University of Technology, held a seminar entitled Towards Embodied Smart Textiles. Bhömer talked about the relations between three elements related to embodiment: the interfaces of the smart textile services, the collaborations taking place in the value network, and the experiential prototypes that are developed.

March 2014. Molly Wright Steenson, Assistant Professor at the University of Wisconsin, Madison, held a seminar entitled Data Places. What does it mean when data creates a sense of place? This talk explored the concept of data places, ranging from consumer genetic testing to 1970s data environments at MIT.

Tinkering with Interactive Materials

Mattias Jacobsson: Tinkering with Interactive Materials - Studies, Concepts and Prototypes. Doctoral thesis in Human-Computer Interaction at the Royal Institute of Technology.



Mattias Jacobsson successfully defended his thesis, Tinkering with Interactive Materials – Studies, Concepts and Prototypes, at the Royal Institute of Technology, Stockholm.

The concept of tinkering is a central practice within research in the field of Human-Computer Interaction, dealing with new interactive forms and technologies. In this thesis, tinkering is discussed not only as a practice for interaction design in general, but as an attitude that calls for a deeper reflection over research practices, knowledge generation and the recent movements in the direction of materials and materiality within the field. The presented research exemplifies practices and studies in relation to interactive technology through a number of projects, all revolving around the design and interaction with physical interactive artefacts. In particular, nearly all projects are focused around robotic artefacts for consumer settings. Three main contributions are presented in terms of studies, prototypes and concepts, together with a conceptual discussion around tinkering framed as an attitude within interaction design. The results from this research revolve around how grounding is achieved, partly through studies of existing interaction and partly through how tinkering-oriented activities generate knowledge in relation to design concepts, built prototypes and real world interaction.



Media

Press and media appearances

April 2013. Swedish Fashion: the Design Heritage to New Fashion System. Celia Yanqing Zhang has been selected as a contributor for one of the biggest fashion trend websites in China: Fashion trend digest. She has published an article in Chinese on the website.

April 2013. “This is where you want to work” “If I was 25 again I would have been attracted to work at the Mobile Life Centre in Kista”. This is what Helene Ahlbom, journalist at Ny Teknik, writes in her article about Mobile Life.

April 2013. Every year the magazine Computer Sweden lists the 50 most powerful women in IT in Sweden. Kristina Höök was listed for the fifth year in a row. Kristina Höök is one of the leading researchers within the Internet of Things domain as well as one of the founders of the Mobile Life Centre. She was also appointed to be part of the government’s IT advisory board.

May 2013. Affective Health and Metaphone (Vegas Simbelis and Anders Lundström in particular) were mentioned in a program named “programme called “Spanarna” on national Swedish radio, P1. Per Naroskin talks about the project in a positive, but slightly jokey way 25 minutes into the programme.

May 2013. Mobile Life was again mentioned in the Swedish trend-spotting programme “Spanarna” on P1. Per Naroskin refers to Oskar Juhlin and Elin Önnvall’s study: On the Relation of Ordinary Gestures to TV Screens: General Lessons for the Design of Collaborative Interactive Technique. Per Naroskin summarises

it by saying, “the future belongs not only to the big gestures, but to the beautiful gestures”.

June 2013. Kia Höök appeared on Sveriges Radio P1 in the “*Vetenskap & Miljö*” programme with the title: “*Avslöjar du hälsouppgifter i sociala medier?*”.

July 2013. Ingrid Jacobsson published an article in *Råd & Rön* titled “*Datorn som känselspröt*” with a tagline claiming: “*20 years ago, the web arose and spread around the world. In 2007 the iPhone was launched for the first time. Now, computers are reading our emotions.*”

July 2013. “*Datorn som känselspröt*”. An interview with Kristina Höök published in the journal, *Råd&Rön*.

July 2013. Katie Humphrey published an article in the *Star Tribune* titled “*GPS devices may not be all that accurate*”, citing work by Barry Brown.

August 2013. A press release went out for the “*Centre Day 2013*”. The event was organised by the Mobile Life VINN Excellence Centre, Exselent Berzelii Centre, VINNOVA and Vetenskapsrådet.

September 2013. The *SAGE Handbook of Digital Technology Research*, edited by Barry Brown, Sara Price and Carey Jewitt was published.

September 2013. Journalists from the *Dustin* internal magazine interviewed Petra Sundström about Internet of Things.



November 2013. Donald McMillan and Kristina Höök were interviewed by the Swedish newspaper DN (Dagens Nyheter). They comment on the future of mobile phones and current research in the Internet of Things domain.

December 2013. “*Snart kan bilen kommunicera med din telefon*”. Kristina Höök comments on Internet of Things in the Swedish newspaper DN (Dagens Nyheter).

December 2013. Kristina Höök comments on the Internet of Things on the Swedish Radio channel P1.

March 2014. Kristina Höök and Darja Isaksson, Ziggy Creative Colony, published a debate article in Sweden’s biggest morning paper DN (Dagens Nyheter), urging the Swedish government to take action and make Sweden a test bed for the Internet of Things.

March 2014. Kristina Höök on how to introduce maker culture into schools. In “*Datorn i Utbildningen*” pages 2–14.

The Organisation

The Centre Board

Chair

Mikael Ydholm, IKEA

Members

Christer Norström, SICS
 Jyri Huopaniemi, Nokia
 Karin Bergmark, Stockholm University
 Magnus Larsson, ABB
 Niklas Björk, Ericsson
 Richard Harper, Microsoft research
 Roger Bengtsson, TeliaSonera
 Stefan Carlson, City of Stockholm
 Ulf Eriksson, SU Holding

Deputies

Alex Taylor, Microsoft research
 Anders Trana, TeliaSonera
 Elina Vartiainen, ABB
 Johan Ejdemo, IKEA
 Marja Salmimaa, Nokia
 Mikael Anneroth, Ericsson
 Monica Berneström, City of Stockholm

People at the Centre

Anna Ståhl, PhD student, SICS
 Annika Waern, professor, Uppsala University
 Antoine Loriette, research assistant, Stockholm University
 Arvid Engström, PhD, Interactive Institute / Stockholm University
 Alex Kent, master's student, Stockholm University
 Barry Brown, professor, Co-director, Senior research leader, Stockholm University
 Bin (Tina) Zhu, PhD student, KTH
 Celia Yanqing Zhang, PhD student, Stockholm University
 Deniz Akkaya, research assistant, SICS
 Dina Titkova, master's student, Karolinska Institute
 Donald McMillan, ERCIM post doctoral fellow, Stockholm University
 Ece Mandiracioglu, master's student, KTH
 Elena Márquez Segura, PhD student, Uppsala University
 Elin Önnvall, PhD student, Stockholm University
 Elsa Kosmack-Vaara, PhD student, SICS
 Fergus Bisset, research assistant, SICS
 Fredrik Aspling, PhD student, Stockholm University
 Goranka Zoric, PhD, Interactive Institute

The Academic Advisory Board

Elizabeth Churchill, Director of Human
 Computer Interaction, eBay, California, USA

Masa Inakage, Dean, Graduate School of Media
 Design, Keio University, Japan

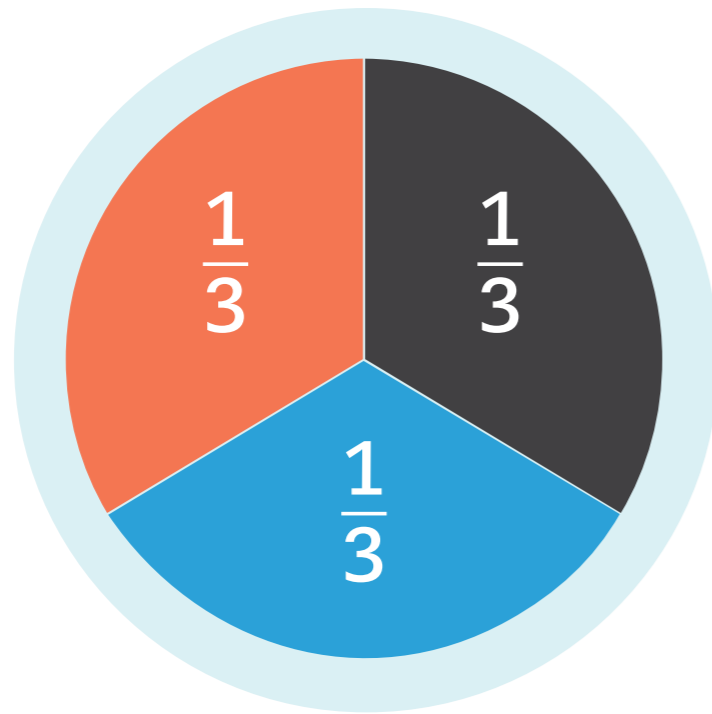
Paul Dourish, Professor, Donald Bren School of
 Information and Computer Sciences, University
 of California Irvine, USA

Paul Luff, Professor, School of Social Science
 and Public Policy, King's College, London, UK

Tom Rodden, Professor, School of Computer
 Science and IT, Nottingham University, UK

William Gaver, Professor, Department of Design,
 Goldsmith University of London, UK

Iza Marfisi-Schottman, ERCIM post doctoral fellow, SICS
 Jakob Tholander, associate professor, Stockholm University
 Janin Koch, master's student, KTH
 Jarmo Laakso, Postdoc researcher, SICS
 Jinyi Wang, PhD student, Stockholm University
 Johanna Mercurio, researcher, SICS
 Jon Back, PhD student, Uppsala University
 Jonas Celander Guss, master's student, Uppsala University
 Jordi Solsona Beleunger, PhD student, KTH
 Kamyar Niroumand, research assistant, SICS
 Kim Nevelsteen, PhD student, Stockholm University
 Kristina Höök, professor, centre director, Senior research leader, KTH
 Lidija Murselovic, master's student, KTH
 Lucian Leahu, ERCIM post doctoral fellow, KTH
 Maria Holm, Co-director, SICS
 Maria Normark, PhD, VINN MER, Södertörn University
 Marisa Cohn, PhD, Visiting researcher, University of California
 Marten Biehl, master's student, Uppsala University
 Martin Murer, PhD student, Salzburg University
 Mattias Jacobsson, PhD, researcher, SICS
 Mattias Svahn, Guest PhD student, Stockholm School of Economics
 Mert Gunday Karadogan, master's student, KTH
 Michela Grisi, guest designer, Politecnico de Milano
 Moira McGregor, research assistant, Stockholm University
 Mudassir Ahmed Mughal, PhD student, Stockholm University
 Muhammad Yasir Munir, master's student, KTH
 Nathalie Peira, PhD, researcher, KTH
 Naveen Ramani, master's student, Mid Sweden University
 Oskar Juhlin, professor, founder, Stockholm University
 Pedro Ferreira, PhD student, KTH
 Petra Sundström, lab manager, senior research leader, SICS
 Roy Marten, master's student, University of Southern Denmark
 Serena Raschella, guest designer, Politecnico de Milano
 Sophie Kürth-Landwehr, management assistant, SICS
 Stina Nylander, PhD, researcher, SICS
 Syed Naseh, research assistant, SICS
 Tom Homewood, research assistant, SICS
 Vania Raquel Lamas, research assistant, Stockholm University
 Vasiliki Tsaknaki, PhD student, KTH
 Victor Guerrero Corbi, research assisant, KTH
 Vincent Lewandowski, PhD student, KTH
 Vygandas Simbelis, PhD student, KTH
 Xiaolin, Zhao, master's student, KTH
 Yixian Chan, master's student, KTH
 Ylva Fernaeus, associate professor, KTH



Funding

VINNOVA – the Swedish Governmental Agency for Innovation Systems – is Sweden’s innovation agency. Its mission is to promote sustainable growth by improving the conditions for innovation, as well as funding needs-driven research.

VINNOVA is currently funding 17 different VINN Excellence Centres for a period of 10 years. These provide a forum for collaboration between the private and public sectors, universities and colleges, research institutes and other organisations that conduct research.

The Centres deal with both basic and applied research and work to ensure that new

knowledge and technological developments lead to new products, processes and services.

One third of the funding for the VINN Excellence Centres comes from VINNOVA; one third from a Swedish University; and one third from industry partners. The Mobile Centre is funded by one third from VINNOVA, one third from Stockholm University, together with the research collaborators SICS Swedish ICT and KTH, and one third from the industry partners; Ericsson, Microsoft Research, Nokia, IKEA, ABB, TeliaSonera, Company P, Moveinto Fun, Stockholm City and Kista Science City.



Mobile Life VINN Excellence Centre

Visiting address:
Electrum Building, Floor B6
Isafjordsgatan 22/ Kistagången 16
164 40 Kista

Postal address:
Stockholms University
DSV, Forum 100
164 40 Kista, Sweden

Mobile Life VINN Excellence Centre
at Stockholm University

Partners: SICS and KTH, Ericsson, Microsoft
Research, Nokia, TeliaSonera, IKEA, ABB, Movinto
Fun, Company P, City of Stockholm, Kista Science
City, STING



Stockholm
University