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When technology becomes magical: A look at magical interactions using digital technology with the help of science fiction

By
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Deadline 3rd of June 2019

MSc IT Product Design
Master's Thesis
Supervisor: Danielle Wilde

Preface

These past four months have been a bit of a struggle for me. But I made it this far and I am proud of the work I have accomplished.

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I have a few people I would like to thank.

I would like to give very big thank you to my supervisor Danielle Wilde. It felt like you asked us for the impossible long before I felt able to do it, but it gave me a chance to make something, get feedback and then return to it later. I had the foundation for a couple of solid chapters when the workload started to seem overwhelming. You were kind when I needed it and you have always been tough but fair. I trusted you to get me through this and I am endlessly thankful that I made it.

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Abstract

In this project I have used the genre of science fiction as an angle for research into what makes interaction with "sufficiently advanced technology indistinguishable from magic" (Clarke, 1999). In order to design better products and services, we should look at these small and big moments when we experience something out of the ordinary.

My approach has been an exploration through tinkering and narratives; more specifically small stories of lived experiences and design fictions.

The contribution to the field of interaction design is a better understanding of when and why these moments occur and the connection between technology and magic. It also contributes to the use of design fiction as a qualitative method, in this case, as way of inquiry into a very specific experience.

Contents

1

Introduction

1.1 Introduction to the project

In this chapter I will cover what the project is about, the challenges I have had and my motivation for doing it, before getting into what I mean by magical experiences and how science fiction can help in the exploration.

Some students already have an idea of what they want to do for their Master's thesis project long before they reach the final semester. I am not one of those students. Luckily it has worked out despite that.

As a reflection on a quote by Clinton Sanders, Svend Brinkmann argues for turning casual everyday interests into research interests. Brinkmann says "I hope to demonstrate with [the book *Qualitative inquiry in everyday life: Working with everyday life materials*] that it is legitimate to add small-scale analysis of everyday life materials to the canon of qualitative research methods." (Brinkmann, 2012, p.3) This was exactly my starting point for this project. I have an interest in science fiction as a literary genre and interaction design. I wanted to join the two topics in this project to take a look at those small moments that occasionally happen with digital technology. The moments that seem magical. In the grand scheme of things, it might seem insignificant, but my goal with the project is to create an understanding of what make some products/devices/services stand out compared to others — if we understand them, it will be easier to design for them in the future.

This topic came from my own curiosity of an everyday moment, but it is also of interest to the HCI community as pointed out by Majken Kirkegård Rasmussen: "Despite the focus on the potential of magic within technology, few have provided reflection on how and what creates magical experiences." (Rasmussen, 2013, p. 126)

1.2 Challenges

My main challenge during this project has been myself. Overcoming the fear of putting things out into the world for them to be judged by other people, has been hard. We usually do work in groups where it's easy to run something by another group member — everyone is responsible for everything. I have been

the one to do the final approval of things, and though I had a good supervisor, she could not do the work for me (and nor should she). Since this has been the biggest project I have worked on so far, I wanted to fully understand the scope and questions, before throwing myself into it. I have had to acknowledge that that was not a feasible way to do it. I had to put things out into the world for them to bounce back to get an understanding of what I wanted to do.

Another challenge has been with participants. So many people have so much knowledge, but it can be hard to find the right way to invite them to share that knowledge. This was the case when I asked for 'magical moments with digital technology' online and invited a few to write design fiction about technology that would facilitate these moments.

During the project I have also come to the realization that I can not find the 'fundamental truth'. This need most likely stems from by background. The path to the final thesis you are now reading, has taken twists and turns I did not expect when I set out to explore this topic in February. It has been a challenge to keep going because at times it felt like I had no project or contribution at all. But like Bram Stoker wrote in Dracula: "We learn from failure, not from success!" (Stoker, 2008, p. 184)

1.3 Motivation

Though I have been studying design within humanities for almost two years now, I still somewhat see myself as the research scientist Christopher Fraying describes in 'Research in Art and Design' when commenting on how artists, designer and scientists are depicted in general/pop culture:

> The research scientist is orderly, he - again, it tends to be *he*, in popular images - has conjectures and hypotheses and he sets about proving or disproving them according to a set of orderly procedures. His subject exists outside himself, so he must submerge his subjectivity and personality in order to study it. He takes a problem, makes tentative conjectures regarding the answer to it and keeps revising the answer in the light of neat, well ordered experiments, which must be repeatable or replicable. He is what is known as a critical rationalist." (Frayling, 1993, p. 3)

My initial thought was to attack my topic like it is a binary search — small experiments that would be a little off until I hit the radiant treasure chest that is the mechanics of a magical interactions. That approach was probably a naive way to look at the phenomenon. Instead I ended up going down a path that looks at it in a more nuanced way; I can learn about it, find answers to some of my questions, but there is no *fundamental truth* to be found.

1.3.1 My background

I took my Bachelor's degree in IT Product Development at the department of Computer Science at Aarhus University. I did have design courses that expanded on the engineering approach and looked at people and how they feel, but it was still a Science and Technology degree. I had the idea that things fit in boxes and there are objective truths. Before my time at IT Product Development, I

studied a semester of Physics. I thought you could always find what is real and what is not, if only you dug deep and hard enough.

Within Physics we have atoms, which are made up of electrons, protons and neutrons. Protons are made of quarks; two Up quarks and one Down quark (things get a bit more complicated, when we go deeper than that, but there will be a scientific consensus on what that is eventually). The same logic works, but in the opposite direction, in astronomy. We have Earth, one of many planets and a part of a solar system, which exists with other solar systems in a galaxy. Galaxies are lumped together in galaxy clusters which are then grouped in superclusters.

That is a really nice way of thinking. The object truth is out there, we just have to look long and hard enough! Within Science and Technology, that is.

Things are different at Humanities. Here subjective experiences can be just as meaningful to look at and there might be more than one truth — there can be as many truths as there are people! All these truths might have something in common though and even if a service or product is developed to cater to one person's specific needs, it might be relevant and useful to other people as well (perhaps with smaller changes). IT Product Design has made me capable of building on the knowledge I already had and given me a way to reflect on processes. The process does not end with a finished concept or prototype. The knowledge you gain is not in those objects themselves, they are in the reflections on how you got there. This was of course also a practice at my Bachelor's — a failed prototype did not equal total failure — but at IT Product Design the reflections have reached an entirely new level for me.

This subjectiveness has inspired me to explore something that can be perceived as highly personal; thoughts, feelings and emotions that occur during specific interactions with different digital technologies. I see these qualities as highly relevant. Technology should do more than just work.

1.3.2 Inspiration

The inspiration for this project stems from an experience I had myself. The nuances might have been subtle, but it is as of right now, the best example I have (I will go into further detail and analysis of this experience later).

Briefly, I interacted with the voice assistant on my phone, Siri. With a specific question I had an idea that I could get the result I wanted, if I worded my question correctly, but based on experience, I did not expect to get the answer I was looking for — nevertheless I took a chance. To my surprise, I did get exactly the answer I was looking for. This interaction seemed magical to me, perhaps not life-changing, but magical in a subtle everyday kind of way. A bit like when you find a piece of candy in your jacket pocket; it was put there by yourself, but now that you stand at the bus stop in pouring rain and had totally forgotten about it and did not expect it, it is a pleasant surprise. There is a nuance to it beyond good/bad interaction. It has something extra — that *something* makes a big difference.

With the tools from my Bachelor's I did not have a way to describe it. I could probably have tried, but I am sure the result would seem flat and rigid. During my time at IT Product Design I have learned to appreciate the values of nuances in a different way.

Science fiction is something I have always found interesting. Movies and books of that genre is a vehicle to another dimension; sometimes it is a near future, sometimes another solar system, sometimes it is our own time, but in another and slightly different world with other rules and ways to think about technology. Nevertheless, it is a place to dream, to feel and to explore. Science fiction is capable of something special. It paints a picture and makes you think; it often makes you reflect on personal or societal dilemmas, like the surveillance in '1984' (Orwell, 1949) or the production of humans in 'Brave New World' (Huxley, 1932). These are things that might seem outrageous, but they are also close to the reality we live in. To me, this "other world but not quite" is fascinating. It lends a possibility to be in several places at once and like author George R. R. Martin has written: "A reader lives a thousand lives before he dies [...] The man who never reads lives only one." (Martin, 2011, p. 495)

1.4 What are magical experiences?

Oxford's dictionary describes 'magical' as follows[1]:
Magical
ADJECTIVE
1) Relating to, using, or resembling magic.
2) Beautiful or delightful in a way that seems removed from everyday life.

In this project I have made no distinction between the perception of magic (despite it being technology) and interactions that cause wonder (despite the technology being understood), since it in some cases overlap. It is not about deceiving people or making them skeptical of technology. It is about wonder and surprise. And it is about power, as Kim Binsted writes as she cites Arthur C. Clarke and explains further:

> Arthur C. Clarke's third law ("Any sufficiently advanced technology is indistinguishable from magic") is usually interpreted to mean that, to the average non-magical user, advanced technology is usable but not comprehensible. There is more to magic than incomprehensibility. Magic is about having power over the world around us, and the typical forms of imagined magic reflect the powers we would wish to have. (Binsted, 2000, Introduction, citing Clarke, 1999)

I agree with Binsted; there is more to magic than incomprehensibility. These magical moments often give us a feeling of control in a unexpected ways or surprise us with capabilities we did not think were possible. Just because something is incomprehensible it does not automatically make it magical.

But what exactly do these moments comprise of? When do they occur? These are some of the questions I have looked into during this project.

[1] https://en.oxforddictionaries.com/definition/magical

1.5 What can science fiction contribute with?

1.5.1 Into the unknown - Brandts Museum

An exhibition that ran at Brandts Museum from 28.9.2018 to 17.2.2019[2] looked at science fiction as a genre, which I went to visit as part of my preparations for this project. The exhibition covered science fiction in relation to politics, gender, society, transportation, robots and creatures/monsters. It had comic books, the helmets of Darth Vader and a Stormtrooper used in the movie from 1980, installation art, robots in multiple shapes and sizes plus lots of books.

To me the most important part was missing though: science fiction and technology. It was of course there in the sections about transportation and robots, but it was not as obvious as I would have liked it. Some writers, like Ursula K. Le Guin, writes science fiction almost without touching on technology at all. It is there, but never in focus. Personally I enjoy those stories as well[3], but for this project it is less relevant. One could say that my trip to the museum was a waste of time, but I would like to argue against that notion. I came with the intention to get inspiration on technology in science fiction. To me science fiction and technology were undeniably linked together and I was a little disappointed as I left. But what I have gained from it is how science fiction as a genre can also take on other focuses. My narrow perspective was widened and though it did not seem relevant to this project. I often find it useful to know which parts I do not want to work with as a way to figure out what it is I want to examine closer. It is all about opening a door to peer through it, before closing it and moving on.

1.5.2 Science fiction as a genre

The definition of science fiction is[4]:
Science fiction
`Mass noun`
Fiction based on imagined future scientific or technological advances and major social or environmental changes, frequently portraying space or time travel and life on other planets.

What science fiction can do (when it is done well) is to leverage the lyrical aspects of writing to create lively and captivating descriptions of people and their environment. In regard to this project, interactions between people and technology is especially interesting. Science fiction can, as per the definition, be used to describe future technologies. Things that have yet to exist or never will exist, can be described in great detail without being stopped by the limitations of the technology we have available today. This descriptiveness of science fiction writing can be used to look at the way we interact with technology in our day-to-day lives.

[2] https://brandts.dk/udstilling/into-the-unknown/

[3] What Le Guin has done for the the way we think think about gender in the mainstream is noteworthy. 'The Left Hand of Darkness' and the essay 'Introducing Myself' point out some interesting perceptions about gender and gender roles and even decades later they are still relevant and interesting reads.

[4] https://en.oxforddictionaries.com/definition/science_fiction

Science fiction is about stimuli, resonance and performativity. As Bruce Sterling writes in 'Shaping Things': "There is no danger of science fiction's pet gadgets becoming obsolete and disenchanting you. The tide of wonder never ceases for technologies that remain fantasies." (Sterling, 2005, p. 29) Science fiction will continue to cause fascination because the things that only exist on the page will never disappoint or feel out of date.

Especially the sub-genre of science fiction called cyberpunk has technology as a central point of focus:

> With this intensity of vision comes strong imaginative concentration. Cyberpunk is a widely known for its telling use of detail, its carefully constructed intricacy, its willingness to carry extrapolation into the fabric of daily life. It's favors "crammed" prose: rapid, dizzying bursts of novel information, sensory overload that submerges the reader in the literary equivalent of the hard-rock "wall of sound". (Sterling, 1988, preface xii-xiii)

This is exactly (part of) what science fiction can do. It can create an immersion in another reality, paint a picture of the imagined. Whether it is dystopian or utopian science fiction or a thing in between, we get to engage with different world views, perspectives and alternative (im)possible futures/realities.

1.5.3 Science fiction writers and (the technology of) the future

Science fiction and science fiction writers have used writing as a way to gain insights into the future. Some science fiction writers have been deemed able to predict the future as well. Isaac Asimov wrote in 1984 about what the world of 2019 might be like (Asimov, 2018). This prediction contains descriptions of how computerization will change the world and influence jobs, education and society as a whole.

Author C. Clarke wrote 'The Profiles of the Future' (Clarke, 1999) from which Clarke's three laws originated. They are:

1. When a distinguished but elderly scientist states that something is possible, he is almost certainly right. When he states that something is impossible, he is very probably wrong.

2. The only way of discovering the limits of the possible is to venture a little way past them into the impossible.

3. Any sufficiently advanced technology is indistinguishable from magic.

Especially the third law is of interest to this project. When does something become *sufficiently advanced* and how is this 'magic' expressed? When does it happen and what does it look like?

Science fiction is also of value to big technology companies. Microsoft has used science fiction writers to get a look into the possible future technologies in their Future Visions project (Bear et al., 2015).

All this is to say, that science fiction is not just something that happens in isolation. It has a value to companies and to society. It can be a rich source of

inspiration and knowledge. In this project I have used different methods to get a better understanding of these magical moments, one of them is design diction, which is heavily inspired by science fiction.

In the following chapters I will present the questions that have guided me through the process, my methods and approach, a look at the literature within this topic, what magical interactions are and when they occur, a reflection on the project and end with a conclusion. In between this, I have put the lovely narratives I have collected during the project. Because they have played such a vital role in my research, I feel they should be included in full length.

2

Research Question

The main research question for this project is:
How is the feeling of magic created in some interactions with technology?

To answer this I have three sub-questions that helped me get closer to an answer. They are:

1. How can these magical moments with technology be described?
2. What do people experience as magical interactions with technology? When do these magical experiences with technologies occur?
3. How can these magical experiences be explored through design fiction?

Question 1 centers around my own experience, whereas question 2 and 3 involve other people and their experiences and imagination.

A visual representation creating an overview of the project including the research questions and experiments can be found in Figure 3.1 under 3.7 Research Diagram on page 18.

3

Methodology

In the beginning of this project I was determined to find the *fundamental truth* about magical moments with digital technology (positivist paradigm), but during one of the first supervisor meetings it became clear that this truth is not discoverable the same way quarks or black holes are. This resulted in a paradigm shift from a positivist perspective to interpretivism.

Like Herbert A. Simon writes, "The natural sciences are concerned with how things are [...] design on the other hand is concerned with how things ought to be" (Simon, 1996, p. 11). That experiences with digital technology ought to be magical, is a design concern, not one of ultimate truths and natural laws. Since this shift in perspective I have tried to look at my questions from the paradigm perspective of interpretivism. This means the truth is subjective and that material (as opposed to data) is collected from an insider's perspective, rather than an outsider's (Jennings, 2010).

My original plan was to gather empirical materials with a series of smaller physical experiments but was changed to a narrative approach where the experience are described by people themselves.

3.1 Qualitative research

This naturally lead to the use of qualitative research methods, since these match with the perspective of interpreivsm and they fit within the chosen methodology. In the words of Brinkmann: "Qualitative methods throw light on the qualities of experiences, actions and emotions, whereas quantitative methods are used to chart the casual effects of independent variables on dependent ones." (Brinkmann, 2012, p. 19)

Quantitative methods are good at combining mathematical models with empirical findings, but can a magical experience be quantified? And more importantly, should it? The topic of this thesis is an experience, something felt and thought, it cannot and should not be quantified and put into numbers and thus quantitative methods are moot.

3.2 Phenomenology

My methodology is within phenomenology, the study of phenomenons and experiences. I have looked at this from a designers perspective, with the tools I have learned or discovered as a design student. I am interested in how the phenomenon of these magical interactions are experienced and when they occur. As put by Helene Starks and Susan Brown Trinidad: "In phenomenology reality is comprehended through embodied experience. Through close examination of individual experiences, phenomenological analysts seek to capture the meaning and common features, or essences, of an experience or event."(Starks & Trinidad, 2007, p. 1374). The process involved collection material, coding, sorting and clustering the findings in themes until a coherent description emerged.

3.3 Research through Design

My approach to this project has been that of Research through Design (Zimmerman & Forlizzi, 2014; Frayling, 1993). The goal is to gain a deeper understanding of these magical moments and thereby be able to build upon current design practices. I have used narratives and design fiction as means of inquiry into these moments. As with science fiction, the resulting knowledge from a research through design process should be seen as a proposal and not prediction (Zimmerman & Forlizzi, 2014; Zimmerman, Stolterman, & Forlizzi, 2010). Research through design has been combined with the use of inductive reasoning, which take observations (in this case two types of narratives), look at patterns and generate theory (Bernard, 2011).

3.4 Participants

The participants in this project have been invited to engage through social media and personal conversation. Since this is not a study of a specific target group, but a look at a certain type of experience, I have not set up any demographic criteria for participation. The participants had to be able to read and write in addition to having access to the Internet for practical reasons.

The participation has been twofold; the first part was a online bulletin board for real lived experiences of magical moments and the second was design fictions. Both will be explained in more detail in the sections 'Narratives of lived experiences' and 'Design Fiction'.

From the **lived experiences** I got 12 narratives from 11 participants (one participant wrote two entries).

> Phenomenologists are interested in common features of the lived experience. Although diverse samples might provide a broader range from which to distill the essence of the phenomenon, data from only a few individuals who have experienced the phenomenon and who can provide a detailed account of their experience might suffice to uncover its core elements. Typical sample sizes for phenomenological studies range from 1 to 10 persons. (Starks & Trinidad, 2007, p. 1375)

This number of participants fits approximately within the amount expected from a phenomenological process:

Later I gathered written **design fictions** which came to a total of seven stories from seven different people.

3.5 Methods

In this sections I will present the methods used and my approach to analysis of the gathered materials.

3.5.1 Research through narratives

The topic of this thesis, magical moments with digital technology, was not something I could just go out and observe in situ; they are ephemeral since they often happen unplanned and does not last for long. I have also come to believe these moments are not something I would be able to just replicate in the short four months of this projects without manufacturing something forced and artificial. What does a researcher do then? I have chosen to first look at my own experience and look at that in as much detail as possible and then have others describe when they have experienced magical moments with digital technology. I have also asked others to use their imagination and come up with 'magical technologies' including descriptions of how they interact with them.

My material thus consists of narratives written by myself and others. In the words of Susan E. Chase: "Narrative inquiry revolved around an interest in life experiences as narrated by those who live them" (Chase, 2011, p. 421). Here Chase mainly refers to the bigger experiences in life and society. Even so, it is still relevant in the case of this project; a magical moment is not the biggest and most influential thing of a persons life. However, to designers of digital technology, it is still relevant to understand when these moments occur and how they are experienced. Chase continues "[Narratives can be seen as] a meaning making through the shaping or ordering of experience, [...] of organizing events and objects into a meaningful whole" (Chase, 2011, p. 421).

Brinkmann describe the use of narratives in research as follows:

> [I]t has become a commonplace that the grand modernist narratives have become problematic, and instead we must look to our local, everyday modes of crafting small narratives to find the meanings that organise our lives - and the ruptures that disorganise them (Frosh, 2007). Qualitative researchers can learn much from fiction in this regard (Brinkmann, 2012, p. 5)

3.5.2 Narratives of lived experiences

I had an assumption that everyone experience these magical moments with technology. I wanted to know more about these (potential) stories so to gather the experiences, I set up a Padlet[1], which is a bulletin board with virtual post-it notes. I chose this platform because I wanted the participants to be able to

[1] https://padlet.com/pind92/MagicalExperiences

see what others had written; to get inspired and more willing to share their own story. It also required no sign-up and it would then have as low a barrier as possible. The participants post anonymously[2], but were asked to include their age. I wanted the age so it was possible to place them on a timeline of technological evolution; a home desktop computer or a smartphone might be experienced completely different depending on your age, since some people have used digital technologies their whole life ('digital natives') while others have to get used to it later in life ('digital immigrants) (Prensky, 2001). I did not see a relevance in having their names as I wanted them to be able to share and not worry about being judged in regard to the validity of their story (whether it was relevant or not), their skills of writing (creativity wise or grammatically). In hindsight it might have been a good idea to have a way to contact them with follow up questions. As it is now, the posts stand as small static stories and what is included was the details the participants found relevant[3].

The link for the Padlet was shared on Facebook[4] (both my personal profile, shared by friends and in groups), Twitter[5] and a couple of subreddits [6] on Reddit.com. People enthusiastically liked and shared the link, but in the beginning few contributed. When I saw some of the people who had shared the link in person, they told me they had seen/liked/shared the link. I asked if they had added to the Padlet themselves and almost everyone said they had a story, but did not really think it was "correct" or relevant. I encouraged them to add it anyway. In all cases they provided useful materials since they added a new aspect to the phenomenon. This doubt might have been a result of flaws in the study design and the invitation could be reworded to be more encouraging and explanatory. For future studies the invitation should be run by more than just a couple of people who already know what the project is about, before it is sent out.

3.5.3 Design Fiction

The gathered stories of lived experiences made the basis for a design fiction prompt, since another way to look at these magical moments, are by imagining them. How do people describe technology and interactions, if the only criteria are that they should feel magical and should use current or near future technology? This is a major resource that should not be ignored. As mentioned in 1 Introduction, science fiction authors have previously speculated on the future and the technology this will bring. This take is of course important to look at, but equally as important is what ordinary people can imagine.
This is where design fiction comes in.
The term was coined by Bruce Sterling and is described as follows:

> Design fiction reads a great deal like science fiction; in fact, it would never occur to a normal reader to separate the two. The core distinction is that design fiction makes more sense on the page than science fiction does. Science fiction wants to invoke the grandeur and credibility of science for its own hand-waving hocus-pocus, but

[2] Through conversations with people I have an idea of the authors of some of the posts.
[3] One of the stories does have a name on it since the author has a Padlet profile.
[4] https://www.facebook.com/kirstinegranzow/posts/2375416072503442
[5] https://twitter.com/Pind/status/1109043817938931713
[6] r/Thesissupport and r/SampleSize

> design fiction can be more practical, more hands-on. (Sterling, 2005, p. 30)

As mentioned by Larissa Naegele, Merja Ryöppy & Danielle Wilde, design fiction is a relatively new practice within research and design (Naegele, Ryöppy, & Wilde, 2018). No clear rules have yet been established for how design fiction research is conducted and in this project it is the miraculous in science fiction that is of focus. Not as a way to predict or imagine new technologies, but as a way to understand those moments we have that evoke a sense of magic. The design fiction narratives are used as a method of inquiry, to get a better look and a different perspective of these magical moments.

I wrote a design fiction prompt which was inspired in part by the one made by Naegele Ryöppy & Wilde (2018). It consists of a short introduction to the project, the writing brief (three scenarios) and some questions that could be used as inspiration, but were not mandatory. The prompt I gave to the participants can be found in Appendix A. It was shared on writetogether.space[7], Twitter and through personal contact.

3.5.4 Personal Experience

My own experience was the basis for my initial look at these magical moments. I used autoethnography to describe the experience and derive words for a tinkering session to make it more concrete and open to interpretation. This follows the argument by Chase that narratives can be used as a way to present material: "The goal of autoethnography, and of many performance narratives, is to *show* rather than to *tell* (Denzin, 2003, p. 203; Salaña, 2008, p. 201)" (Chase, 2011, p. 423).

Material tinkering was used to make this narrative physical and visual. Both the making of the objects and having a physical representation adds another layer to the understanding and the way the experience can be communicated. Tinkering is reflective conversation with material (Schön, 1992). Tinkering can also be seen as "an aspect of making involving playful, iterative exploration with materials and ideas" (Peppler, 2017) that functions as a way to explore more abstract concepts, in the case of this project, the experience of a magical interactions with digital technology.

3.6 Analysis

The online inquiries and the gathered design fictions are the basis for a text analysis. The analysis follows that of phenomenology:

> Interpretive analysis is an iterative, inductive process of decontextualization and recontextualization (Ayres, Kavanaugh, & Knafl, 2003; Morse & Field, 1995). During decontextualization the analyst separates data from the original context of individual cases and assigns

[7] Writetogether.space is a website with a community that aims to write more — a minimum of 300 words per day to maintain a daily streak. The users write what could be called blog posts; some about their daily lives, some with thoughts and observations and some with short stories of fiction. The specific post with the prompt can be found here: writetogether.space/posts/kirstine-granzow-larsen/writing-prompt-design-fiction

> codes to units of meaning in the texts. In recontextualization he or she examines the codes for patterns and then reintegrates, organizes, and reduces the data around central themes and relationships drawn across all the cases and narratives. [Phenomenological analysis] distill[s] textual data to a set of categories or concepts from which the final product can be drawn. (Starks & Trinidad, 2007, p. 1375)

Practically speaking, this was done using a similar process to that of Affinity Diagramming. This means the information is looked at from the bottom up by making clusters to find emerging themes and patterns within and across experiences (Hanington & Martin, 2012, p. 12 + 31). In this way the materials can go from insights to key themes that can be examined and synthesized and turned into findings. Aside form that, keywords from the lived experiences were used for a tinkering session. Snippets from these were also cut out and used to create a synthesis narrative.

3.7 Research Diagram

Figure 3.1 is a graphical overview of my thesis. This way to map out my process and the parts of the project is inspired by the paper from Thomas Markussen, Anne Louise Bang, Pia Pedersen & Eva Knutz on dynamic research sketches (Markussen, Bang, Pedersen, & Knutz, 2012) which builds on Eva Brandt and Thomas Binder's idea of mapping out the connection between the different elements in a research process (Brandt & Binder, 2007).

Though the diagram looks very linear, the process has been far from that. It is a simplification of a rather complex process where several things have run in parallel.

The circles in Figure 3.1 containing RQ0, RQ1, RQ2 and RQ3 refer to the different research questions, while the hexagons with X1, X2 and X3 represent the experiments that was done to explore and answer these research questions. RQ0 is the overall question for this thesis: 'How is the feeling of magic in some interactions with technology created?'
RQ1 is the question of how these magical moments with digital technology can be described, which was examined through a tinkering session.
RQ2 centers around other people's experiences of magical interactions. This was explored through personal narratives of lived experiences.
RQ3 is about how design fiction can be used as a method to examine these moments and was studies by asking people to write design fictions.

Even though the literature review might look static, it was continuously built upon and expanded throughout the project as it informed the process.

Science fiction worked as a constant inspiration and influence throughout the project, both in the shape of books, but also a visit to an exhibition on the topic at Brandts Museum. The knowledge gathered during the project has inspired the furthering of the process as well as resulted in an analysis and synthesis process that amounted to the contribution from this thesis.

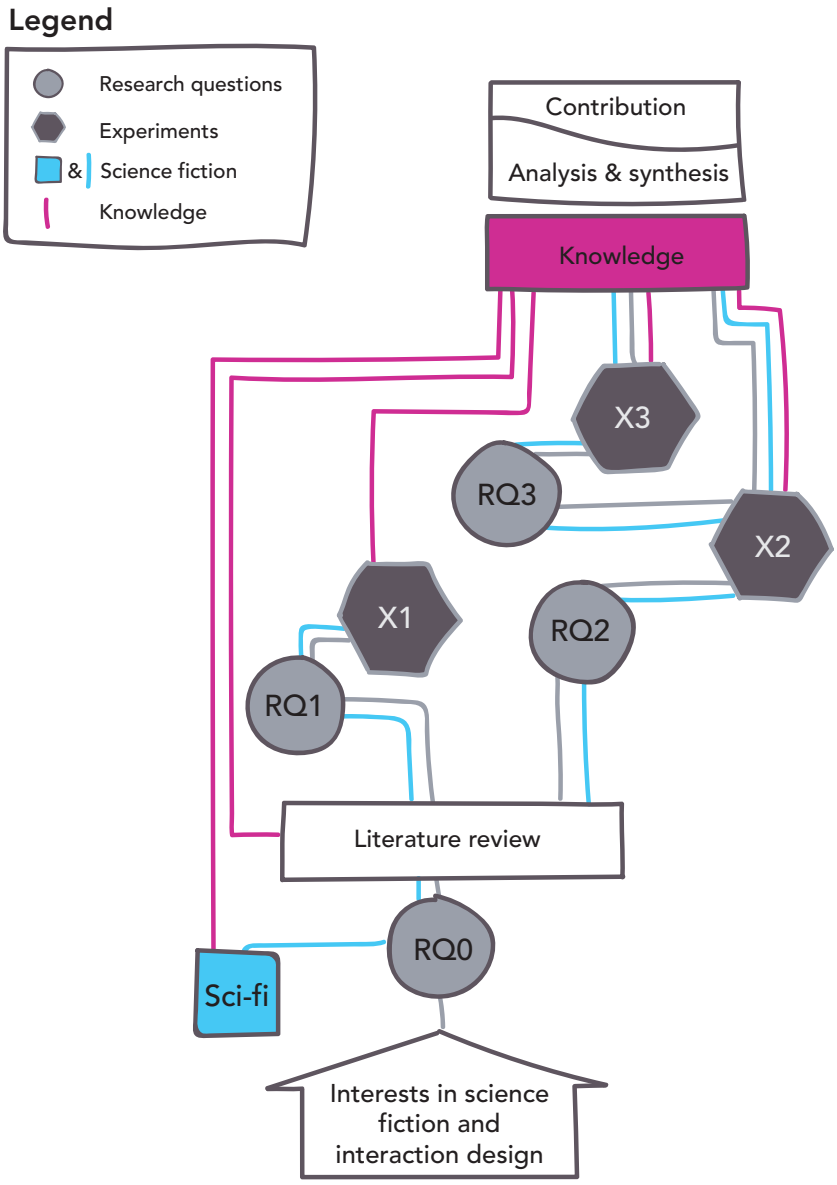


Figure 3.1: A diagram that illustrates the connections between the research questions and experiments and gives an overview of the thesis process.

4

Literature Review

There have previously been drawn parallels between magic and advanced engineering: "In Robert Heinlein's 1973 science fiction novel *Time Enough for Love*, Lazarus Long, a continuously rejuvenated man (hence his name) who lives from 1916 to 4272, writes in his notebooks, "one man's magic is another man's engineering.""(Grafton, 2005, p. 6) This falls in line with Clarke's third law which says that "Any sufficiently advanced technology is indistinguishable from magic" (Clarke, 1999, p. 3)

Within HCI, Douglas Engelbart could be called a magician during the demonstration of the 'oN-Line System' in what is known as 'The Mother of All Demos' from 1968[1]. Engelbart made a demonstration of a graphical window-based desktop with document collaboration and live video presentation *decades* before it became possible for consumers to do the same. What Engelbart and the team behind oN-Line System did was extraordinary at the time, but the technology used seems pretty normal now. I imagine the people who witnessed that demonstration felt the same way I did when I saw the movie 'Minority Report' ("Minority Report", 2002) for the first time. The way Tom Cruise's character, John Anderton, uses gestures of swipes and pinches to manipulate a video[2] to catch a "murderer" before the crime is committed was so fascinating to me. It seemed so effortless and was created in a way so it looks like John Anderton was a conductor of an orchestra. This interface was designed in corporation with researchers at MIT[3].

The combination of science fiction and (ubiquitous) computing is also something that has been explored. In 2014 Paul Dourish and Genevieve Bell wrote a paper where they did a comparison between ubiquitous computing and science fiction TV shows with a focus on the science fiction themes that can be found in academic papers (Dourish & Bell, 2014).

[1] https://www.youtube.com/watch?v=yJDv-zdhzMY

[2] It is a crime prediction previsualized by three people known as the Precogs and not a video recording of something that has happened already.

[3] A similar system to that from 'Minority Report' has been created so maybe this will be commonplace in the near future https://www.ted.com/talks/john_underkoffler_drive_3d_data_with_a_gesture?utm_campaign=tedspread&utm_medium=referral&utm_source=tedcomshare

4.1 HCI with magic as inspiration

In HCI, the concept of magic has been used as a source of inspiration on several occasions.

Dag Svanaes and William Verplank suggest that magic and paranormal phenomena could work as an inspiration for new metaphors within tangible user interfaces (Svanaes & Verplank, 2000). On a similar note, David S. Watson, Céline Mougenot and Chujit Treerattanaphan identified 13 principles in stage magic, which was then designed into eight products and tested up against equivalent products without these qualities. The small study found that the products modified based in these stage magic principle resulted in a more magical experience (Watson, Mougenot, & Treerattanaphan, 2014).

Another aspect of magical interactions are those that break the laws of physics and creates a sense that magic is at play. Majken Kirkegård Rasmussen presents Eugene Subbotsky's four types of magical relationships (Subbotsky, 2010) in the paper 'Magical Realities in Interaction Design' (Rasmussen, 2013). Here the magic happens when the laws usually at play in our reality is broken. The paper describes different types of products and interfaces where this is present.

In a paper by Berry and Daan Eggen, designers get inspired by the magical universe of Harry Potter to create Ambient Intelligent products (Eggen & Eggen, 2013).

The 'Magic Story Cube' is a tangible interactive interface used for storytelling (Zhou, Cheok, Pan, & Li, 2004). Though the word magic is used throughout the paper, it does not specify what it is that makes this story cube magic. They mention "Multiple modalities including speech, 3D audio, 3D graphics and touch are used to provide the user (especially children) with multi-sensory experiences in the process of storytelling." (Zhou et al., 2004, p. 364) but does not clarify if these are the things that make it magical.

4.2 Design fiction and magic as a design tool

Within design, the method of design fiction has been used to explore different possibilities and create dialogue.

The paper 'Anti-Solutionist Strategies: Seriously Silly Design Fiction' is an examples of how "magic machines" have been used to explore "techniques, which do not presume solutions or indeed critiques but instead create unuseless, questionable or flawed objects that can be used as starting points for conversations about alternative futures." (Blythe, Andersen, Clarke, & Wright, 2016, p. 4970)

Design fiction has also been used in combination with participatory design to give a voice to a specific group of vulnerable people (in the context of urinary tract infections) in the creation of future technologies to help them (Naegele et al., 2018).

Kristina Anderson has used "magic machines" as a way to explore possible technology with kids:

> By substituting the word technology with magic and machine we are opening up the query to reach beyond the adjacent possible to our current technologies, with magic referring strongly back to the well known definition by Arthur C. Clarke: 'Any sufficiently advanced

> technology is indistinguishable from magic' (Clarke 1984). Magic in this context refers to the desired not-yet-understood ability of future technology and machine to its embodiment and physical interface to the human user. (Andersen, 2013, p. 5)

Similarly, the OWL project gave people the opportunity to imagine technologies which are not currently possible with the use of probes strapped to the body (Wilde & Andersen, 2009). In the PhD by Danielle Wilde these questions are posed in regard to the project and show the possibilities if the actual technology is removed from the process: "What might the world look like if we fast track through the adjacent possible? Might we be able to bring into being a future predicated on magic and desire, rather than adjacent possible iteration / that which we already know?" (Wilde, 2011, p. 125)

4.3 Is magic always good?

When looking at magical technology, it is worth asking if magic is always good. Mark D. Gross and Michael Eisenberg argue, when it comes to kids' toys, "magical technology" is not optimal. Kids should instead be empowered to build their own toys to create an understanding of the technology available to them:

> The technology-enhanced toys described in this paper reveal, rather than conceal, their fundamental principles. By exposing the magic within we aim to intrigue and inspire a new generation of ingenious, creative, makers: in short, to educate a new generation of magicians. (Gross & Eisenberg, 2007, p. 7)

Rasmussen (in the paper on magical realities in interaction design) points out that magical experiences might not always result in a positive feeling:

> The question [Where is it useful to create interfaces that challenge our perception and expectations?] points to a need for understanding what the potential of applying magic as a source of inspiration and a way of interacting, as as well as for furthering the understanding of the relationship between technology and magic. Because while magic might provide a compelling source of inspiration for creating novel interface experiences, then the introduction of a breach in expectations is not unconditionally positive. (Rasmussen, 2013, p. 127)

In this project the focus is on the positive magical experiences, but I feel it is important to make it clear that it is not necessarily a positive thing in all cases.

4.4 Disney

Disney is the master of magic, like Susan Veness writes in a book about the secrets in some of the Disney theme parks:

> Some say [Disney's magic is] in the attractions, some say it's in the atmosphere, and some credit the can-do attitude the Cast Members.

> But nearly everyone who visits the parks agree: The magic is there; they just can't quite put their finger on where and like the magician, Disney's magic also lives in the slide of hand, the hidden detail. (Veness, 2015, p. 7)

Disney Research builds and explores new technologies that should work like magic. One of these projects is a magic bench that creates a mixed/augmented reality which does not require a headset. It consists of a mirror display in which a person can see themselves sitting on a bench and a digital character can be seen in the display and interacted with through the reflection. The presence of the character can be felt in the bench because of haptic actuators underneath it (McIntosh et al., 2017).

Another project is with a magic lens that can show different images from the same source image depending on how the lens is turned (Papas, Houit, Nowrouzezahrai, Gross, & Jarosz, 2012).

Disney has also used projection-based augmented reality to add some magic to their attractions: "The chief advantage of projection-based AR is that it can create beautiful dynamic environments and bring sets to life in a magical way difficult to achieve with traditional lighting." (Mine, van Baar, Grundhofer, Rose, & Yang, 2012, p. 33). The focus on magic in the Disney parks might just be why people visit again and again.

5

What is Magical Interactions?

In the following I will present an autoethnographic narrative on one of my own magical experiences and a material tinkering session that served to make this experience more tangible. This was done to create understanding of the incident and make me able to put more words on the experience other than just 'magical'.

Personal voice assistants have been a promise for many years as a smooth and integral way to keep track of calendars and calls as well as easy access to all the knowledge of the Internet. Back in 1987, Apple made a video showing a visionary concept with a digital personal assistant called 'Knowledge Navigator'[1]. So far the technology and the experience has not been as seamless as one could hope, but each year we get closer[2].

The experience of the magic that might occur when interacting with voice assistants has been classified as *Mind-over-matter* experiences by Rasmussen: "Another example [of mind-over-matter] is speech recognition software, which makes it possible to command the actions of the technology around us simply by talking to it." (Rasmussen, 2013, p. 27)

5.1 My magical experience

Personally, I have an iPhone 5s with the Apple voice assistant Siri. I can use Siri for setting timers when I cook and to call someone when wearing a headset while the phone is in my pocket. If I try something a bit more advanced I usually get the reply of "I found this on the web: *Do I have anything in my calendar tomorrow evening?*". That is not very satisfying and the experience is often followed by a sigh and me reluctantly tapping on the screen to manually get the answers I need.

A while back I had an experience that was very different to what I have gotten used to and I would say that was a pretty magical moment. At the time

[1] A video of the concept can be found here: https://youtu.be/hb4AzF6wEoc

[2] The 2019 Google I/O demo does get pretty close to Apple's concept video from 1987 https://youtu.be/TQSaPsKHPqs?t=1366

I was living with my aunt in Haderslev. One evening my aunt was visiting my grandmother. She called me to let me know she was leaving my grandmother's place and would be headed home soon. I wondered how long it would take before she came back to Haderslev and despite not expecting a very accurate answer (based on my past experiences) I asked Siri anyway. To my surprise Siri did not try to send me to the web or misunderstand what I had said, my question was understood and the reply I got back was useful! I was so amazed I took a screenshot (see Figure 5.1) and contemplated writing a tweet about my experience. This was what we had been promised by all the companies that make personal voice controlled assistants!

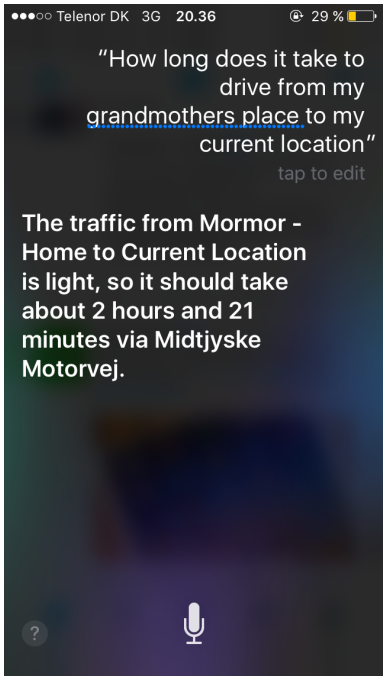


Figure 5.1: A surprisingly successful exchange with Siri

Sadly, I have not had a similar experience since and Siri still only understands what I say half the time, despite giving simple and specific instructions. But to me that just underlines the magic of that moment. If it was something that happened every day it would still be a great technological feat and a nice experience, but it would not have been magical in the same way — it would just be the norm. I had gotten used to the idea that this voice assistant would only understand and reply correctly a fraction of the time.

5.1.1 Breakdown of the experience

To get a better understanding of what exactly happened and to help build a vocabulary around these magical moments I have used tinkering as a method to create a deeper understanding.

What follows is an analysis of the interaction, a word collision and two tinkered objects.

First a breakdown of the exchange can be seen in Figure 5.2.

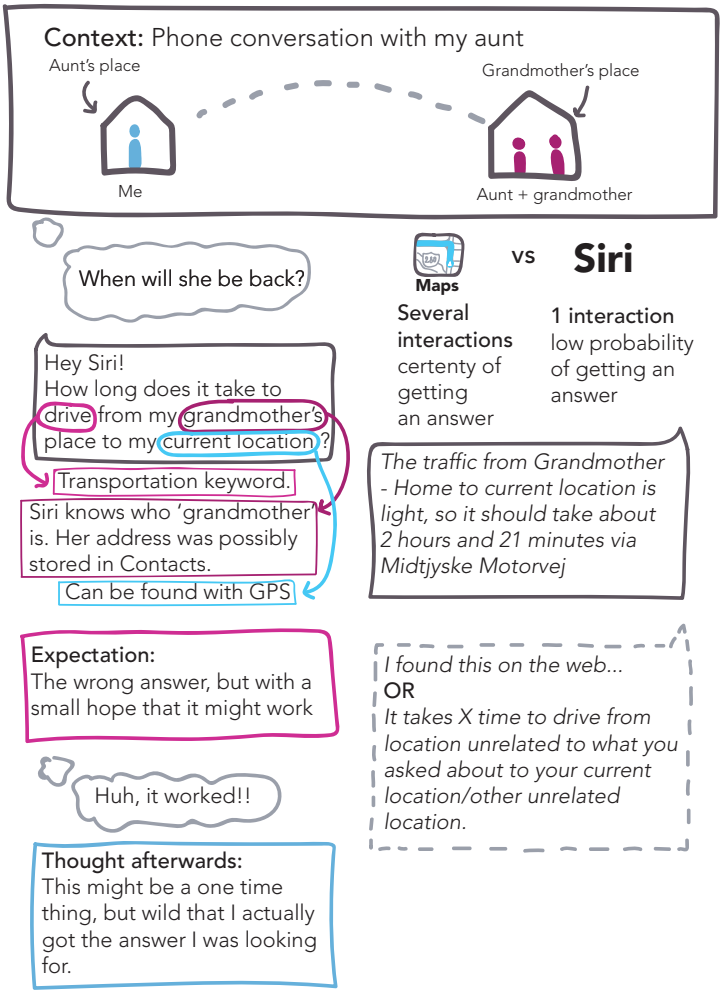


Figure 5.2: Analysis of the conversation with Siri

To get closer to a more expressive way of understanding this experience I made a list of words I associate with this experience. These words are: Anticipation, Success, Surprise, Ingenious and Satisfaction.

These words seemed fairly difficult to make into tinkered objects and associations to these words were found to make the task doable. Sometimes the first association needed yet another step to make it more concrete. Some of these associations are more visual than others. The words with associations can be seen below:

Anticipation

- Excitement
  - Bubbles
  - Rushing
- A knot in the stomach and a lightness in the heart

- A fork in the road

Success

- Levitation/floating
- Gold
- Shiny
- Light and happy colors (as opposed to dark earth tones)
- Smooth

Surprise

- Something hidden being revealed
- Expansion (Small → big)
- Lively
    - Movement
    - Explosion
        - Color
        - Loud
- Sphere

Ingenious

- Complexity solved
- Finesse/fine details
    - Something small as a part of something bigger
- (Thinking) outside the box

Satisfaction

- Soft (like fur + bendable/flexible + big curves)
- Warm
- Bright
- Deep
- Engulfing

I took two words, collided them and put them in a context that would mean I had to think of them in a different way; either *the sound*, *the smell* or *the taste*. That ended up in these slightly strange word collisions:
The sound of satisfaction surprise
The taste of anticipation success

The purpose of these word collisions is to make me able to interact with them in a new way in a material tinkering session. The taste of e.g. strawberry is known, but how would that be visualized? What if it was the taste of something that does not have a taste to begin with? What would that look like? It becomes a negotiation between my own imagination and available materials.

5.1.2 Tinkering session

These two word collisions became the basis of a tinkering session.

Tinkering is a conversation with materials, reflections and images in the mind. The goal for the session was to make these word collisions tangible and by that, have a new basis to talk from.

The session setup can be seen in Figure 5.3.

The finished objects can be seen in Figure 5.4 & Figure 5.5.

Following is a walk-through of the two objects and part of the process of their creation.

Figure 5.3: Setup for material tinkering.

Figure 5.4: The tinkered object for *The sound of satisfaction surprise*.

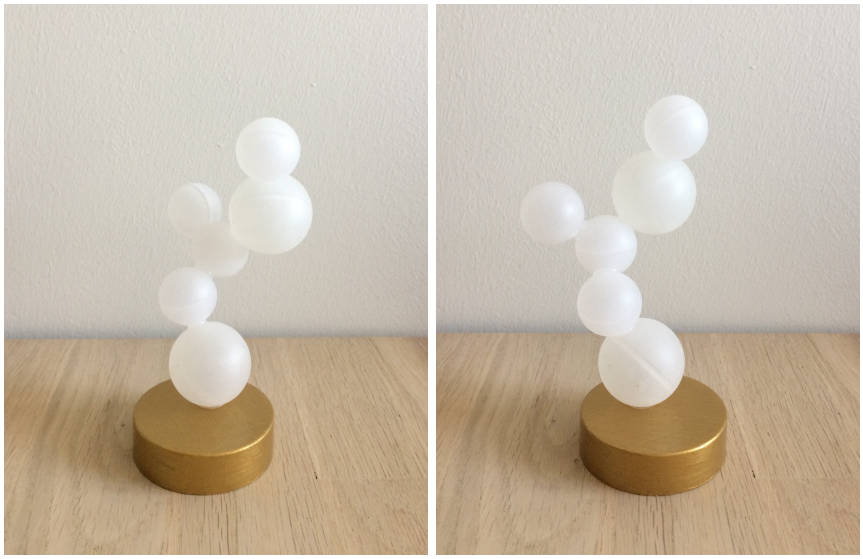


Figure 5.5: The tinkered object for *The taste of anticipation success*.

5.1.3 The sound of satisfaction surprise

'The sound of satisfaction surprise' was the first object to be made. I wanted to create the sense of surprise by having something which was hidden and could then be revealed — this was achieved by taking a small metal tin and conceal something inside. The feeling of turning it over to see what was inside felt right[3]. The inside of the tin is a small explosion of glitter and 'floating' dots of color. I imagine the sound of surprise starts small and then expands rapidly to something big and loud; not an unpleasant loud, it still needs to be satisfying. The expression had to have a softness to it as well. I wanted the clingfilm used to suspend the beads in the explosion to fit just inside the edge of the tin as to not ruin the surprise or give anything away before it was turned over. The bottom is covered in sparkling white beads which also adds a nice weight to the object that almost encourages the person holding it to turn it over. I wanted the outside to be soft and clean. To begin with I had used some blue silk (see Figure 5.6) but there was something about the color that did not fit. It has to be a warmer color, since the blue was too sharp and the sound of satisfaction is like a warm hug to me.

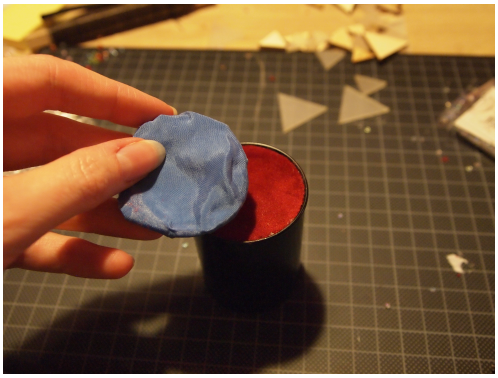


Figure 5.6: Testing a blue silk material for *The Sound of Satisfaction Surprise*.

After finding the right material, a soft red velour, I felt the outside was still missing something. I imagined something with big soft curves, but I could not get the material I wanted, nor the qualities I was after. I tried with paper, first some slim strips that swirled from the bottom (the opening) to the top (the red fabric) and then a paper ring parallel to the circle of red (see Figure 5.7), but nothing looked or felt very satisfying.

The bubble wrap had a good feeling to it, but cheapened the look — again, not very satisfying. As seen in Figure 5.4 the final choice was a tea filter that was cut to fit the size of the tin. It still had a nice tactile feeling and a bit of warmth, like the bubble wrap, but did not feel cheap in the same way. Throughout the process with this object it always seemed like it missed something. Some detail I could not find materials for or even the right words to describe it. Something it missing from it to truly make it an embodiment of 'The sound of satisfaction

[3] A friend of mine saw the two objects standing on my table, when she came over for a visit. She took a look at the objects and as she turned over the little tin, she exclaimed a delightful "Ooooh!" when she saw what was inside.

Figure 5.7: Testing shapes and materials to be added to *The Sound of Satisfaction Surprise*.

surprise', but that can also be seen as a quality as it still enables me to get closer to a description.

5.1.4 The taste of anticipation success

The second tinkered object was 'The taste of anticipation success'. I tried to manifest the taste in my mouth and reflect it in the choice and composition of the materials. I wanted the object to look tasty, but not edible. For the 'anticipation part' the thing I especially focused on was a bubbling sensation and something that could split (like a fork in the road). The stacking of the plastic balls give the object a sense of balance or achievement and fragility at the same time. It has an upward energy while being grounded in something solid. Around halfway up it splits, with one side being bigger than the other. This symbolizes the two outcomes of anticipation; success and failure. It is a very binary way to look at an outcome, but I wanted the feeling of two opposite possibilities to be clear. The gold color comes from 'success' and has a weight to it. I wanted the gold color to be as saturated and shiny as possible, it had to be pure and not just like golden flakes thrown on top of a fancy dessert. The gold base is both soft, hard, warm and cold at the same time. I imagined taking a bite of it would be both hard, like hard chewy candies, while also soft and melting, like hazelnut spread. A bit like the properties of potato starch mixed with water; high impacts leave it hard, but slow and patient touches let your fingers sink into it. The contrast of the matt white and gold makes the balls look even more like bubbles and the whole thing has the appearance of a statuette from some kind of award show — the ultimate appraisal of success. I tried to "sprinkle" some thin stripes of colored tissue paper on it to give some more "taste" to the success, but it ended up looking cheap and worked against the overall elegant feeling of the object and so it was left as it can be seen in Figure 5.5.

5.1.5 Discussion

So what can be gained from making this tinkering exercise? It is easier to describe something if you have a reference point. Making the feeling of my magical

moment physical, turns something very abstract into something concrete. I have not learned everything there is to know about magical experiences with this exercise, far from it, but it has given me more words than just 'magical'. Now I have two physical objects, I can hold them in my hands and describe qualities of them while at the same time describing the qualities of my magical interaction.

These moments are about reaching a balance, they are temporary and though they do not last long, they make an impact. They are almost like a reward, something that has been unlocked albeit just for a moment. For me there was anticipation — the interaction could go two ways; success or disappointment and failure. Not a big kind of anticipation, it was not like waiting for a test result or a present on Christmas Eve, but it was there and the result was surprising. There is a curiosity to it; How and why does it work? There is an element of exploration and discovery, which can be seen in the surprise of turning the tin over. It is not something that can just be recreated by repeating the same actions. The magic in that specific command is gone. That said, I have had Siri since she was integrated in iPhones and that magical moment happened after 4 years, so it might be possible I have a similar experience if I discover something new. I do not see a point in chasing it though. I would have to have so many disappointing interactions (I do that on a daily basis) and the surprise would not give the same sense of discovery if I systematically sought it out.

6

When Does Magical Interactions Happen?

6.1 The opposite of magic

Before getting into when these magical moments happen I want to take a look at *what it is not*.

The opposite of magical moments are when things somehow go wrong. In the following three sections I will first present a theoretical background for what happens in the case of the opposite of magic and then two different stories of examples.

6.1.1 Breakdown

Philosopher Martin Heidegger[1] introduced the concepts that objects can be present-at-hand or ready-to-hand. In 'The Things That Matter' Peter-Paul Verbeek and Petran Kockelkoren describe it with an example of using a hammer:

> When everything is working properly, they are ready-to-hand. Absorbed into our everyday dealing with the world around us. [...] When hammering, our attention is not directed towards the hammer but towards the nail we want to get into the wall. The hammer, in a certain sense, withdraws from our relationship with the world. But when something goes wrong, for instance, when the hammer breaks in two [...] it suddenly is not ready-to-hand anymore, but becomes present-at-hand. (Verbeek & Kockelkoren, 1998, p. 39)

Verbeek and Kockelkoren later writes that "The intentionality of technological objects, as it were, enters the relationship between people and their world." (Verbeek & Kockelkoren, 1998, p. 39) In this way the object or device becomes a mediator and as Binsted said: "Magic is about having power over the world

[1] I find it important to point out that Heidegger was a member of the Nazi Party and held opinions that conflict with those of my own. In the case of philosophy, it can be hard to "separate the person from their work", which is why I want to make it clear that I understand from when in time and under which political circumstances these terms were created.

around us"(Binsted, 2000, Introduction) So when a breakdown occurs, we lose the power that this object enables us to yield.

Below are two examples of digital technology that becomes almost painfully present-at-hand.

6.1.2 Bad design

A badly designed product can result in very un-magical experiences and disappointment. In 'Designing Interactions', Bill Moggridge writes about an encounter with a disappointingly designed digital product; a digital watch with an alarm and built in radio. Moggridge described the first impression of the watch as "[A]mazingly small for all that functionality." (Moggridge & Atkinson, 2007, p. 4). As it turns out, the radio, which had a small earpiece attached by a delicate cord, was of poor quality. On top of that, it took Moggridge 20 minutes to set the time and an alarm for 5 o'clock while following the instructions that came with the watch. Six weeks later the alarm was no longer necessary and due to daylight savings time it went off at 4 o'clock. It had been six weeks since the instructions had last been used and they had disappeared in the meantime. It was not possible to set the clock without the instructions Moggridge notes: "Why did the digital watch have four buttons, and a sequence of operations that was too complicated to remember?" (Moggridge & Atkinson, 2007, p. 5) Despite trying to turn the whole watch off by removing a battery, it still woke up Karin Moggridge, Bill's wife, and the second "morning" this happened the problem was solved with a hammer. (Moggridge & Atkinson, 2007, pp. 3-6)

This small story by Moggridge is a classic example of how digital technology sometimes is more complicated than it should be. The explanation for the watch — the many buttons and hard to follow instructions — as given by Moggridge is because of a catering to the computer chips inside.

This is an example of what happens when a device has been *built* rather than *designed* with an end user in mind.

6.1.3 Wrong understanding

The wrong understanding of how something works can also lead to much frustration and be the opposite of magic.

My sister is, in my opinion, a very bright and intelligent young woman, but when it comes to computers, there is space for improvement. Sometimes a little too much space. It is not because she is unable to use a computer at all, but I would compare it to how most people (including myself) do not "speak" printer. Sometimes things go smoothly, but when they do not, it can be very frustrating, especially if you have no clue why the machine does what it does.

A few years ago my sister had to reformat her laptop because it had become very slow and all other ways to clean it up had not made a big difference. She copied all the important files she wanted to keep (documents and pictures) onto an external harddisk. She made sure the files were there by disconnecting and reconnecting the external harddisk and saw they had indeed been copied. My mom asked if she was sure they were copied correctly (like mothers do) and my sister said, slightly annoyed, yes, that she had double checked. Then the reformatting was set in motion and everything went as it should. After everything had been wiped and the laptop rebooted, my sister connected the

harddisk to get all her files. To her disbelief the folders she had then copied onto her now completely cleared laptop gave her an error that told her the files could not be located. It turned out she had copied the shortcuts to all her files and not the files themselves. When she had checked the files from the external harddisk, the paths to the material still existed and all the photos and documents looked like they were all backed up. That meant all her things had been permanently deleted[2]. She learned a very expensive lesson on how folder shortcuts work that day.

Now that I have covered when the opposite of magic happens, I will go into when magical experiences can happen.

6.2 Magical realities

The causes for a magical moment can be many. One area of these can be when the technology breaks the laws of physics and create magical realities. This has been examined by Eugene Subbotsky in the book on 'Magic and the Mind' (Subbotsky, 2010) and summarized in a 2013 paper by Majken Kirkegård Rasmussen. Four types of magical realities are presented in the paper, (Rasmussen, 2013), they are:

Mind-over-matter magic
Mind-over-matter is when technology makes something possible that would normally be a breach in the laws of physics. EEG technology (measurements of electrical activity of the brain) and speech recognition/voice assistant software fall into this category.

Animation magic
Animation magic is when objects behave differently from what we expect in an animated way. Rasmussen mentions shape changing interfaces. One example of this, is a project Rasmussen worked on called coMotion which is a bench that changes shape when people sit on it (Grönvall, Kinch, Petersen, & Rasmussen, 2014).

Nonpermanence magic
In our physical reality, we have rules that govern the things that surround us. They can not defy gravity or Newton's three laws of motion[3] or come into and disappear from existence suddenly. Nonpermanence magic is when technology enables this.

Sympathetic magic
Sympathetic magic is when we experience a disconnect between our rational thoughts and actual actions. That one object can be "contaminated" or influenced by another, despite it not being the reality.

[2] Through different kinds of software programs most of the pictures and some of the documents were recovered.

[3] **First law:** In an inertial frame of reference, an object either remains at rest or continues to move at a constant velocity, unless acted upon by a force. **Second law:** In an inertial frame of reference, the vector sum of the forces F on an object is equal to the mass m of that object multiplied by the acceleration a of the object: F = ma. (It is assumed here that the mass m is constant) **Third Law** When one body exerts a force on a second body, the second body simultaneously exerts a force equal in magnitude and opposite in direction on the first body. ("Newton's laws of motion", 2019)

These four types of magic covers the magic that breaks with the natural laws and our expectations of these.

I have tried to fit the narratives I have with these four types of magical experience, but aside from my own story with Siri (mind-over-matter) and a lived experience with a Wii console (nonpermanence), they do not match any of these four types.

Luckily I have science fiction as a tool for this project and in the next section I will map out my way of classifying the different experiences with digital technology.

6.3 Science fiction and magical technology

Reading science fiction has allowed me to look at technology in different ways. My initial thought was that all interactions with digital technology are basically the same; you have a device of some kind that you physically interact with and through this interaction the magic happens. This way of looking at it was changed when a friend and classmate recommended me a short story; Kurt Vonnegut's 'The Euphio Question' (Vonnegut, 1951). The short story is about a couple of scientists who find a radio signal from somewhere in deep space. When this signal is rebroadcast it creates a sense of pleasure, a feeling of euphoria, in anyone close enough to hear it. The focus here is on the effect — the technology itself or the physical device is not important. The interactions with the device are basic; there is a volume knob while the device itself is described as merely a gray steel box that is connected to the phone line with two jacks. It is not the device itself, but the effect of the technology on humans when turned on. So the device itself is boring and the focus is on the effect. The magic is done *by* the device.

After this realization, I started to reflect on how technology is presented in other books and I came up with a table bit by bit that describe technology in science fiction and how the magic occurs. This can be seen in Figure 6.1.

The way Becky Chambers casually introduces technology that we (the reader) do not have access to in 'Record of A Spaceborn Few' (Chambers, 2018) is magical to me. The descriptions are clear enough for me to be able to imagine it, but not so much it seems over explained or predictable — it has that special kind of curiosity to it. As on page four, when a small kid wants to go on an adventure to see the stars on her own:

> 'And when do you get off it?'
> 'When it gets to the bottom.'
> 'When it *stops*,' Tessa said. It wasn't hard to picture her daughter jumping off while still in motion. 'You have to wait for the bench to stop *all the way* before getting off of it.
> 'Okay.'
> 'What do you say if you fall?'
> 'I say "falling!"'
> Tessa nodded. 'You shout real loud, right? And what does that do?'
> 'It makes... it makes the... it makes it turn off.'
> 'It makes what turn off?'
> Aya bounced and thought. 'Gravity.'
> 'Good girl.' Tessa tousled her kid's thick hair with approval.

'Well, all right then. Go have fun.' (Chambers, 2018, p. 4)

Similarly, when two archivists have to document what is going on during a chaotic disaster:

> 'Get the cams out,' she said. 'Start recording.'
> Her colleague gestured at his scrib and opened his satchel, and the camera spheres flew out, glowing blue as they absorbed sight and sound. Isabel reached out and tapped the frame of the hud that rested over her eyes. She tapped again, two short, one long. The hud registered the command, and a little blinking light at the corner of her left eye let her know her device was recording as well. (Chambers, 2018, p. 6)

Chambers has the focus on the actions and interactions around the technology (not a detailed description of the device itself). This creates a sense of curiosity, you want to know more, to figure out what these things are capable of. While not letting the reader know everything, but just enough to follow the narrative, the interactions and actions are of focus. The magic here happens *around* the digital technology.

In William Gibson's 'Neuromancer' (Gibson, 1984) the characters get jacked into cyberspace. In a similar, but not as risky, way the characters in 'Ready Player One' (Cline, 2011) use a Virtual Reality device, that at first is just a headset and a glove and later a full-body rig. Both functions as a portal to the focus point of the story — a virtual world. The interesting part happens *through* the technology in a way that the technology functions as a portal or vehicle.

The three ways to look at technology can be seen in Figure 6.1. Later, I will use this way to look at technology to map out the narratives I collected from my participants.

The device and interaction is...	The focus	Keyword	Examples can be found in:
Boring in itself	The effect	By	The Euphio Question (Vonnegut, 1951)
New and interesting	The interactions and actions around the device	Around	Record of a Spaceborn Few (Chambers, 2018)
Made of known technology, but is more advanced	The device becomes a vehicle, a portal	Through	Neuromancer (Gibson, 1984) & Ready Player One (Cline, 2011)

Figure 6.1: Overview of three ways to look at technology.

6.4 The two types of narratives in my research

6.4.1 Personal lived experiences

As mentioned in 3.4 Participants, I got 12 stories about magical interactions with digital technology from 11 participants on the board at padlet.com[4], which can be seen in Figure 6.2. The first story posted, 'Floating Earth', was put there by me to take the pressure of the first person who wanted to post and is not counted or included in the analysis, but can still be found in the collection of narratives. It could have been included in the analysis, but for this part of my research I wanted to examine other people's experiences. I will highlight a few stories and use quotes as a way to present these stories, but all the stories can be found in Chapter 7, if you want to read them as they were written (I think you should, they are all interesting in their own way).

Figure 6.2: The personal lived experience collected on padlet.com

[4] https://padlet.com/pind92/MagicalExperiences

6.4.2 Design fictions

The seven design fiction narratives created based on the writing prompt (see Appendix A) can be found in their full length in Chapter 8. I will use quotes and references in my analysis, but for the full context, the stories should be read. If reading all of them is not desired, I have made a short summary here[5]:

Dream recorder
'Dream recorder' is a story about a product from Kickstarter, called DreamZio, that can capture the dreams of the user in the shape of 640 x 480 pixel stills and sound clips. The story described the setup process and what the product can do.

iBird
'iBird' tells the story about the next generation of smarthome assistants. It can seamlessly connect with all the electronic devices in the home like thermostat, smartlock, alarm system, TV and smartphone. It has a built in camera and flies around the home. It can even make sure your house plants survive while you are on vacation.

For the 'Gram
This story takes place in 2049, where humans are building a new home on Mars. It includes a home-computer called Minerva and other connected devices, but the main focus is on a holographic communication device that can connect old friends over the distance between Earth and Mars so important life-moments can still be shared.

The packet
'The packet' centers around the unboxing and assembly process of a modular and sustainable smartphone.

Phone case
'Phone case' is the story about a smartphone case that is supposed to reduce screen time. It does so by slowly heating the cover (while keeping the phone itself cool) to temperatures that mean you have to put it down. The longer you look at the phone, the hotter it gets.

Notebook
'Notebook' involves the unboxing and use of a new digital notebook and pen, which is very focused on the materiality of it. The notebook and pen is the perfect mix of analog and digital.

Rat translator
What if you could understand what your pet was saying? This story is an exploration of that. The device here can translate the sounds from two pet rats into words. The more the device knows about the rats the more advanced it gets, just like it gets better at translating over time.

[5] In case the narrative did not have a title, I picked one based on the device described in the story.

7
Lived experiences of magical interactions with digital technology

13 short narratives
by
12 people

Magical interactions with technology

Hi there! I would like some help for my thesis. Write a description of an interaction with a device or piece of digital technology that you found magical in some way — it can be anything from a toaster or a doorbell to a voice assistant (like Siri or Alexa) or a self-service machine in the supermarket. The more details, like your thoughts or feelings, the better. Please add your age in the end of the post. Thank you! 💖

KIRSTINE GRANZOW LARSEN MAR 21, 2019 11:46AM

ANONYMOUS APR 12, 2019 08:09PM

Magic turtles in Walt Disney World

A couple of years ago I was in Epcot (Disney World) in Orlando. I was there with some family, including my young nephews who were about 6 & 2 years old. We went into one of the attractions where you meet one of the "groovy" turtles from Finding Nemo.
It's on a giant screen and it talks to people as the crowd is moving into the room, saying generic stuff and talking about turtle facts.

As time goes by, it starts getting more and more specific. It's almost like it's looking directly AT some people. And it starts going into specifics, like "You in the green jacket...". I couldn't see if there actually was a guy in a green jacket, so I thought it was simply a cleverly designed video.

After a couple of minutes more, the turtle says "Now, does anybody have a question?". And somehow, someway it's actually a rendered turtle, controlled by an operator SOMEHOW.
I don't know how, but the way it moved its lips was perfectly accurate with what it was saying. The turtle could also swim around and up and down and do flips, and even swim out of frame. It could even do grimaces. One kid asked "Do turtles need to breathe above water?", and the turtle answered "Yes". After a few seconds of looking stoned, it suddenly grimaced surprise and immediately swam up out of frame to draw breath.
It could also look directly at people in the room, keeping eye contact as it swam around.

To this day, I have no idea how 1 man could control so many things at the same time. The guy was extremely funny too, so he might not even have been tech-savvy. But everything was in perfect synchronicity all the time.
The kids in the room and my nephews thought nothing of it, but I was completely dumbfounded.

BEATRIX IVICSICS APR 12, 2019 10:44AM

Wow-factor

After not being in my home country for a while, the first time when I got to try out the newly released ticket-vending machine(for public transportation) using touch-screen entirely changed my perception of using the whole public transportation system!
I just got to the machine, tapped the screen a couple of times and in no time I found myself holding the right ticket, exactly what I wanted without any hassle, unnecessary confirmation questions, overwhelmingly many options etcetc.... and my mind was completely blown how easy, quick and smooth it can be to buy a ticket. Honestly, ever since I have been banging on this experience to everyone I could. Interacting with a machine made for serving the public can be magically easy. :)

Age: 30

ANONYMOUS APR 04, 2019 09:20AM

Something new

For me, the is almost always something magical or rather whimsical about new things. Opening the box for the first time, seeing everything neatly packed inside, be it a headset, coffee machine or game console. Some object also comes with a distinct smell when new (headsets, books, anything with foil on that can be peeled of). Giving the object an unfamiliar smell which keeps impressing on one until you get used to it or it fades with use. The first times using these objects feel magical, it's something new and exciting.
Notable examples:

Using my first 'real' coffee maker. Shortly after receiving it as a gift, I began using a Mocca Master to brew coffee. Every new interaction with it was special. Taking the glass pitcher and filling it with water, pouring the water into the machine
d measure the amount. Inserting a filter in the cone and
pecially opening a box of grounded coffee beans and
ooping it up with a small spoon, into the cone. Turning the

machine on and immediately hear it beginning to boil water and seeing the drops of coffee slowly starting to fill the pitcher. The whole interaction was a whimsical experience and still is, at least for a while.

I think the magical or whimsical experience comes from having something new arrive to interact and influence me. An object or technology I am not used to and is free to explore the new impressions I am receiving from it.

ANONYMOUS APR 01, 2019 10:46AM

Nintendo wii

First time I used a Wii (I might have been around 12-15 years) I thought it was very cool that I without a wire could play games in front of a screen, and that it could detect where I was.
Age: 24

ANONYMOUS MAR 27, 2019 09:00PM

Drawing Tablet

The first time I was able to use a Wacom drawing tablet, my whole world was just expanded with happiness. I was probably 11 or 12 and an artist (drew on everything, all the time) and I was giddy with how cool it was that I could now draw digitally and use digital art tools. I still think it's amazing what people can do with art programs, and the tablet was one of the best gifts I've ever gotten. It felt like I had gained another limb or way to interact with the world, especially with artists online who were pioneering and continuing to pioneer new digital techniques.

Current age: 26

ANONYMOUS MAR 27, 2019 10:05PM

Gaming PC

The first time I got a gaming PC and could play PC-games was a magical experience for me. It was so immersive, I felt like an entire new universe with hundreds of different stories, worlds and friends were hidden right behind the screen, waiting for me to throw myself into the experience. That first time I opened up a game and saw the prologue to an epic story, with the sound of music and voices from the characters booming in my ears....Wow. For several moments I forgot everything about the real world and was just a part of this exciting virtual reality where magic was real and I was the hero - that was magical. Age:26 Gender: Female

ANONYMOUS MAR 25, 2019 04:28PM

Auto volume control

If you are listening to something in a Tesla and you open the door. The music doesn't stop playing but it does drop the volume automatically so as to not blare out around the vicinity of where you are parked. Close the door the volume resumes.

It didn't notice this the first few times and then one day I did. Afterwards I thought, of course that is the obvious thing to do but somebody had to think of it. I haven't been in any other car that does this.

It's the little things, the attention to detail. The sign that the designers of the product use it themselves and fix the annoying things, even if marketing can't sell them and product managers won't authorize them. They are the causes of delight for me.

56 but never got past being 25.

ANONYMOUS MAR 24, 2019 10:38PM

Adobe's first Demo of Content-Aware Fill in Photoshop

I remember first seeing the demo of Adobe Photoshop's Content-Aware Fill -- this is the now-common feature that lets you, under the right circumstances, seamlessly remove or move objects -- and it was absolute fucking magic. It still is, when it works.

Age: 30

ANONYMOUS MAR 24, 2019 10:38PM

The first time I saw a Kindle

Kindles and e-readers are commonplace nowadays but I remember seeing one the first time and I was like, huh, it *does* look like paper. I had to see it to believe it.

Age: 30

ANONYMOUS MAR 23, 2019 09:38PM

Well, I am a huge Apple fan and I find (almost) every Apple product magical. It's like a technological friend who is there for you 24/7. The first Apple product where I experienced a slight magical feeling, must be my Apple TV. Beatiful design both software and hardware, fast, user friendly and was capable of screen-sharing my iPhone - so I could show my pictures on a 50 inch Ultra HD TV.. Furthermore is the MOST magical experiences with my iPhone X. Fantastic quality all around and has the magical power of face scanning. It's a very secure and amazing feeling that it only opens when my face is scanned. We've come so far in development and the iPhone X stands perfectly on the top. Apple delivers magic and is worth every penny everytime.

ANONYMOUS MAR 23, 2019 09:38PM

My grandfather was an inventor and held hundreds of military patents. He never graduated high school but developed guidance systems for rockets... When I was younger he'd make things for me as birthday gifts. When I was about 6 years old (1988) my parents brought me over so he could give me my gift. He pulled out a remote control from a large cardboard box and extended the antenna. In from the other room a remote controlled tank the size of an RC car comes rumbling in. He had built it just for me. The tank smoked and fired rubber pellets. He told me to look down the barrel of the turret on top of the tank and then proceeded to turn on his large ancient TV. It was one of those large wooden paneled TVs that sat on the floor. The tank wasn't connected to any wires, yet on the TV was live wireless video of me looking down at the tank. My mind was completely blown. It felt unreal. I didn't believe what I was seeing. This was the late 80's, so even a remote controlled car seemed high tech. I assumed everyone had this technology growing up. He gave me a large receiver that would connect to my TV at home. For years I made new friends because they wanted to come over to play with my tank. Years later after I grew up he explained how it worked and that if the government knew he'd made that for me he could've gotten in trouble. It apparently used technology was classified. Here is me on the day I got the tank.

ANONYMOUS MAR 23, 2019 09:36PM

Jesus Christ

One time my cousin and I were driving in Brooklyn (back in 2004 or 2005) and we started to pray to Jesus that we would make it to our destination (jokingly, because we are both atheists, but her car was very unreliable) and the MP3 player on shuffle randomly started playing "The King of carrot Flowets, Pts. 2-3" by Neutral Milk Hotel. Opening lyrics blasting through the speakers: "I love you Jesus Christ, Jesus Christ I love you, yes I do". We made it to our destination.

Age: 40 — **ANONYMOUS**

ANONYMOUS MAR 27, 2019 10:05PM

Floating Earth (VR)

I had a magical experience the first (and so far only) time I tried a VR headset. I didn't know what to expect. The headset itself was rather uncomfortable since it covered my eyes and ears
, but the video started out with just the Earth in front of me and empty space all around. As I looked down and only saw distant stars as tiny white dots it felt like I was falling. I got that feeling in the stomach of falling, like when you're on a roller coaster and it drops. I experienced that despite being seated in a chair! It wasn't as extreme as when on a roller coaster, but I still felt it quite clearly.
I expected to get a little motion sick, but not feeling like I was falling. After looking down and feeling that, I kept my eyes on the Earth until the video moved on to talked about a big forest, which was a bit easier to handle.

- Age: 25

8
Design fiction

7 narratives
by
Carmen L Clark
Vlad Fratila
Asia
Henrik Korsgaard
Stan
Ona Orlovaite
Ingo van Duijn

Dream recorder

The doorbell went quite early this morning while I was still in bed. I should have been more excited and ready as I knew this package was on the way, but I guess my sleepiness and laziness overcame my sense of urgency. The courier knocked on the door as I frantically jumped around trying to pull my clothes on and look presentable as I ran down the stairs.
I just caught her before she left with the parcel and she turned back and handed me the box and the signing device.
I ran straight upstairs to open the box. It was a small white box. It was a device from a Kickstarter project. I ripped open the box and pulled out the instructions which basically said to download the "DreamZio" app onto my phone for full instructions. I started the app download then opened next layer in the box, inside there was a red felt bag containing two small round devices. I pulled one of them out. It was about the size of a 1 Euro coin, but a half sphere with a small clip on the top. Silver in colour and with some weight probably made of some kind of alloy. Flat side had a black material textured like rubber but shinier. Below the bag in the box there was a smooth elastic ribbon with a clip and size adjuster. The head band I guessed and without looking at the instructions (as I know better obviously) I attached the two round devices to the headband, and tested it for size against my head.
As the pads touched my skin on my temples they vibrated slightly. I pulled off the band slightly surprised and then started to read the instructions on the newly installed app on the phone.

DreamZio set up
1 - ensure sensing device battery is fully charged (using supplied charger)
2 - pair the sensing devices with your phone or tabletvia bluetooth.
2 - fix the sensing devices to the provided headstrap and adjust for tension.
3 - ensure the correct positioning of the sensing devices at the edges of your temples (see diagram 1).
4 - engage DreamZio calibration cycle on your phone or tablet- NB.: This should be activated before you settle for sleep as calibration only occurs during REM sleep and must be completed before your first DreamZio dream-capture can begin.

DreamZio dream capture
1 - ensure sensing devices are fully charged
2- wear sensing device as stated in previous section
2- engage dream-capture mode on DreamZio App.
4 - sleep and dream
5 - when you wake ensure DreamZio app is open on your phone or tablet to allow sync with sensing devices.
6 - once data is fully downloaded to the DreamZio app and the cloud service algorithms have crunched the data, your dream-scape session will appear for you to watch on your phone.

I immediately started charging the devices while I looked excitedly at the stated description:
"DreamZio Captures up to 500 full colour 640-480 resolution still images and up to 500 128kb ~ 5 second sound captures of your dreams. Yes you can record your dreams!! Images and sound clips are interpreted directly from your brainwaves which are recorded while you dream by the DreamZio sensing devices. This data is analysed by DreamZio cloud and formed into a Dreamscape video for you to watch and listen to on your phone or tablet. Recapture lost dreams, remember dreams fully that you partially remember, remember all of your dreams!"
I can't wait to sleep tonight. Many of my dreams that I remember are quite funny, I hope tonights re funny, not nightmares!

By Carmen L Clark
https://writetogether.space/posts/cclark/dream-recorder

iBird

New toy!
Today I've gotten my best birthday present yet! My uncle bought me the new iBird! I'm not much of a tech guy - theatre major here, in case you're a first time reader - but honestly, I can't believe how cool it is.
If you've been living under a rock, let me enlighten you. The iBird is the hip new gadget for the Smart Home. It's a floating device, it looks like a little iris flower and it can interact with every electronic device you own. As you can imagine, it's super-expensive! - I was shocked when I googled it - but let me tell you, it's completely magical.
My uncle helped set it up. It comes in a bright orange box with no markings on it whatsoever - I didn't even know what it was! First thing when you open it is you have to setup its' base station. Apparently, even though it can use the mag chargers, the base station charges it faster, and it also helps to scan the room and whatnot. I don't really get all the details, but the cool thing is you don't need to. You just plug it into a wall-socket and it just works!
When it's turned off, it really doesn't look like much. It's like a large white rose sprout, there are no buttons and no way to actually interact with it. My uncle said to wait 5 minutes, and it will start on its own.
And it did! We were all clanking champagne glasses when my girlfriend suddenly gasped! The iBird appeared out of nowhere, floating in mid-air, and startled her! My uncle told us that it has tiny propellers everywhere. They are incredibly quiet - even if everyone kept completely still and silent, we couldn't hear anything but a very weak buzzing coming out of it. Eerie!
The setup was actually very simple. When it flies, it opens up like a rose in full bloom, and it has a tiny camera right in the middle. My uncle had me look straight at it, say my name and say "Begin setup". It speaks in a female voice, very warm, and slightly metallic. It said to bring up my phone, which I did; it reached out and almost touched it. Everybody was just in awe! In a second, it confirmed that it had connected to the Wi-Fi.
It's first trick was a really neat one, My uncle told me to make it take a picture of everyone. So I was like, how do I do that? Apparently, all it takes is you ask it. "iBird take a picture of everyone!" And it spins a little, as if it wants to see everyone, then moves into a corner and starts counting down: 3, 2, 1, say cheese! and click! the picture is ready. Can you guess where you can see it? Well, lo and behold, the TV turns on and there it is, for everyone to see. Everyone was thoroughly impressed!

Here's my new iBird! [https://d1fs8ljxwyzba6.cloudfront.net/assets/editorial/2018/09/all-dead-ghosts-destiny-2-forsaken.jpg]

More impressions of the iBird
Today I had more time to play with my new iBird, and I thought I'd share some more impressions with you fine people.
So, the cool thing about it is that it already knows about everything I own. It can

lock the door (I just want to say, for the record, that I love my electro-lock now!), it can play music everywhere, control the lights, thermostat, kettle, alarm system... You name it, the iBird already knows about it.
She even gets along with my old TV. I don't even know how! I had her call Mom this morning, and it just followed me around in the kitchen. I was on the phone, but my mom told me that my hair is super-messy. I didn't realise it, but the little iBird was filming me! Even better, I went back to the living room and there was Mom on the TV! I was completely taken aback by this - I didn't setup anything, but somehow everything just seems to work around what I do.
Really looking forward to discover what more can this baby do!

Out late last night
W e were out drinking last night at this little Jazz cafe that Mary knows down-town. Apparently it's a popular watering hole for her musically-inclined buddies. We had a really nice time! They had this fusion mix of beer, cider and something strong, I can't remember what it was, they called it the Lola Bling, and everyone got hammered on it.
Mary's best friend Carla brought her boyfriend, and so we got to meet him for the first time. He works in tech, he tried to explain his job but no one really got it. Sorry dude! Anyway, he also has an iBird, and he has it wake him up if there's an emergency at work. In fact, his company is using iBirds to do all sorts of things like this. He told me he's working on a pet project at his work. They take on-call shifts 2 by 2, and when there's an issue, the iBird knows which one of them is awake, and calls him, instead of the person that's sleeping.
I didn't realise I could use her for an alarm clock. Last night I was too tired, but I'll give it a go tonight and let you know how it went!

New plant
Today I decided I'll try to keep a plant again. It's a small Bonsai tree, Mary chose it. We're bringing it home now. I know I've killed many in the past, but I'll try to be more responsible this time.
edit: iBird to the rescue! You're not going to believe it! I set the Bonsai down on the kitchen table, and the iBird recognised it in a flash! It even sent the watering schedule to my phone.
edit 2: The more I spend with iBird, the more amazed I am. So I did a little browsing on the Bonsai, and it turns out that iBird has a little add-on that enables it to water plants! I ordered it, it arrives tomorrow. I'm finally going to be able to keep a plant!

Back from Bali
I'm back from Bali! It was an amazing week, I'll post pictures later! Funny thing, you know when I leave home for longer than a weekend, I turn off the gas and unplug everything? Well, I unplugged the iBird's base station without realising that it was supposed to water the plants and lock the door. Well, to my surprise, the door unlocked itself and iBird greeted me at the door! And what's more, the Bonsai is in perfect condition! How much battery does this little thing have?

[Comment by Vlad Fratila]
The iBird is me thinking: what if the Ghosts from Destiny were real? I took the image from the game. In Destiny, the Ghost is your companion, responsible for communications, ship navigation, hacking doors and stuff, and reviving you. In real life, I assumed it would be more of a home assistant, but with control to everything you have.

By Vlad Fratila
https://writetogether.space/posts/vladfr/ibird

For the ‘Gram

It is the year 2049, and the 40th year anniversary of my graduation from my alma mater. It is a beautiful, breezy and sunshiny day in May, and I am walking the campus, reliving memories of my undergrad experience, and the friends I made there. We used to walk beneath these cherry blossoms, together on the way to the dining hall. Everything is so different now, though, that I can barely recognize my surroundings. Only these trees remain untouched, bound as much to the soil as they are to my memories.

Ordinarily my friends and I would all meet here for reunion, but with most of my friends abroad or spending time with family, I was the only one who was able to make it. A funny thing, since my "crime" on campus was that I was always away, going on adventures in the city at the big universities. It cost me some friendships, but I was lucky anyway, and forged friendships that withstood the test of time. It was just as my mentor told me. These were the friendships that would last me the rest of my life. Still, it stings knowing that year after year, they can’t be here with me. After dining with a few alumni, and catching up with old acquaintances, the sun sets on campus, and I think of the long commute I must make back to my metropolis. With a wistful sigh, I return to my vehicle, and begin the long drive home.

A few weeks later, I am at home, working on dinner, when I hear a knock on the door. "Hey, Minerva," I say, calling out to my home’s computer. The computer responds, ready to receive my command. "Show me who’s at the door." With a cheerful chirp, the kitchen wall illuminates to replace my recipe with a live feed of my front door. My guest has turned very briefly from the camera, and then jolts to attention as the front door illuminates. Dropping my spatula, I fled to the front door to greet one of my closest and oldest friends the old fashioned way. "Tiffany! What are you doing here?!" I shout, equal parts elated and confused. We giggle like young girls, swaying each other in pure unadulterated joy. I hadn’t seen her in years, but she as always, it’s like no time has passed at all since we last saw each other.

"I came to see you, before I ship off to Mars!" Typical Tiffany, ever spontaneous and adventurous, and dropping earth shattering news like it’s as common as getting a new job.

"Mars?! What on earth for?" It wasn’t exactly the sort of thing I ever expected to be possible in our lifetimes, but regular launches were made for almost 20 years, with commercial launches made available and affordable in the last 4.

"Well, that’s the thing! Nothing on earth. You know how much I’ve traveled, and at this point I’ve explored every continent on the planet. Billy and I thought it would be a great idea to make the trip before we’re too old to make it in one piece!" Her eyes were sparkling. I knew there was no talking her out of this one, crazy as it sounded. It’s true, at 62, they were already testing their luck, but they were in the best shape of their lives, and I don’t know better candidates for the launch. I could feel the sadness welling up. She said she’d be back, but I knew better. Everything else in her life was a means to the single end to explore and meet as make as many friends as possible.

If ever there were a bigger extrovert, I didn’t know them. I could a feel a deep sadness

swelling inside of me. I was thrilled for her, but I knew I would miss her terribly.
"You're never coming back, are you?"
She said nothing for a time, instead, fishing around in her bag. "I got this for you."
From her bag, she removed a cube shaped object, placing it very carefully on the floor. Kneeling, she pressed down on the top face of the cube with her thumb, before standing and walking a few paces away from it. The object levitated, the faces shifting until the object became more diamond shaped. With a pleasant chirp, it emitted a light at Tiffany, scanning her from head to toe. At last, the object turned towards me, before landing in my hand and collapsing into a square, an assuming white with a shiny black rim.
"What? What is it?" I asked, dumbfounded.
Tiffany laughed. "It's so rare to see you stunned by technology! Hold on a second, I'll be right back!" She left the house, closing the door behind her.
I examined the square. It was hefty, but not at all uncomfortable to be held. It felt about as heavy as a tablet might have in my youth. Suddenly, the object began vibrating, startling me. I seemed to watch it fall to the floor in slow motion. Ever the klutz, she had left me with the object for just a few minutes, and I was already ready to break it. But it didn't break, instead landing with a satisfying clack. Before I could stoop to pick it up, the object lights up, a bright node of light tracing the rim of the square. At once, the entire rim illuminates, the device shooting up a beam of light as it begins to form a 3D polygon of my friend, in mid air, filling it in with incredible fidelity. I feel I can almost touch her, but it her visage passes through my fingers like warm sunlight.
Mouth agape, I stare at this image of my friend, who is doubled over laughing. "You should see your face! Actually, wait, I can do that. "The device chirps, reflecting my stunned face back at me. I laugh so hard my eyes fill with tears. At that moment, I truly feel like a child again, like the first time I rode in a Tesla over 30 years ago. As the laughter subsides, I just stare in awe as the image seamlessly flits back to her likeness.
"Okay, so what the hell is this thing?"
"It's the latest in holographic communication technology! I worked for months to make sure nobody told you about it. It will be on the market with a few months, but you get to be one of our beta testers! It doesn't have a name yet, but they're working on it!"
"Wait, wait, wait. How did you even get a hold of this?"
"Friends in high places I suppose," she said, with a mischievous smile. "Okay, I'm coming back inside." The image animates as she moves toward the house, a live feed of her every movement. I am beside myself with glee.
Reentering the house, she takes my hands, and looks into my eyes. "So, do you like it?"
"You know how I feel technology. This is amazing. But why are you giving this to me?"
She looks down, thinking about how to say it for a moment. "The truth is, I'm not really sure if we will make it back. One way is one thing, but we are getting on in years, and there's no telling how the red planet will affect us physically.
We're two of the oldest candidates to sign up! Imagine, me, admitting I'm old!
Ideally we'd love to come back, but, there's always a chance that things won't go according to plan. I know this doesn't make up for me being gone, but, I just want you

to know, no matter how many light years apart we are, we will always be friends."
Tears blur my vision, but I quickly blink them away. "Okay. We'll always be friends."
She hugs me one last time, before turning to leave.
Six months later, I am in my living room, reading the latest news about the launch en route to Mars. The device rests on my bookcase, discreet in its cube form. Minerva chirps up.
"You have an incoming transmission from Tiffany. Would you like to accept?"
"Yes," I respond, scurrying to the bookcase in excitement. Placing it on the floor, the rim illuminates as before, before stitching Tiffany's likeness up in front of me. She is seated, likely on a couch like mine. As her arms form, I can see that she is holding something. No, someone.
Looking into the device, her eyes sparkling with warmth, she says, "Hello Asia! Say hello to the firstborn of Mars!" The device chirps, modifying the 3D polygon, revealing a beautiful baby boy.
I smile, my eyes filling with tears. "I can't believe it. You did it for the 'gram."

By Asia
https://writetogether.space/posts/asia/for-the-39-gram

The packet

A surprise message from a friend was followed by a package arriving at my doorstep a few days later. He had sent me one of the latest prototypes on the project he had been working on for years. When opening the anonymous packet it contained a bunch of smaller boxes of different sizes and colors. Each box had a number printed on the front with smaller letters on the back describing the contents. In the bottom of the packet was a larger flat box with the large Tesseract logo imprinted and a small welcoming text inviting me to "Open;build;connect".

I organized all the small colorful boxes on the dining room table by number and carefully opened the flat box. Inside were a small booklet with the same logo on the front, a small set of tools in a clear cased box – a few small screwdrivers and a weird looking small plastic wedge. I put the toolbox to my left-hand side and opened the booklet. The first page repeated the invitation on the front with an addition: "An idea that is developed and put into action is more important than an idea that exists only as an idea." The next page just read "open box 1" – so I did. The 8x12x2 centimeter sized yellow box contained two objects: A composite flat plate that looked like a red oxidized aluminum on the front with a polymer-like backside. The polymer side was imprinted with a grid with 1mm high walls and a complex circuit like pattern. The second component in the yellow packet was a small steel frame consisting of four corner parts that could slide back and fort, allowing the frame to expand from 6x10 centimeters to 10x16 centimeters. I turned the page in the booklet and it revealed a phone icon and the message to open box 2. The blue box contained a smaller closed box circa 6 centimeter wide and 3 centimeter tall. Within the box was a small instruction telling me to located the corresponding grid position in the frame from box one and click it in. A small screw needed to be tightened to fixate the component. The green box 3 contained a small GPS module that fitted right next to the phone modules. Several boxes later, I had fitted a small sensor component measuring humidity, air quality and temperature, a NFC component, a WiFi component, a speaker and microphone, a specialized component for audiophiles delivering sound to the a mini-jack input near the frame edge, a micro-SD port fitted with a memory card, and a gyroscope and accelerator module. The second last box contained a battery pack that filled the last slot in the back plate. The full plated looked amazing with all the small components sitting tight and all the small icons indicating the function of each component. The final package had the same footprint as the first one. This one was black and more sturdy than the previous boxes. Inside was a piece of foam placed careful on top of a large glass covered display. The instructions told me to position the display on top of all the components and press carefully, counting the 'clicks' as each component fitted the backside polymer grid of the display. The second last page in the booklet contained instructions on how to tighten the steel frame from the first package. Upon fitting the frame, the few input ports and buttons on the side were still accessible.

In my hands I had a sleek looking 8mm thick device, with a 60mm by 110mm dis-

play. It felt gorgeous and looked, to my surprised, like it had come off an assembly line with a perfect finish. I touched the large button on the right-hand side of the device to turn it on. It booted with the familiar Tesseract logo and "Open;Build;Connect;" After a second, the screen showed an image similar to the frame inside with all the components. For each component, a short initiation check indicated it was working as intended. Shortly after to device booted into a front page with application icons representing each component. I immediately located the phone icon and rang my friend to thank him for the overwhelming gift. We talked at length about the device, the intricate assembly process, the fact that all the components were made from sustainable materials and under fair pay and working conditions. He told me about the struggle to develop each component so that it could be upgraded or replaced by other features, and how this had required an entire new way of developing the open sourced software for the device to ensure that it did what it should and no more or no less. We discussed the decision to ban popular applications that were known for surveilling the user or cause frequent stress and frustrations with endless notifications. After an hour or so I put down the device at my desk next to my mechanical keyboard and admired the aesthetics of my two favorite builds.

Several months later the device still rests on my desk when at home. If not charging it just sits there acting as a smartphone with a few additional features. I have discovered that a small desktop application allow me to use it as a track pad etc. Although some of the initial thrill is gone and the novelty has disappeared, the device still invokes a sense of pride in having a piece of technology built by principles and values resonating with my personal beliefs. I still get remarks when people curiously ask and pleasure in explaining the device, how it works and what represent. A different way of thinking personal computers as something you customize and built yourself; something that is not funded by underpaid workers or unsustainable production methods, or your attention and data; something personal, sustainable and educational. I have already pre-ordered a 5G module and look forward to re-opning the device and replacing the phone component when it arrives.

By Henrik Korsgaard
@heenrik on Twitter.com

[Phone case]

I have a close and personal friend who has known me for 15 years. When we were younger, we used to go on hikes all the time, go out drinking, watch baseball games, go bowling, and so on. About five years ago, I bought an iPhone and found that I was always carrying it in my hand, looking down at it, opening one of several apps to check my mentions. It was aggravating to my old friend, who felt like it was now competing with the time we spent together. He would tell me so, and I would begrudgingly admit that the phone was a bit of a crutch for me, but I really was hopelessly addicted to it. On my 40th birthday, he surprised me with a gift he felt would cure me of my compulsions. It was a phone case that slowly gets hotter the longer you use your phone. Admittedly, it was a heavy case with a large battery that took hours to charge, but it promised not to harm your phone. The purpose was that using the longer you look at your phone, the more uncomfortable the experience would become. Kind of like shock therapy. I laughed as I opened the gift and immediately installed it on my phone.

After my birthday party, I got my first taste of the device. I laid on my couch and watched YouTube videos for about half an hour, forgoing the day's duties for a little while, and suddenly I realized that I couldn't touch my phone anymore. It felt as hot as toast that just came out of the toaster. I put on some mittens and watched 10 more minutes of videos, but the mittens started to become singed. I tried oven mitts and eventually welder's gloves, but the phone would get progressively hotter no matter what I did, even while keeping the phone inside of the case at a cool 72 degrees Fahrenheit.

After 6 months, I continue to use the phone case. It hasn't actually reduced my screen time very much, but I am developing some scar tissue that allows me to use the phone at certain temperatures that most people wouldn't be able to handle. I would remove the case, but I really like the ergonomic design and color, and when it gets so hot that I drop my phone, it does a very good job of protecting it.

By "Stan"
@StanDAlone2016 on Twitter.com

[Notebook]

I am trying to find the edge of the sticky tape covering the box without damaging a dark green gift wrapping paper. It is always a frustrating experience. While I am doing it, my excitement builds up. I finally reach the box—it is not much bigger than a thick book: sharp edges, glossy pearl-like finish. I gasp; it looks really sleek. Nothing more but a single thick wavy line is drawn with a pen on the top of the box.
It must be a logo,- I think to myself. But the looks are not revealing much, so I start looking for a way to open it. As I am running my fingertips along the bottom edge of the package, I activate the opening mechanism – the front wall starts opening softly as if the whole thing was like a perfectly engineered machine. It seems excessive for, what I assume, is just a package. It must be expensive, I think to myself and my curiosity increases even more.
Underneath the lid is a carved hole for the product, which lays flat down. It is a notebook, I think to myself and get both excited and confused. A fancy packaging for a notebook! Or is there something more to it? I reach towards the box and pick up the notebook. Nothing seems special about it—just great quality and a lovely dotted pattern on it. I am glad because there are simply too many notebooks that are ruined due to bad paper.
Underneath the notebook, I find a pen. Another sleek, good quality product, ergonomically and aesthetically pleasing. I instantly press the button, and something happens – after the softened -click- sound, I start seeing the menu projected on the notebook. It looks like one of these picture editing programs, really, just simplified. Well, at least it reminds me of them.
My eyes dash through features: colour, line thickness... It seems, however, that I can not only pick 'the usual features' but also types of pens, like fountain pens, markers, watercolour and types of paper, paper patterns, thickness or even canvas. There is no manual in sight, but I want to know what I can do with it.
I am surprised by how realistic both the pen and the notebook look like; however, the digital menu indicates that there is something groundbreaking about this. I decide to choose another type of paper, and the whole notebook turns into sheets of rice paper. This doesn't make sense to me, I am baffled. Instinctively, I rip off a sheet, and I am now in shock – I have an empty sheet of rice paper in my hand. How the heck? Now, I regret doing that; what if I have only a handful of them? I try adding it back to the notebook, and it instantly seals back to it, like being suck into a field of gravity.
I start scribbling. The resistance, the feel of real paper, the quirks and qualities of each element are there... Not only that, the digital augmentation allows me to mark and drag my scribbles around, resize them and manipulate them in ways I haven't seen before. And you know the pipette function? Guess what, that works too! On any digital or analogue surface.
I have always been fascinated by notebooks but this gift, I don't even know whether I deserve it. This product must be way too expensive in regards to what I am capable of doing with it. As much as I am fascinated by it, I am also intimidated.

Rating: 5 stars
During the first week, I was constantly playing around with the notebook and trying to learn new features. However, I must admit that I have been using it mostly for writing notes. It is just a ridiculously good quality pen and paper, I don't leave my house without it. Especially, after I found the feature of turning my hand-written notes into typed letters and vice versa! I have never been an artist, but it has improved my work tremendously in a way I could not have expected. Now, I usually sit on my porch and work on my notebook. I simply enjoy the e-ink technology which doesn't tire my eyes or affect my melatonin level as a standard tablet does. The simplicity of it and minimalist design add a great deal to the whole experience.

By Ona Orlovaite

[Rat translator]

The box is small and contains two devices, the charging dock, and the manual.
I quickly peruse the latter to see if there's anything important I need to know.
Apparently there is some app I can use with the product, but it does not seem necessary, so I decide to just give it a try.
I put the small earplugs in my ear, and press the big button on the larger device to turn it on.
Luckily it came precharged, because a blue light immediately fades in, and -- oh my god -- can I actually hear them?

I turn to my rat cage to see both Lana and Hiro curiously sticking their heads out to me as they always do.
This time however is different, I hear two muffled voices muttering something excitedly.
I open the glass cage and the voices become clearer.
It's not clear speach however, but more of an echoey dreamy voice like Navi from Zelda's Ocerina of Time,
saying things like "Oooooh", "Look!", and "Food".
I reach out to pet one of them, and one of the voices changes to a lower pitched "Oh, hi" and something sounding like a comfortable moan (everything is still quite high pitched though).

I think I spent nearly two hours just playing with my rats before I started to get curious what else was possible with this magical device.
Apparently the app allows you to input some basic information about the animals, so that it can more efficiently learn what they are saying.
This indeed made their voices slightly more distinct, and it picked up some new stuff after I told the app it is listening to two adult rats.
Over time however, the real magic happened. The device seems to recognize the physical squeeks of my rats and has learned how to flawlessly turn it into something understandable for me.
I'm so used to it now, that when I take out the earplugs, it's almost like turning off my rats...
However, given the choice to have pets with or without this device, I would devinitely choose with (these earplugs are actually quite comfortable anyway, and connect to other stuff as well :)

By Ingo van Duijn

9

Data Analysis and Findings

9.1 Narrative overview, sorted by type

As part of my analysis and to create an overview of the narratives and the types of interactions in them, I placed them into the types from section 6.3 Science fiction and magical technology. A handful did not fit into the existing categories, which were based on technology found in science fiction.

Instead, these narratives centers around the materiality of the object, which becomes the quality in focus. The magic here happens in the interaction *with* the device. An updated table of ways to look at magical interactions can be seen in Figure 9.1

The narratives and their technology focus can be seen in Figure 9.2.

The device and interaction is...	The focus	Keyword	Examples can be found in:
Boring in itself	The effect	By	The Euphio Question (Vonnegut, 1951)
New and interesting	The interactions and actions around the device	Around	Record of a Spaceborn Few (Chambers, 2018)
Made of known technology, but is more advanced	The device becomes a vehicle, a portal	Through	Neuromancer (Gibson, 1984) & Ready Player One (Cline, 2011)
An object	The materiality	With	Kindle narrative

Figure 9.1: Overview of the ways to look at technology now including (*with*).

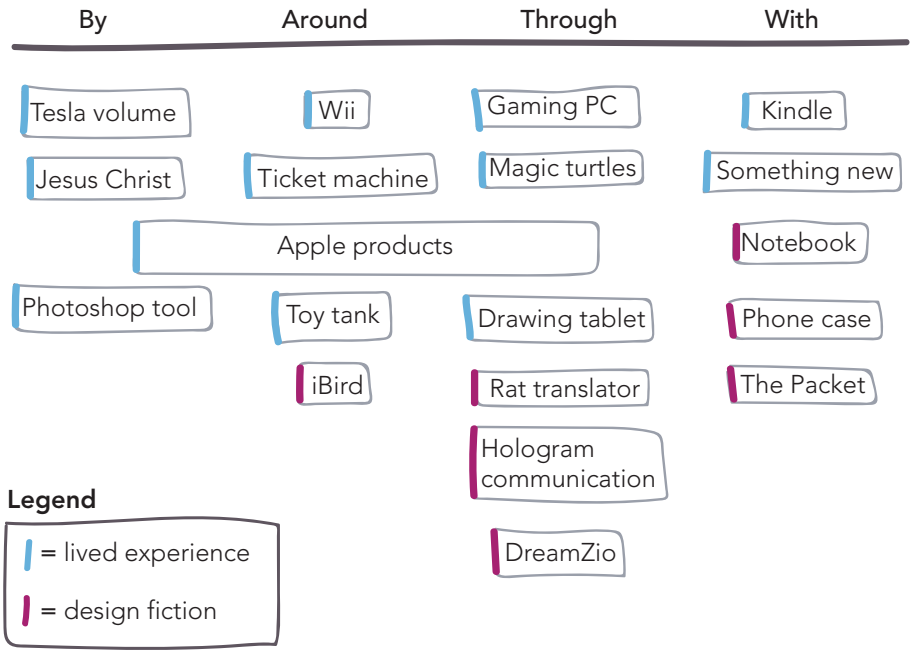
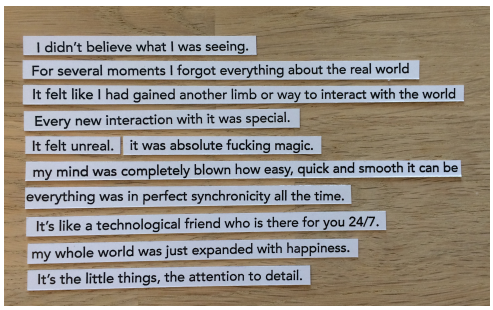


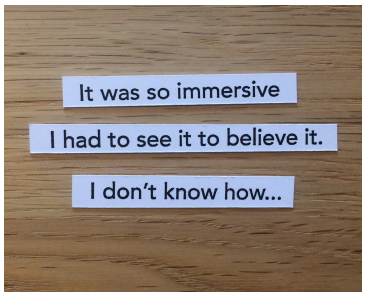
Figure 9.2: All the narratives sorted by the keywords from Figure 9.1.

9.2 Synthesis of lived experiences

As a way to get deeper into the narratives of lived experiences, I cut them up and picked the parts I found most interesting. From this, I tinkered a synthesis story. This story does not make a whole lot of sense, but it captures some specific elements from these stories and displays them in a new way. Interestingly enough, the three snippets I had leftover after creating the story also seemed to be the essence. The synthesis story can be seen in Figure 9.3(a) and Figure 9.3(b).



(a) A narrative synthesis from the lives experiences



(b) The "leftovers" from selected snippets

Figure 9.3: Tinkering with snippets from the narratives of lived experiences.

The synthesis story reads:

I didn't believe what I was seeing.
For several moments I forgot everything about the real world
It felt like I had gained another limb or way to interact with the world.
Every new interaction with it was special.
It felt unreal. it was absolute fucking magic.
my mind was completely blown how easy, quick and smooth it can be
everything was in perfect synchronicity all the time.
It's like a technological friend who is there for you 24/7.
my whole world was just expanded with happiness.
It's a little things, the attention to detail.

From this synthesis, themes begin to emerge. These will be unfolded in the following sections as well as those that came from coding and organizing all the narratives.

9.3 Results

In the following sections I will present what I have learned from my analysis of the lived experiences and the design fiction.

9.3.1 Magical experiences exist on a scale

From the narratives of lived experiences I have found that the magical moments come on a scale of magical impact. They do not all have the same size. Some are everyday magic (like the volume control in a Tesla), some are everyday occasional magic (like the random song that fits the situation so perfectly it *might* be something other than pure coincidence) while others are rare mind boggling experiences (like the experience in Disney World with a talking turtle that seems to be more than just preanimated and yet so effortless that it seems impossible it is controlled live by a person). Though I will claim they exist on a scale, this scale is not universal. I do not find it helpful to rank all the narratives, as it is very individual and what might be a big moment to one person might not be it to another.

9.3.2 Time

Time is a big theme through a lot of the narratives. There is the tendency that the *first* time holds a special kind of magic. In the narratives of lived experiences, the first time is mentioned a lot. These are:

> The first time in general with a new product in 'Something new',
> The first time with a Wii console,
> The first time with a ticket machine that just prints the ticket without any trouble,
> The first time with a new tool like a drawing tablet,
> The first time a new universe is discovered through a gaming PC,
> The first time the content-aware fill feature in Photoshop is demonstrated,
> The first time with a Kindle that turns out it actually *does* look like paper,
> And the first time with an Apple TV.

Based on the tendency from the lived experiences new things was a focus point in the design fictions — it seemed like it was something that could be explored more. Especially the lived experience 'Something new' focused on the unboxing, which I felt would be a good lead into the explanation of how it worked in the design fictions.

This feeling of new and exciting might fade over time, but it was not described in the lived experiences. Therefor I thought it would be interesting to see if this feeling of magic is still there after the second, third or 50th time it is used. The participants for the design fiction was asked to describe the experience of using their imagined digital technology after half a year. In 'The packet' is gets described like this:

> Several months later the device still rests on my desk when at home. If not charging it just sits there acting as a smartphone with a few additional features. I have discovered that a small desktop application allow me to use it as a track pad etc. Although some of the initial thrill is gone and the novelty has disappeared, the device still invokes a sense of pride in having a piece of technology built by principles and values resonating with my personal beliefs. I still get remarks when people curiously ask and pleasure in explaining the device, how it works and what represent.

So the initial magic has turned into a longer lasting feeling of pride because the product is a reflection of values that are important to this author. Like when the feeling of being in love with someone you are in a relationship with turns to a deeper love.

In 'Notebook' the magic is gone, but the author is left with a product they still enjoy and the notebook reaches a place of use rather than exploration:

> Now [as opposed to the first week], I usually sit on my porch and work on my notebook. I simply enjoy the e-ink technology which doesn't tire my eyes or affect my melatonin level as a standard tablet does. The simplicity of it and minimalist design add a great deal to the whole experience.

While in the two above mentioned narratives the magic had faded, real magic in 'For the 'Gram' only happens after six months as the character gets to connect with her friend in a very emotional and personal moment:

> Six months later, I am in my living room, reading the latest news about the launch en route to Mars. The device rests on my bookcase, discreet in its cube form. Minerva chirps up."You have an incoming transmission from Tiffany. Would you like to accept?""Yes," I respond, scurrying to the bookcase in excitement. Placing it on the floor, the rim illuminates as before, before stitching Tiffany's likeness up in front of me. She is seated, likely on a couch like mine. As her arms form, I can see that she is holding something. No, someone.Looking into the device, her eyes sparkling with warmth, she says, "Hello Asia! Say hello to the firstborn of Mars!" The device chirps, modifying the 3D polygon, revealing a beautiful baby boy.I smile, my eyes filling with tears. "I can't believe it. You did it for the 'gram."

The new technology in 'Rat translator' is interesting at first, but the magic gets stronger with time: "Over time however, the real magic happened. The device seems to recognize the physical squeeks of my rats and has learned how to flawlessly turn it into something understandable for me."

A solid magical technology would be something that is intriguing during the first interactions and is open for exploration. Over time it should evolve with the use and make the user more powerful.

9.3.3 Exploration and surprise

In both the lived experiences and the design fictions, exploration and discovery of features are present. It becomes magical when this exploration uncovers a positive surprise.

Two of the design fiction narratives contained the word startled. In 'iBird' it plays out like this: "We were all clanking champagne glasses when my girlfriend suddenly gasped! The iBird appeared out of nowhere, floating in mid-air, and startled her! My uncle told us that it has tiny propellers everywhere." and in 'For the 'Gram' it is described as follows: "I examined the square. It was hefty, but not at all uncomfortable to be held. It felt about as heavy as a tablet might have in my youth. Suddenly, the object began vibrating, startling me. I seemed to watch it fall to the floor in slow motion."

This indicates there is something intriguing about unpredictability, which falls in line with the element of discovery.

In 'Something new' the author describes the act of exploration as follows: "I think the magical or whimsical experience comes from having something new arrive to interact and influence me. An object or technology I am not used to and is free to explore the new impressions I am receiving from it."

In 'Jesus Christ' an MP3 player is able to turn a stressed situation into a magical experience when the song played seems a little too perfect to be coincidental[1]:

> One time my cousin and I were driving in Brooklyn (back in 2004 or 2005) and we started to pray to Jesus that we would make it to our destination (jokingly, because we are both atheists, but her car was very unreliable) and the MP3 player on shuffle randomly started playing "The King of carrot Flowets, Pts. 2-3" by Neutral Milk Hotel. Opening lyrics blasting through the speakers: "I love you Jesus Christ, Jesus Christ I love you, yes I do". We made it to our destination.

My own experience with Siri is also very much about a positive surprise that occurred because of exploration.

A truly magical device can surprise even after the initial interaction. It should be able to deliver continued surprises of features and details, which gives the user a desire to test and explore.

[1] I believe this scenario would have a different feeling to it today, since some people are convinced their smartphones listen to them and serve them ad content which match these private conversation.

9.3.4 Flow and immersion

Flow and immersion are also themes found in both the lived experiences and design fiction narratives. Especially the importance of flow in an interaction becomes visible in the lived experience about a ticket machine:

> After not being in my home country for a while, the first time when I got to try out the newly released ticket-vending machine(for public transportation) using touch-screen entirely changed my perception of using the whole public transportation system! I just got to the machine, tapped the screen a couple of times and in no time I found myself holding the right ticket, exactly what I wanted without any hassle, unnecessary confirmation questions, overwhelmingly many options etcetc.... and my mind was completely blown how easy, quick and smooth it can be to buy a ticket.

This experience was so great it changes this person's view of the system that surrounds the ticket machine itself.

In 'iBird' the connection with other devices is so fluid and seamless it sets focus on the things the author does. The flow and ease in the use, like with the ticket machine, becomes a part of the magic in the device:

> So, the cool thing about it is that it already knows about everything I own. It can lock the door (I just want to say, for the record, that I love my electro-lock now!), it can play music everywhere, control the lights, thermostat, kettle, alarm system... You name it, the iBird already knows about it.She even gets along with my old TV. I don't even know how! I had her call Mom this morning, and it just followed me around in the kitchen. I was on the phone, but my mom told me that my hair is super-messy. I didn't realise it, but the little iBird was filming me! Even better, I went back to the living room and there was Mom on the TV! I was completely taken aback by this - I didn't setup anything, but somehow everything just seems to work around what I do.

Staying in the flow is important and with the small detail of volume control in a Tesla car, the user can leave the bubble of your car space and come back without abrupt starts and stops in the music. It is aware of the context and acts accordingly:

> If you are listening to something in a Tesla and you open the door. The music doesn't stop playing but it does drop the volume automatically so as to not blare out around the vicinity of where you are parked. Close the door the volume resumes.

The next level after flow is immersion; when the device becomes a portal. This is the case with the narrative 'Gaming PC':

> The first time I got a gaming PC and could play PC-games was a magical experience for me. It was so immersive, I felt like an entire new universe with hundreds of different stories, worlds and friends were hidden right behind the screen, waiting for me to throw myself into the experience.

This immersion might even give the user the feeling of having gained the power of a new (type of) limb, as is the case with the 'Drawing Tablet':

> I was giddy with how cool it was that I could now draw digitally and use digital art tools. [...] It felt like I had gained another limb or way to interact with the world

New tools, like a drawing tablet, does not necessarily lead to a magical experience. I have a Wacom tablet myself and it feels like a struggle whenever I use it. The person from the lived experience above was an artist and had the skills to absorb this new tool and use it to its full potential.

A good magical experience is one that allows the user to be immersed or as a minimum kept in a flow.

9.3.5 Connecting

Another theme in the narratives is that of connection and sharing; connection to other people, between products and to other beings. This was first expressed in the narrative about Apple products:

> The first Apple product where I experienced a slight magical feeling, must be my Apple TV. Beatiful design both software and hardware, fast, user friendly and was capable of screen-sharing my iPhone - so I could show my pictures on a 50 inch Ultra HD TV.

And later in three of the design fiction narratives.

In 'For The 'Gram' Tiffany and Asia's connects across different planets. Ingo connects to the pet rats, that could be understood with the rat translator and iBird that connects to products in the home and enabled a conversation to the author's mother to become richer.

Technological devices do not exist in a vacuum. They become a part of a social context or a system of other products. This is important to account for when they are designed.

9.3.6 Understanding

In 'iBird' the author writes they are not a "tech guy" which indicated this person does not have an understanding of how the iBird device works exactly, but that is not necessary either. It just works and like with the quote by Binsted "There is more to magic than incomprehensibility. Magic is about having power over the world around us" (Binsted, 2000, Introduction), this person can achieve the things they want without any trouble.

In the lived experience about a talking turtle in Walt Disney World, the lack in understanding is part of the magic. The experience has stuck with this person, like a puzzle that is still not solved. It is clearly controlled by technology and not actual magic, but that seems to be a part of the magical experience for this person:

> To this day, I have no idea how 1 man could control so many things at the same time. The guy was extremely funny too, so he might not even have been tech-savvy. But everything was in perfect synchronicity all the time. The kids in the room and my nephews thought nothing of it, but I was completely dumbfounded.

In both cases, the understanding the person has about the world overlaps with the magical experience, but this overlap is not 100%, which means these magical experiences often lies on the boarder of our understanding (see Figure 9.4.

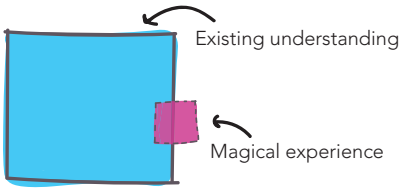


Figure 9.4: The overlap between our understanding and magical experiences.

In the case of my experience with Siri, I had an idea of how to formulate the question so I would get the answer I was looking for. The experience was almost within my area of understanding, but the magic happened because it actually worked, which I did not expect.

This means that magical experiences occur on the boarder of or outside out current understanding of the world. Like with the four magical realities (Rasmussen, 2013), the breach in our understanding can lead to magical experiences. This is not to say that incomprehensibility is a sure way to create magical experiences. We need the unexpected discoveries or a power over the world around us as well.

9.4 Summary

I have found that magical moments happen on a scale of magical impact, that they are not all of equal size, but that these moments are highly individual and putting them into a universal scale would not mean much.

Time is an important aspect in the magical moments. First of all, they are often temporary. Secondly, the first time a product in encountered/used holds a special magic to many. Thirdly, that does not necessarily mean the magic is gone after the first time. In some cases the magic builds over time during use or the magic happens after a while when something new is discovered. This leads to the fact that exploration and surprise are key elements in magical experiences. The sense that the there is something to explore and discover, often through unexpected surprises, can give a sense of magic.

Magical experiences often happen when the user is in a state of flow or feels immersed. Sometimes they also involve a sense of connection to other people or an invisible network between devices.

Most importantly these experiences seem to happen at the edge of your understanding. The way we see and experience the world gets widened a tiny bit in these moments. Not by much, but enough to engender a feeling of wonder.

10

Discussion

10.1 Discussion of findings

It could be argued that some of the findings of this thesis are obvious and trivial. I would argue that the overall research done in during project is far from it! The question of magical moments is a valid one, one that other researchers have suggested as a possible topic to be looked into as well. It is complex and the line between magical and non-magical can be paper thin.

This thesis is not exhaustive, but it does provide a foundation of knowledge into this topic with opportunities to build upon it.

10.2 Reflection on methods

The main methods used in this project have been threefold:
Tinkering, narratives of lived experiences and design fiction.

In the following sections I will discuss the way they were used and my reflections on this.

10.2.1 Tinkering

Tinkering was used as a method in the beginning as a way to attack a rather abstract topic. It was also used in the analysis to create a familiarity with the material. It worked well in that it forced me to do something and it resulted in something rather concrete.

The act of material tinkering seems like a good exercise in all design projects. It forces the designer to deconstruct the topic and put it together in a new and different way and by that generate a new sense of it. It can make you aware of which qualities fit and which do not. The abstract is forced into a physical form.

Were I to start over again, I would have invited others to join me in the first tinkering session. At the time I was unsure of exact was I was doing and what it would end up with. Looking back, having someone else to go through the same process and come up with tinkered objects that were either similar or different to mine, could have added more depth and nuance.

10.2.2 Lived experiences

The way I examined my second research question "What do people experience as magical interactions with technology? When do these magical experiences with technologies occur?" was through a collection of narratives of lived experiences. This was combined with the design fictions as well, which will be discussed in the next section.

I find that collecting the lived experiences the way I did, gave me an opportunity to have look at them in a way I would not otherwise have. Getting so many different small stories afforded a width in different experiences that would not have been possible, had I only done e.g. a handful of interviews. BUT that said, I do wish I had had the opportunity to do some follow-up interviews with the authors of some if the narratives (ideally it would have been all of them). This could have clarified some things and possibly expanded upon the experiences, resulting in even more nuances. I will take this with me to future projects.

10.2.3 Design fiction

Design fiction is a method within design that currently gets explored and through different projects it becomes more and more clear what it can be used for and what it might not be so suitable for. Within my project I found that people are definitely capable of using their imagination to dream up new technology. All of the stories included lovely design ideas. My issue with most of them are that the authors seem to get swept away in the process of coming up with new cool technologies that the inquiry into the magical moments get overlooked. In most cases it is still there, but it did not become as crystallized as I had hoped for.

I have included all stories, but especially as I read the one by Stan (one of the last ones I got), I realized that Stan had come up with a very nice critical design idea, but it did not leap off the page as very magical. What I was trying to examine did not seem to be there. Stan's story poses a problem (a phone addiction) and a solution (a phone case that gets hotter the longer the phone is being used). The story, 'Phone case', ends with an update after six months:

> After 6 months, I continue to use the phone case. It hasn't actually reduced my screen time very much, but I am developing some scar tissue that allows me to use the phone at certain temperatures that most people wouldn't be able to handle.

This phone case has not solved the problem. Nor does the interaction with it or the effect from it seem very intriguing or magical.

With the knowledge from this project, I do not believe design fiction is the optimal way to look at these magical moments or something similar to that. The project about participatory design fiction in a group of vulnerable people (Naegele et al., 2018) where design fiction is used as a way to come up with new ideas for future prototypes seems to be a better direction in the use of the method. In my experience, people are brilliantly creative when it comes to imagining new technology. It is important that this quality is leveraged correctly, because when it is, it can be a powerful method.

I would not say my experiment with design fiction as a way of inquiry was a failure. I did get some good insights from it, but it works because I have other

materials to hold it up against and supplement with.

The utopia of fictional technology

With the exception of Stan's story about the phone case, all of the design fiction narratives took place in an almost utopian world. The technology just *worked*. There were no breakdowns or difficulties. It worked and it worked really well. This is not necessarily a bad thing as they were asked to write about technology that was as magical as possible. But from my own experience there is something in the fact that sometimes it does not work, that makes the feeling of success even greater. The contrast plays a role that was not explored in the design fictions.

Another thing worth pointing out, when commenting on the theme of utopian technology, is that in 'iBird' there were no reflections on the issues of privacy and security. This might be because the author is not a "tech guy" and like with people in general, privacy and security is not something that is spent much thought on. To me it would be highly disturbing if a product instantly gained access to all electronic devices in my home and even had a unannounced built-in camera that would film me during phone calls without my consent. Privacy and security should not be traded in for the feeling of magic. What the author of 'iBird' found magical was deeply disturbing to me, because I consider the underlying mechanisms and consequences of this.

Current or near future technology

During a discussion with Ingo, the participant who wrote about the rat translator, the possible problem of 'current or near future technology' in the writing prompt was brought up. What does this mean exactly and do people know the difference between near and far future technology? The participants' knowledge on what is possible today versus in 2, 5 or 10 years might pull in different directions. Combine this with the task of imagining something magical and the result might be very far from what is possible even within the next 20 years. I did not find this to be a particular problem in this project, but it is worth noting in future uses of design fiction.

10.3 Overall project reflections

Looking back on the past four months project, there was room for more experimentation that what was done. It is always easy to stand at the end of a project and list all the things that could have been done differently, but in most cases, this knowledge is gained from the process of doing the whole project.

I am a very cautious person; I like to stand on land and test the ice with one foot only. Other people jump right onto the ice without even thinking it would not be able to carry their weight. I will probably never become like those people, but I believe there is room for a little more faith and courage in my research.

11

Conclusion

The experiences of magical interactions turned out to be a hard but meaningful and inspiring journey. I went from thinking I could find the ultimate truth about these experiences, that there was a mathematical formula to be derived to realizing that is definitely not the case.

During this project I have found that:

1. The magical moments with digital technology are temporary, but they still leave a lasting impression. Based on my own experience they come from a place where a brief second of anticipation turns to a feeling of success. There is a curiosity to them and there is a sense of reward when this curiosity yields a discovery.

2. People in general experience magical moments with digital technology. They vary is size and they are often on the boarder of our existing understanding of the world and the things around us. They can happen within "magical realities", when the laws of physics are broken and the rules of our reality seem to be bent. In my study this did not seem to be the main cause though. Instead the magic was caused:
   − *By* the effect of a device.
   − The interactions and actions *around* a device
   − *Through* it when the device or setup act like a portal that gives the person new abilities or creates new rules for what technology should be able to do.
   − *With* the materiality of the device as the dominating quality.

   Many magical moments happen during the first interactions with something new, but that is not the case for all of them. Sometimes the magic builds over time as the device is used or happen unexpectedly after years of use.

   The element of exploration and the ability to surprise can be a catalyst as well as putting the person in a flow or experience of immersion. The ability to create a connection and being able to share with other (human) beings also seem to be a cause of magic.

   The magic happens between design and technology. It is when it is shaped, designed and put into a context the magic can happen.

3. Though using design fiction as a way of inquiry into magical moments with digital technology seemed theoretically coherent with the process and like a logical next step, it turned out not to be ideal. Trying to crystallize imagined experiences along the lines of that in science fiction ended in several lovely stories about imagined technology, but the essence of magic was lacking. Design fiction in this project was not completely useless, but the method seems to be suited better as a way to explore new technologies and the interactions with them. Thus this project presents a methodological contribution to design fiction.

I hope my research will inspire for even more magical interactions with digital technology in the future.

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Appendix A

Design Fiction Prompt

This Design Fiction writing prompt can also be found at: writetogether.space/posts/kirstine-granzow-larsen/writing-prompt-design-fiction

Short introduction to the project:
As you may know, I'm currently writing my Master's thesis. The project is about those magical, whimsical and delightful moments that sometimes occur between people and digital technologies. I'm looking at them from different angles and with different methods and that is where you can help me.

Whether you have experienced one of these moments or not doesn't really matter. I need you to write a small text — it doesn't have to be long, anything from a few sentences to a page is perfect. Below you'll find a small writing prompt and some questions. You can use the questions as inspiration, but you don't have to answer them.
If you've previously had a magical experience, you're welcome to use that as inspiration as well.

Prompt:
The task for you is to write a personal narrative set today or the very near future. You can write it however you want e.g. as a blog post, a series of tweets or a first-person experience. Imagine you are this person and describe what happens. It might involve technology you are not sure exists yet or it can be something that's already a product today.

You have been given a present by a friend. This friend knows you well and is convinced this is a perfect present for you. When you open the present, you find a new product/device. You've heard rumors that this product/device should be the most magical thing to interact with.

Please describe this product/device and what you experience when:
- You unbox it
- You use it for the first time
- You use it after 6 months (is it still magical or has it become everyday "magic")

Include as many thoughts and feelings as possible.

This method is called Design Fiction and is inspired by science fiction so please feel free to use creative words and ways to express yourself.
You're also very welcome to include drawings or sketches if you'd like.

Questions for inspiration:

- What do you use the product for?

- How do you turn it on?
- How do you interact with it?
  - Do you touch it? If yes, how so?
  - Does it have any buttons?
  - Is it voice controlled or can you gesture at it?
- What does it look like when it's turned off?
- What do you think while you interact with it?
- What feelings come up when you use the product?
- How often do you use it?
- Does the product react when other people are near it?
- Is the product similar to other products you know?