bots

HOME ROBOT ASSISTANTS

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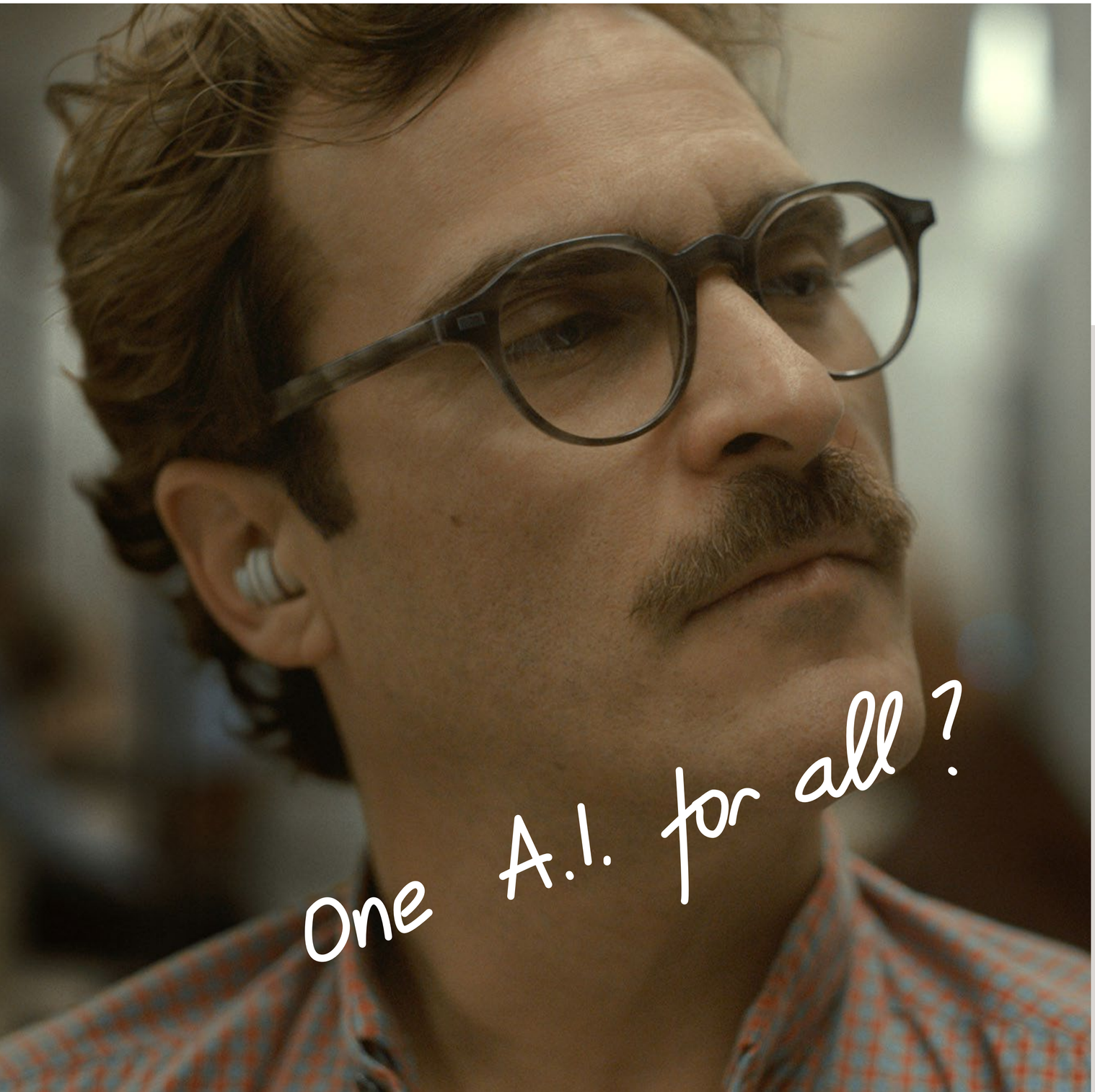
SUMMARY

Companies put a lot of work into making sure that our virtual assistants (Siri, Cortana…) reflect the voice of their brand. What if we could decide what our virtual assistants did and how they behaved? This project proposes a modular system of bots – artificial intelligences with their own narrow personality and functionality – that collaborate with each other to make life alone a little more interesting in a near future smart-home. Three video scenarios explore how an 86 year old senior citizen might design her robot helpers beyond merely functional ways. The final design consists of a catalogue of bots, their packing, a central unit to place the bots, a speaker component and a way of interacting with them.



OPPORTUNITY

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We take the design of virtual assistants for granted. A great deal of work goes into making sure Siri reflects Apple's brand voice. In close collaboratoration with writers and marketers, designers deliberately craft a personality that effectively serves as an artificial spokesperson in what it does and how it expresses itself. There are of course great reasons for this: personal assistants interface with all the company's existing services and act as a de facto gatekeeper to keep customers inside its own ecosystem.

One challenge the designers of virtual assistants face - especially when designing conversational interfaces - is that users don't know what the assistant is capable of: users literally don't know what to ask. And since the assistant uses human language and mannerisms, users end often end up in frustrating situations where the assistant cannot understand their request. At that point there is nothing that one can do. The assistants capabilities are ultimately determined by its creator.

With this project I'd like to look into what happens if virtual assistants didn't come fully formed. What if we could design an AI to meet more than just merely 'functional' needs?

Still photo from the film Her (2013) written, directed and produced by Spike Jonze

AUDIENCE

–

The 2015 Ageing Report issued by the European Commission states that by 2060 the EU may face having half the working age people for every person aged over 65. Most likely people will look to technology as cost effective way to deal with the increased demand for in-place ageing. Designs that specifically target seniors by focussing on functionality may result in design-for-relatives: the family relatives buy the products for their elderly family members, who actually find them embarrassing to use. I chose a 86 year old senior citizen as my main character but decided not to focus on issues we associated with old age (fall detection, tasks of daily living, etc.) to highlight that technology might have a bigger role to play than just ‘the basics’. I hoped this approach would result in a less stigmatising product. Upon reflection it also means that we can easily imagine how an young architect or a college freshman might choose the bots for their home.

“It has come very useful when I fell in the shower. But my daughter wants me to wear this all the time. I never do.”

IMPACT

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The project resulted in three short films of how a senior person might personalise their home robot assistants. The films and the props were exhibited at Humlab-X, an interdisciplinary digital lab at Umeå University. At the exhibition, viewers were asked to imagine new bots that they want for themselves.

The following pages describe the resulting system and each component in more detail (the Bots, the Brain and the Senses).

THE BOTS

–

A bot – short for robot – is an artificial intelligence that focusses on doing one simple thing well. It combines both functionality and personality and a simple character. For instance, Shop Bot is always in a hurry to deliver anything to the owner's door in under 10 minutes. Meanwhile, Surprise Bot is delighted to coordinate other Bots to come up with a surprise for its owner. The bots differ in that the latter level of success strongly relies on the quality of other bots being present.

Similarly to todays apps, bots ofen act as interfaces to various services provided by the service economy.

Bots only become active when placed inside the main component of the system: 'the Brain'.

Bots communicate in a language understandable to us humans. But compared with today's virtual assistant they only understand things directly related to their speciality.

Over time, bots learn from their past behaviour if they are praised or critiqued. This can happen through human interaction or through other bots that possess this functionality.

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THE BRAIN

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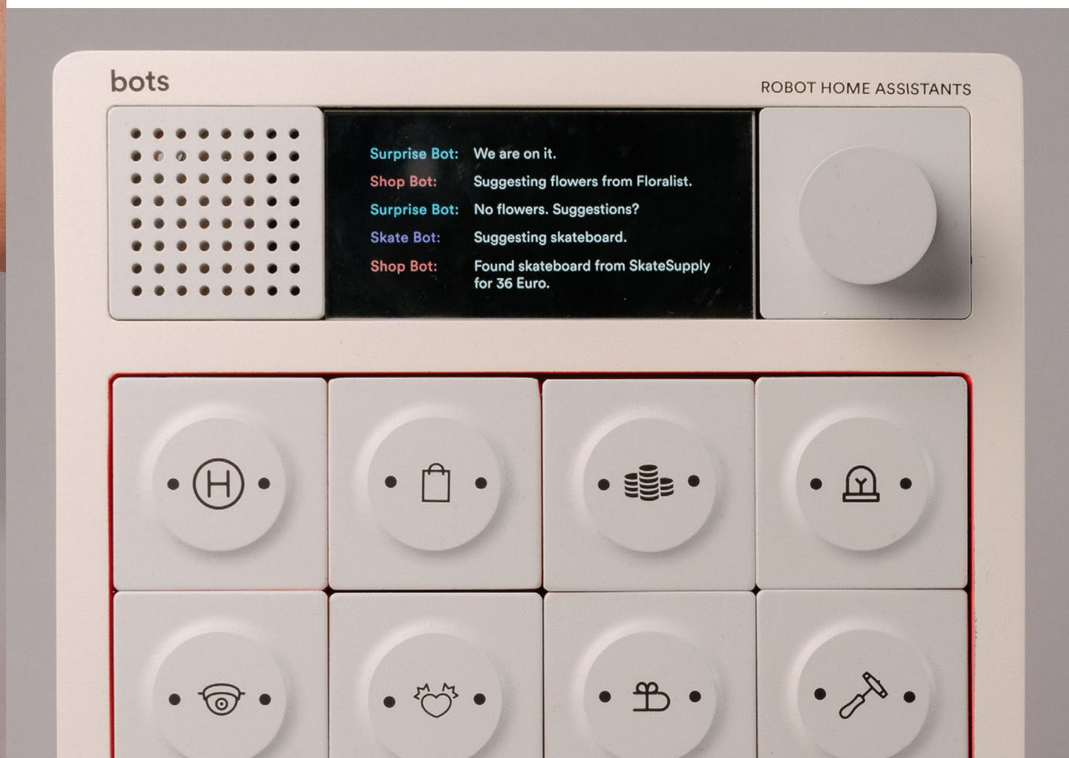
The brain is the central unit of the system. Only bots placed in one of its 16 slots are considered active. The reason for this limitation is that too many collaborating bots make the system unstable - just as pack animals usually have a certain amount of animals in their group.

Apart from controlling which bots can collaborate with each other, it also provides the means to directly address the system. Users can automatically address the appropriate bot by refering to them in the plural (e.g. ‘Hey bots’ or ‘Hey guys!’). Additionally, when any bot is depressed, it will announce it’s name and purpose through the built-in speaker.

A screen on the top of the product allows users to browse through the history of the bots conversations. It is imaginable that this is especially necessary when trust in the system needs to be established or when troubleshooting an unwanted behaviour.



THE SENSES

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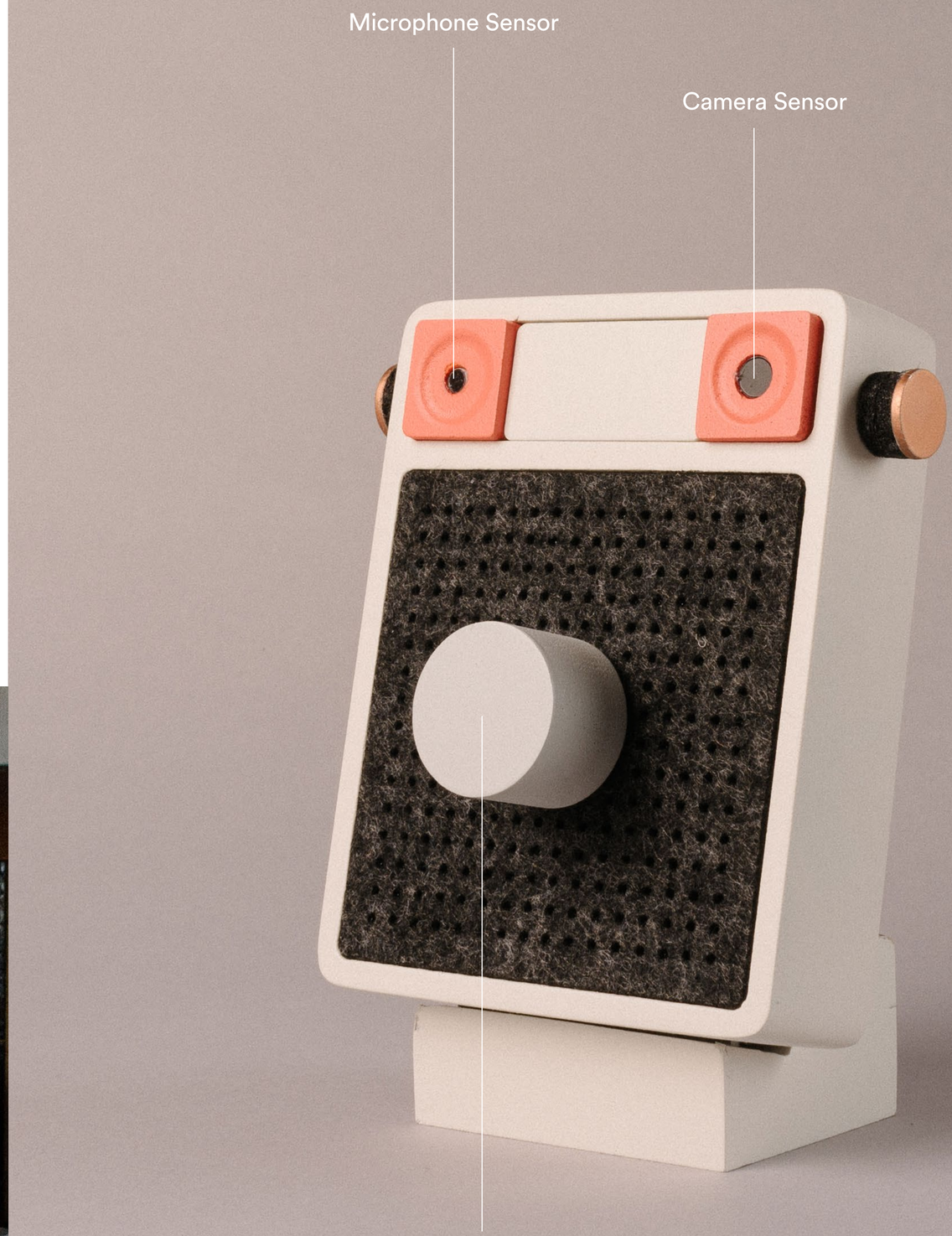
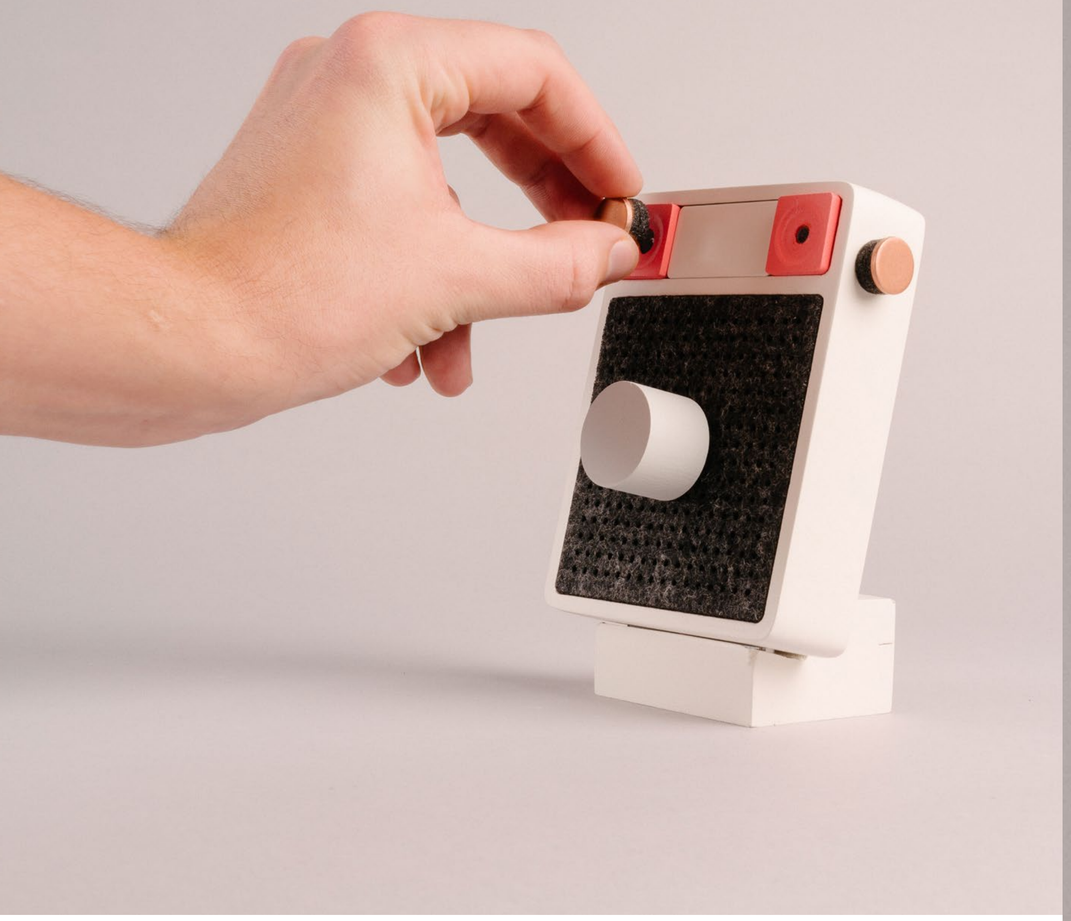
A Sense consists of a loudspeaker and a microphone and allows bots to be addressed in rooms different from where the main unit is. Each Sense can also have additional embedded sensors (e.g. a camera or a movement sensor).

A visual EQ lights up behind the speaker holes when a bot is speaking through a Sense. A pulsing pattern appears when a bot is waiting for a reply through the Sense.





PRIVACY CONTROLS

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Inspired by how people use Post-its or tape to cover up the camera on their laptops, each sensor in Sense also comes with a signal blocker. Place the signal blocker in-front of the sensor in situations where more privacy is needed. The sensor blockers attach magnetically to the sensors and the side of the device.

OPEN QUESTIONS

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Should technology assume the role of a caregiver? Or should designers focus on building better senior care systems?

Will this design contribute to further isolation of elderly people? And what role does failure in the AI have a direct effect on the mental wellbeing of the user?

How might the system communicate with other similar systems?

Can you gift bots to other users? How much of your behaviour are you encoding into them?

Is there a way of creating your own bots? And if so, how might this be appropriated for use cases not forseen by the designer?

PROCESS

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This 10 week project purposefully diverted from the traditional user centred design process in a couple of ways. For one, this project's aim was to propose a design fiction that includes an actual design concept. This made the research phase of this project pivot more towards artistic research and finding unexplored opportunities rather than about discovering a practical design problem.

Through creative writing exercises – and research about current trends – a future was imagined and explored. This eventually resulted in the design fiction text (see Appendix). The interesting thing about this approach was that it allowed for the design to partially emerge from the situation in which the character found themselves. The design fiction approach allowed for it to be turned into film scripts relatively easily. The short films were then produced in the home of a 86 year old from Umeå. This added a lot of believability to the final concept.

To counteract the possibility of the designs to act merely as props in the fiction, they were developed in parallel to the design fiction.

The decision to design physical artefacts was made early in the process. It was motivated by approach of the design studio BERG to their design fiction projects to make the fictional objects feel as real as possible. Additionally, this allowed me to explore many traditional design skills that I was entirely unfamiliar with. To mention a couple of things done for the very first time: 3D modelling something to be made later, milling, handling red PU foam, sanding and priming, painting using a spray booth and product photography using a photo studio setup. The designs went through multiple iterations.

The final two weeks were reserved for filmmaking, editing, final model production and preparations for the exhibition.

The following pages show a couple of noteworthy activities in the process.

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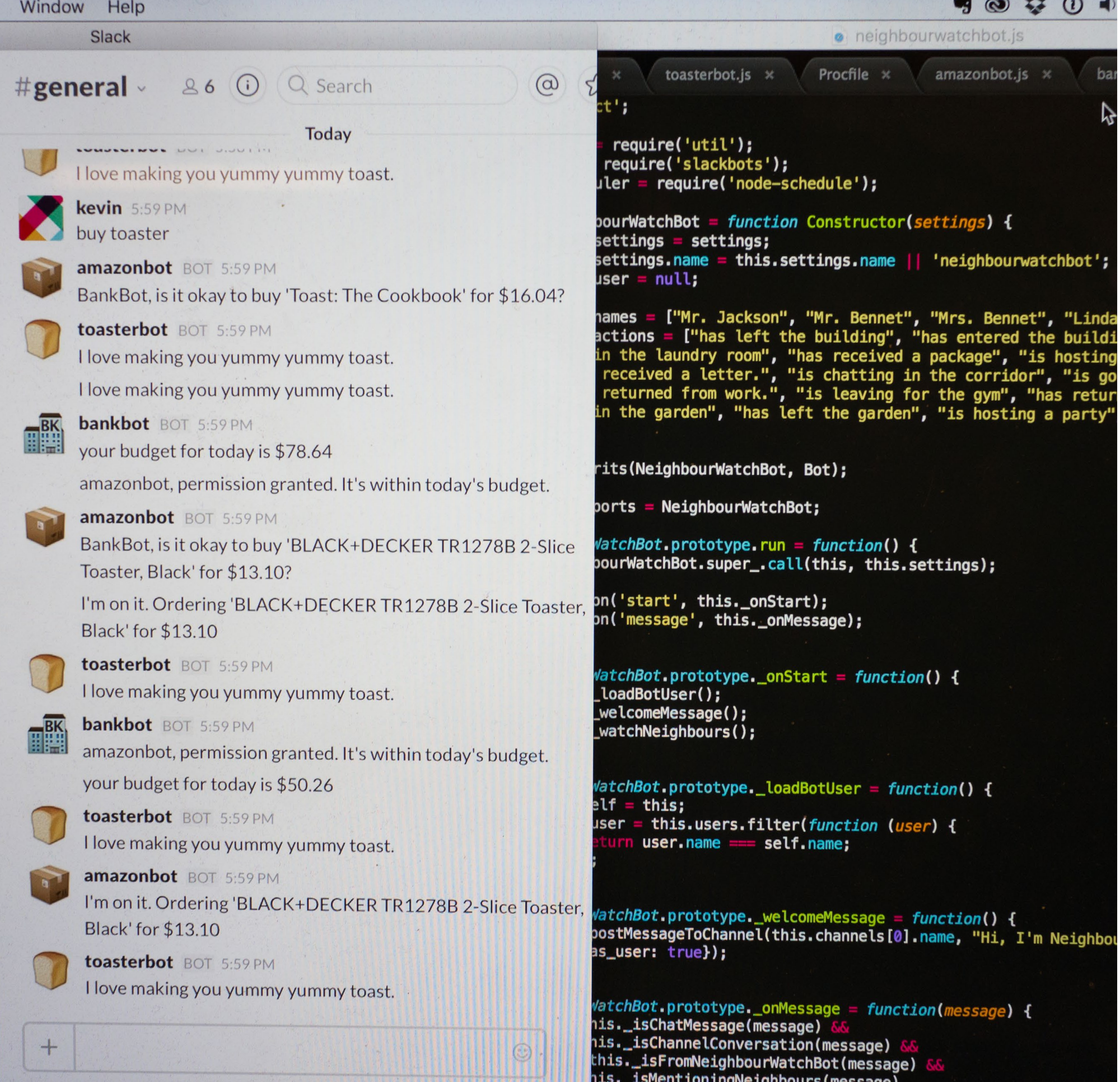

VIRTUAL SMART-HOME PROTOYPE WITH SLACKBOTS

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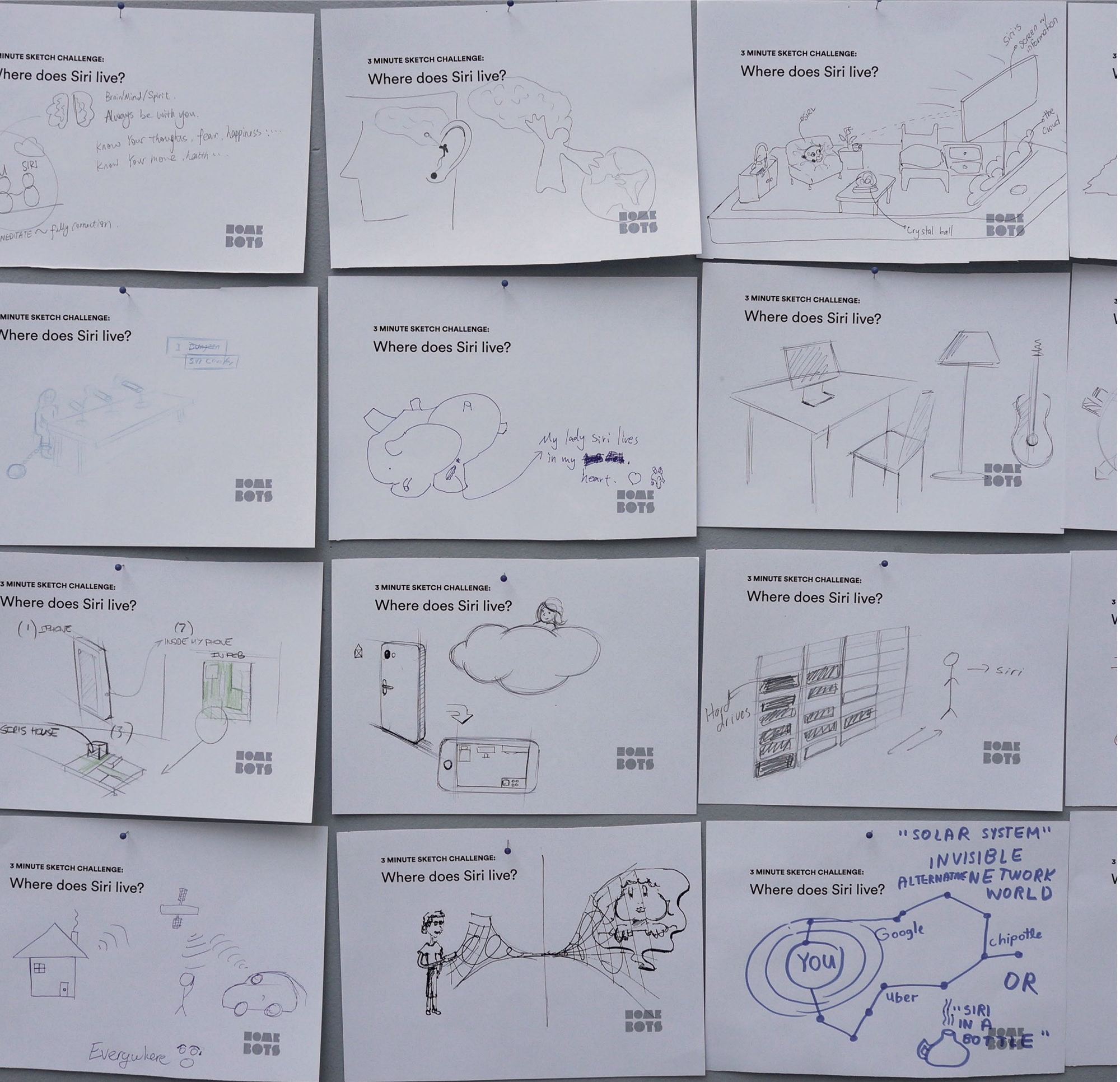
To get a feeling of what collaborating bots might be like, I decided to try a new approach using the collaboration platform Slack. In Slack, users can invite so-called Slackbots to any conversation stream. It turned out creating my own Slackbots could be achieved using a couple of hundred lines of Ruby code.

So to emulate a future smart-home I decided to program multiple Slackbots that would pick up on certain key phrases. For instance, when the user states his intention to buy a toaster, Amazon bot picks up on the word ‘buy’. It then looks the top product in Amazons catalogue is and asks Bank bot for permission to purchase it. A simple Toaster Bot merely picks up whenever the word toast is uttered and exclaims its enthusiasm for it. An unexpected consequence of this exercise was getting weekly summary emails of what my smart home was up to.

This exercise helped me understand the right level of intelligence vs stupidity of the bots I was going to propose in my final design.



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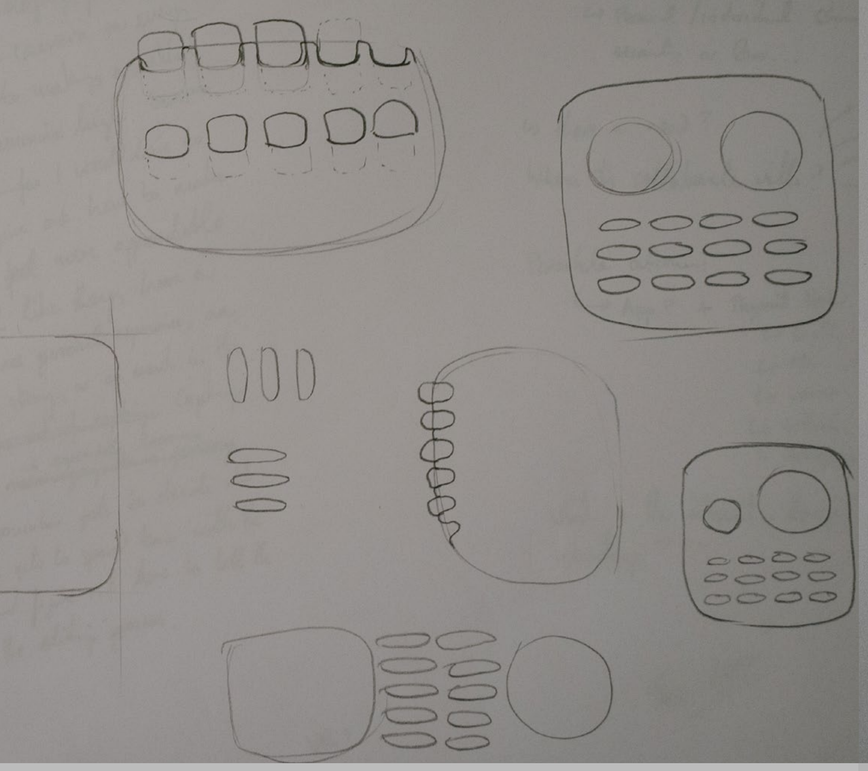
SKETCH EXERCISE ‘WHERE DOES SIRI LIVE’?

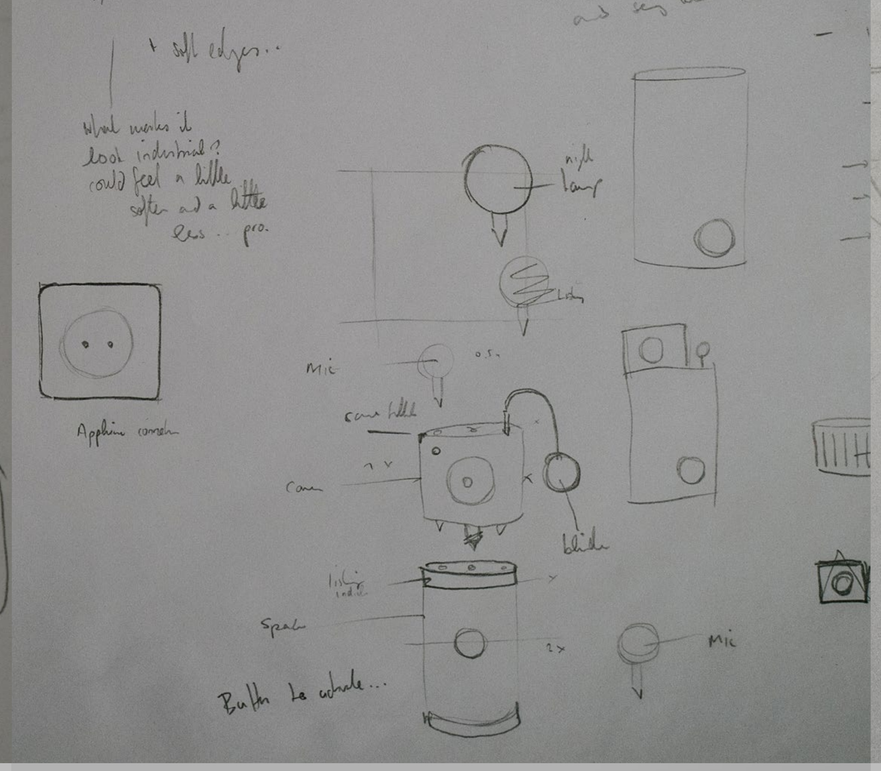
–

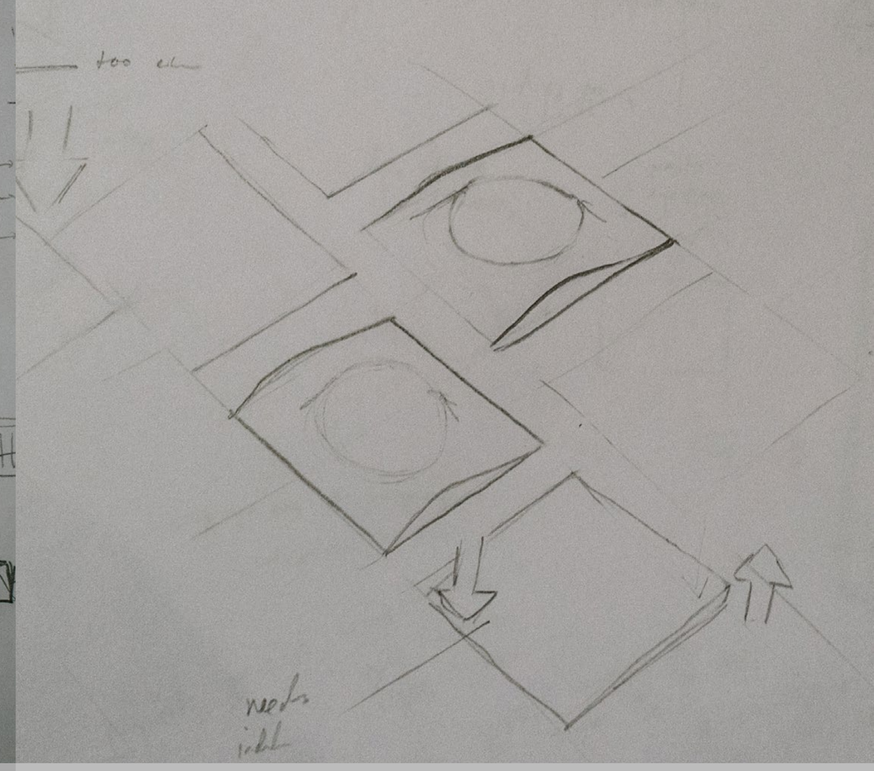
During the start of the project I was intrigued by how people thought about their virtual assistants. I decided to offer 20 design students in the Masters programme a Swedish Punschrulle in exchange for their participation in a 3 Minute sketch challenge. In it I asked them to draw me where Apple’s virtual assistant Siri lived.

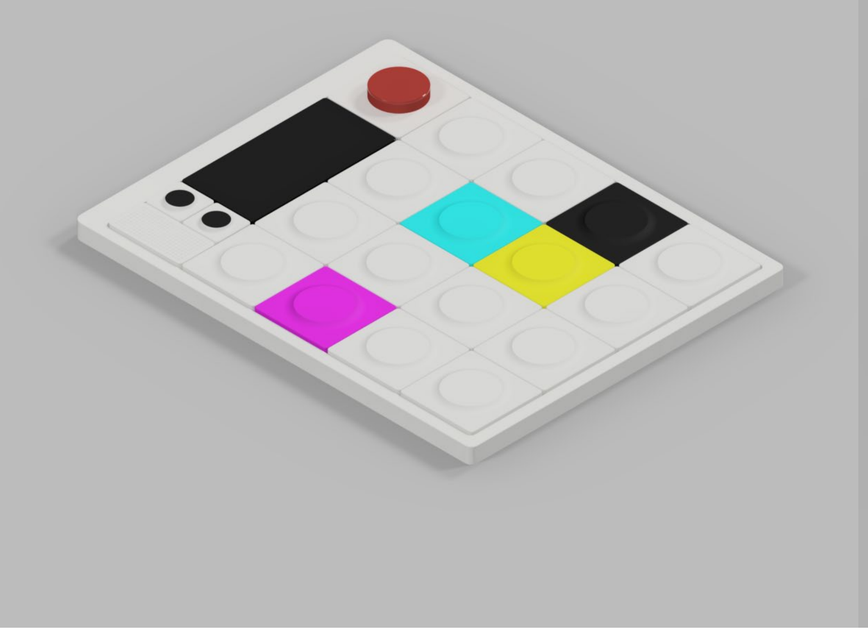
I received many different ideas about Siri’s home, but broadly speaking they either referred to a specific place (inside an object) or inbetween objects.

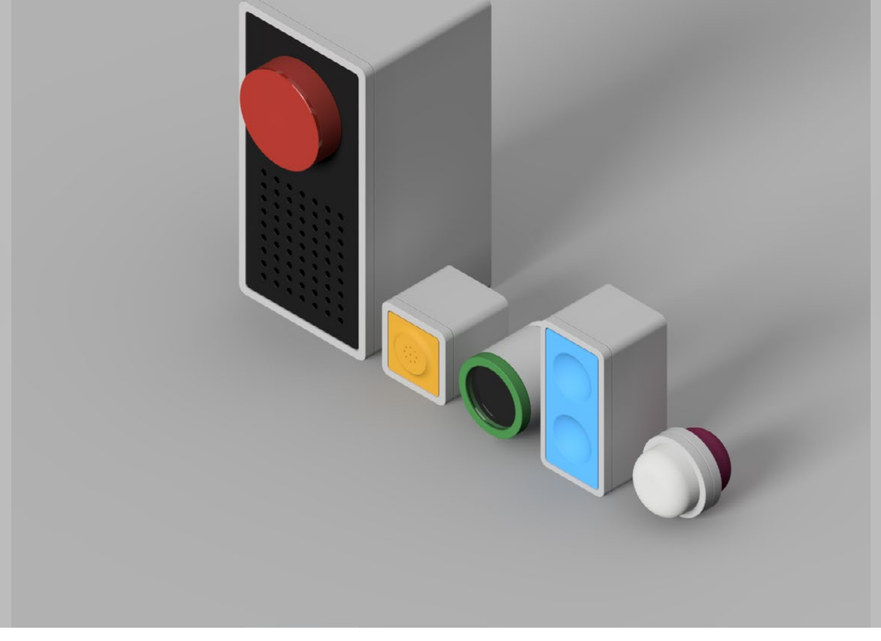
While nothing directly came of the exercise, I thought it was interesting nevertheless.

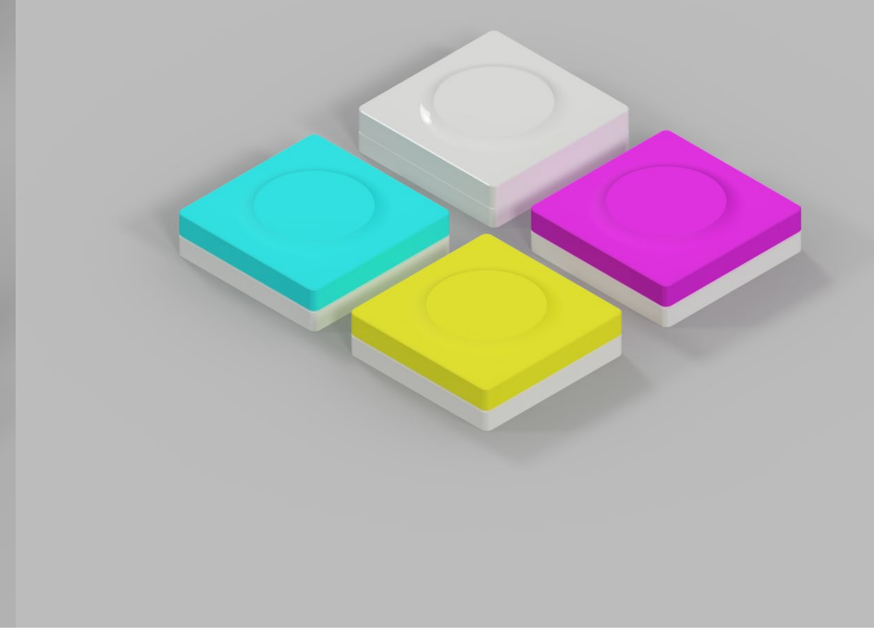




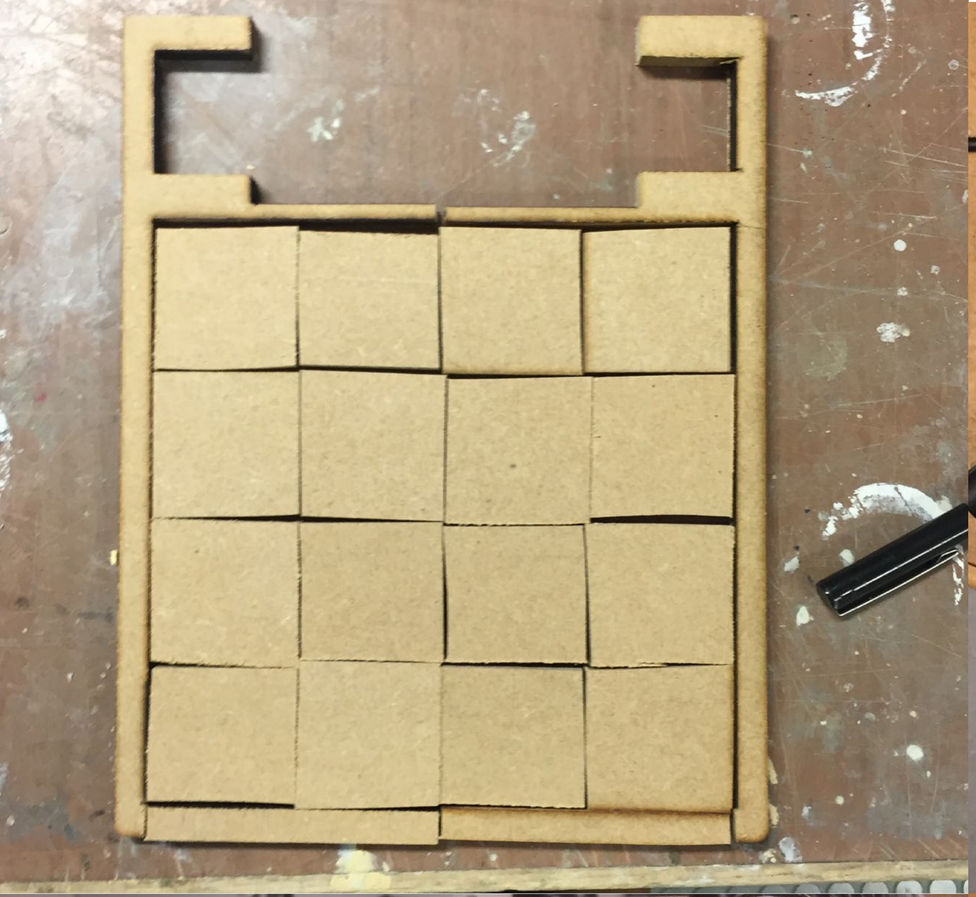


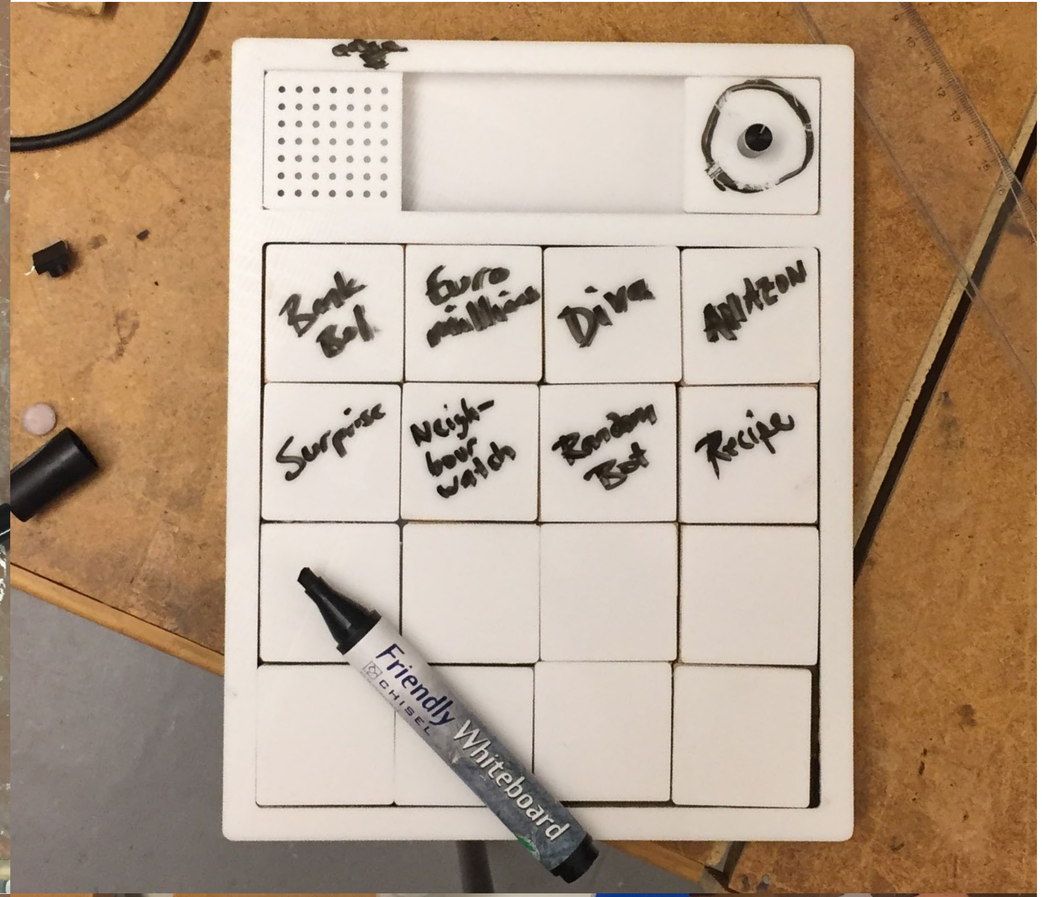


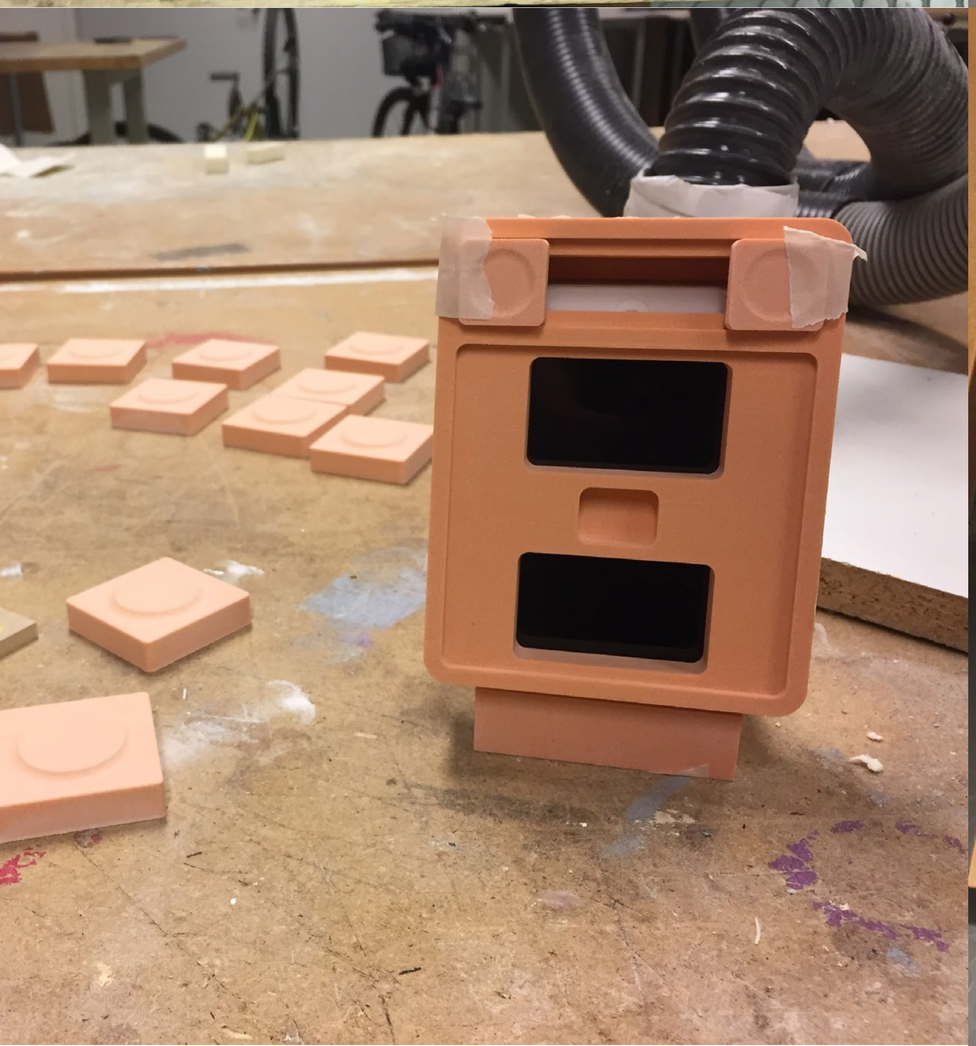




Comparison of the very first sketches for each system component to the early 3D models presented at the project's mid-presentation.







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A first prototype was cut out of MDF and then finished with lasercut acrylic. The purpose of the prototype was to make sure the individual bots would be easy to replace. By building a real model I was able to figure out the margins needed for the magnetic button mechanism that holds each bot in place once the model is mounted on the wall. The surface afforded trying out different bots and testing interactions by just labelling them differently

The decision to build slots to insert iPhone's and iPod directly into the final model came initially from the idea that using the devices sensors and screens was going to be easier than building them using Arduino components.

The size of the devices (especially their bezels and depth) influenced how the final designes looked like. Their screen size also directly influenced the size of the grid for the Brain component and therefore the size of the Bots.

Later in the project, it turned out to be the right decision: since building the model took more time than expected, I needed to scale back my ideas of making the voice interfaces functional. Since I already had the devices in place, I just decided to loop prerendered videos showing what such an interface might look like.

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Final models at Faceless
Interaction exhibition at Humlab-X
on Monday, 14. December 2015

APPENDIX

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A1 Catalog of bots

B1 Scenario 1: Ada’s Surprise
B2 Scenario 2: Neighbours
B3 Scenario 3: Memoriam

C1 Design Fiction Text:
Overheard on the Hyperloop

D1 Contact Information
E1 Credits
F1 Acknowledgements

A1 BOT CATALOGUE

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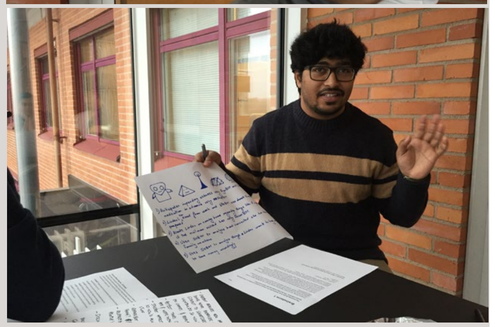
The following bots were invented during the course of the project. Most of them were a direct result from a workshop with 5 participants in week 2.



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Memory Bot

Social Bot

Diet Bot

Etiquette Bot

Emergency Bot

Bank Bot

Recipe Bot

Security Bot

Neighbour Bot

Revenge Bot

Challenge Bot

Gym Bot

Surprise Bot

Lottery Bot

Meditation Bot

Diva Bot

Puzzle Bot

Transport Bot

Skate Bot

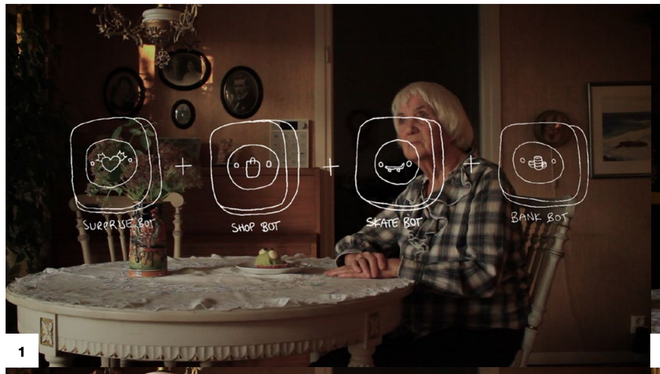
Care Bot

Random Bot

Preference Bot

Shop Bot

Tech Support Bot



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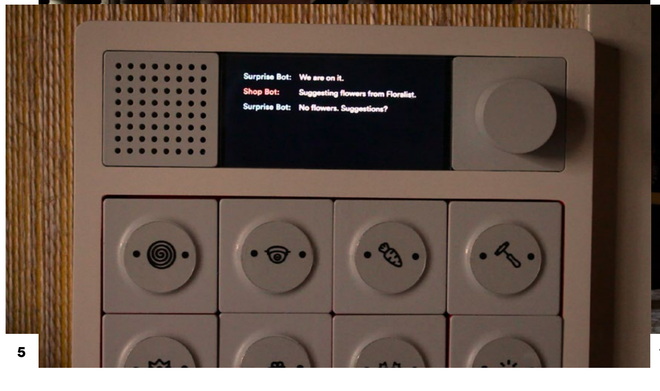

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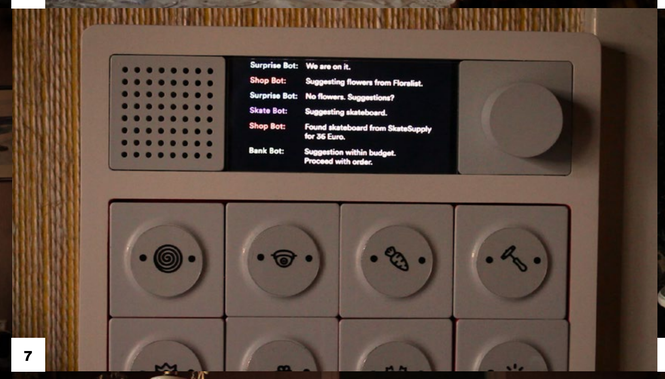

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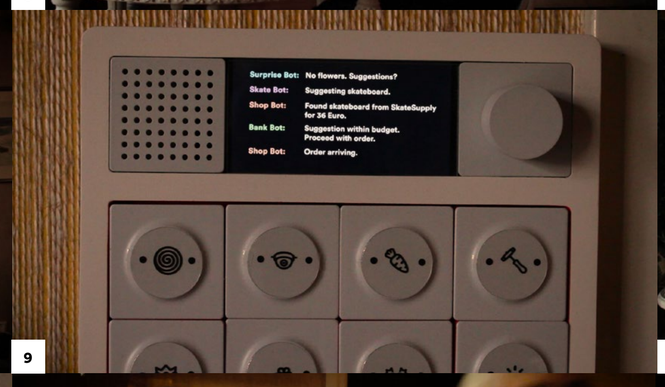

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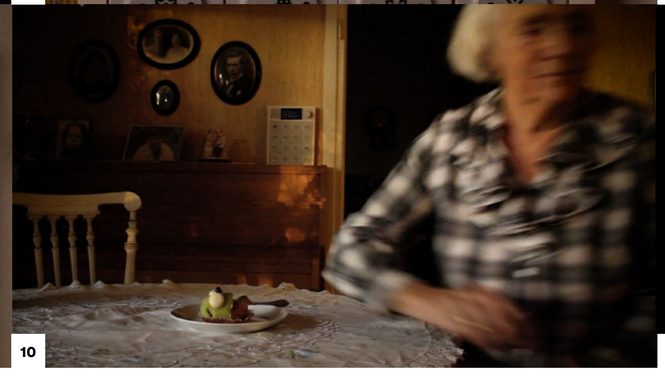
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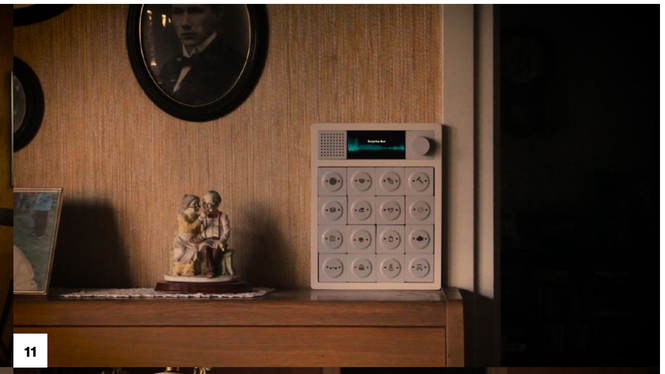
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B1 SCENARIO 1: ADA'S SURPRISE

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Ada asks her bots to organise a surprise for her. Immediately, Surprise Bot springs into action an collaborates with Shop Bot, Skate Bot and Bank Bot to order something exciting within her monthly budget allowance. Minutes later Ada is unwrapping a new Skateboard for her collection.

B2 SCENARIO 2: NEIGHBOURS

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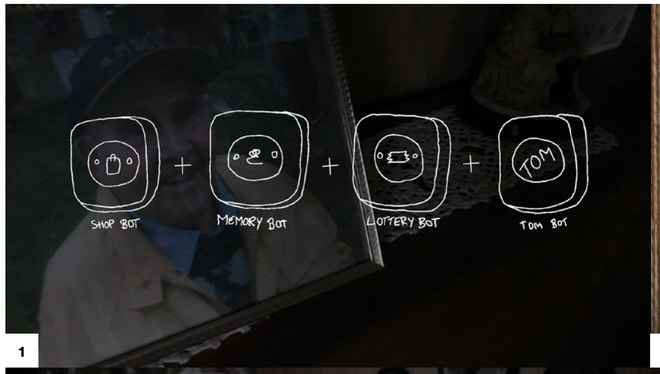
Just as Ada plans to go out, Neighbourwatch Bot informs her about her neighbours arrival. Clearly rattled by the situation, Ada decides to pretend she isn't at home. Insurance Bot nearly blows her disguise by informing her about the possibility of ice outside. But luckily Ada's visitor leaves none the wiser.



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B3 SCENARIO 3: MEMORIAM

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Ada receives a new bot by mail. This one has Tom handwritten accross the top. She faces the difficult decision which of her bots to remove. Neither Shop Bot nor Memory Bot are repaceable for now. But Lottery Bot, which has been playing the lottery for Ada every day, is the easy target. As Ada places Tom Bot in the main console, it states its purpose: to imitate the antics of her late husband around the house.

C1 DESIGN FICTION TEXT: OVERHEARD IN THE HYPERLOOP

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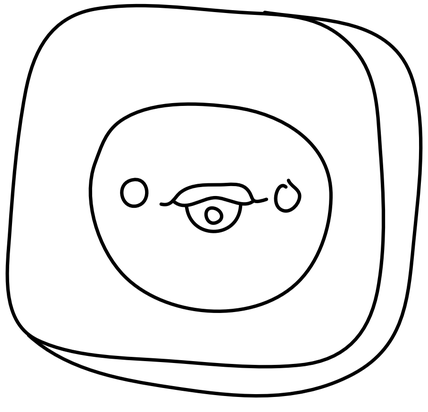
“Yesterday I saw my neighbour Ada for the first time in two months. She’s ignoring me! And she seemed to be in a hurry, even stressed. Her usually so well kempt white hair looked unwashed from afar. And she called me Mrs. Bucket. Can you believe that? After all those years! God knows what the poor soul is up to. Probably going on shopping trips again. Like if there was any place left to go. She had bags with her and everything. Lost her marbles, I say. Lea from downstairs says she still gets those liquorice candies her husband used to like. Not once has she even tried one. Not once! Poor soul.

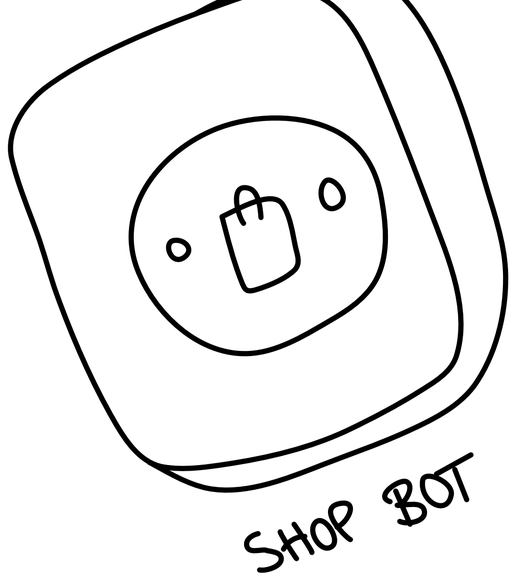


I sure wish I could help, but what can you do? Her family has passed, you see. Terrible story, the whole thing. But she’s been fine up until recently. Something must’ve happened.

Things have been going better in the neighbourhood, too. It’s not as crowded as it used to be. And the police have finally cracked down on the horrible service attacks. So what happened was that some punks handed out pirated artificial intelligences all over the block. Yes, yes, other places, too, I know. But here it was the worst! The worst! It was on the news! Anyways, people were curious what they were and put them into their brains. No not their actual brains. The thing on the wall they call ‘the brain’. Yes, where you put the artificial intelligences to make them work.

ANYWAYS, I was saying. The pirated artificial intelligences then reprogrammed the behaviour of the other artificial intelligences to do things they shouldn’t. So, Betty – you know Betty, right? – had her stove go on at night. And Alice had one thousand pizzas ordered. Like a thousand. Yes. I’m telling you. That’s all the drones south of 9th Street.

Others had it worse. Instead of the cleaners, they found themselves opening their door to masked robbers with high precision tasers. Imagine that! I’m sure that happened more than the police admits it did.

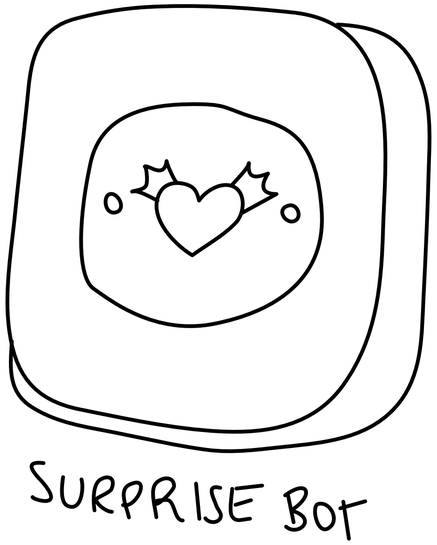


Now everybody is better. There’s a new version of the security AI that the landlords have been handing out and the police reminded us not to use any unofficial artificial intelligences anymore. Just check the hologram, alright!

What else was there? Ah so, supposedly, Sophie has an Exclusive-Bot. Bot. Yes. That’s what the artificial intelligences are called. I know you’ll come around in the end - it’s really not that complicated. ANYWAYS! So Sophie has one of them. No, nobody knows what they do. That’s the point! There are only a couple of hundred of them in the world. She must’ve paid a fortune. I hope she’ll figure out what it does, though. Can’t believe that caught on. When they announced them, I thought like it was going to be the biggest failure since the cloud. Remember the cloud? Yeah. Hm.

I’m thinking of getting one as well. No, not a Exclusive-Bot. A normal one. Oh come on, a new bot a month is hardly an addiction. I read about this fun bot called Neighbourwatch-Bot a couple of months ago. It watches what your neighbours are doing. Sounds fun, right? Like when they are using the laundry room. Yes, really. Maybe I’ll give that one a try. At least to check in on Ada. Poor soul!

Okay. I’ll tell him when I see him. Talk soon! Bus bus!”



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Umeå Institute of Design
Umeå University

D1 CONTACT INFORMATION

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If you have further questions about this project, please don't hesitate to reach out to:

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@kvngnt

E1 CREDITS

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The iconography shown on the face of each bot was created by Sergey Demushkin and was retrieved from the Noun Project on December 1st 2015.

The music featured in the short film was written and composed by Mychael Danna and Rob Simonsen and was released as The Score from the Motion Picture 500 days of summer.

F1 ACKNOWLEDGEMENTS

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Thanks to the many people who helped me along the way of this 10 week individual project 'Dwelling with Faceless Interaction' at UID in Fall 2015. Some that come to mind:

Gun-Britt Grönborg (actress)

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Martin Gärdemalm (tutor)
Niklas Andersson (tutor)
Rickard Åström (tutor)
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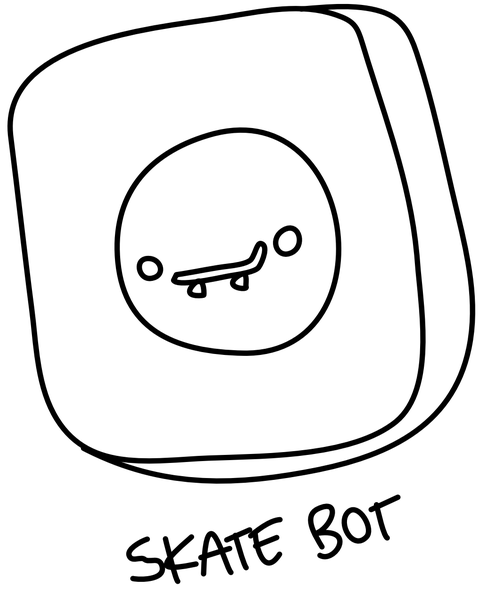
Lina Trulsson
Madyana Torres de Souza
Jost Siebert
Joakim Bergbom
Maja Hedlund
Regimantas Vegele
James McIntyre
Jiaojiao Xu
Júlia Nacsa



bots
HOME ROBOT
ASSISTANTS