RWTH AACHEN UNIVERSITY

Fly Remote
Reciting canvas presentations with an iPad

by
Claude Bemtgen

I hereby declare that I have created this work completely on my own and used no other sources or tools than the ones listed, and that I have marked any citations accordingly.

Hiermit versichere ich, dass ich die vorliegende Arbeit selbständig verfasst und keine anderen als die angegebenen Quellen und Hilfsmittel benutzt sowie Zitate kenntlich gemacht habe.

Aachen, MONTH YEAR
YOUR NAME

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Abstract

From the moment where it became customary to rely on presentation software to facilitate own talks, slide presentations have been the standard visualization technique. However, during the last five years, canvas presentations have become more and more popular. One tool to create such presentations is Fly, which is currently being developed at the RWTH Aachen university. To make better use of its zoomable user interface, it is extended by its mobile version – Fly Remote.

Fly Remote should give the user more freedom during her talk and not bound her to a stationary computer, so she could better face the audience and appear more enthusiastic. Therefore, the interface of the application had to be well planed. In two iterative phases, I tried to constantly improve the program, so that the presenter could make good use of all the natural gestures like pinching, sliding, tapping, etc., without concentrating too much on what she is doing and focus more on what she is saying.

Überblick

Seitdem es immer üblicher wird, Präsentationsprogramme zu benutzen, um den Zuhörern auch visuelles Feedback während einer Präsentation zu gewährleisten, hat man meist die Technik einzelner Folien benutzt, die nach und nach eingeblendet werden. Doch in den letzten fünf Jahren wurden sogenannte "canvas presentations" immer populärer. Eins dieser Programme, welches an der RWTH Aachen entwickelt wurde, heißt Fly. Um allerdings besseren Gebrauch von dessen Schnittstelle zu ermöglichen, kam die Idee auf, Fly um ein mobiles Programm zu erweitern – Fly Remote.

Fly Remote soll vor allem der Benutzerin mehr Freiheit während ihrer Rede ermöglichen, und sie nicht an einen stationären Rechner binden. Dies hat den Vorteil, dass sie viel selbstsicherer und begeisterter auftreten kann und somit die Zuhörer auch viel interessierter zuhören. Damit sie dann aber nicht durch ihre technische Ausstattung zu sehr abgelenkt wird, wurde der Aufbau der Schnittstelle genauestens durchdacht. In zwei iterativen Phasen wurde das Programm ständig verbessert um beim Navigieren einen besseren Gebrauch von natürlichen Gesten zu ermöglichen. Im besten Fall soll die Rednerin sich nämlich auf das konzentrieren, was sie sagt, und nicht was sie tut.

Acknowledgements

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Last but not least, I would like to thank Ivan S. for the great times we had together in and out of his office.

Conventions

Throughout this thesis we use the following conventions.

Text conventions

The whole thesis is written in American English.

Unidentified third persons are always described in feminine form. This is only done for purposes of courtesy.

Definitions of technical terms or short excursus are set off in colored boxes.

> **EXCURSUS:**
> Excursus are detailed discussions of a particular point in a book, usually in an appendix, or digressions in a written text.

Definition: *Excursus*

Chapter 1

Introduction

In 2007, Thorsten Karrer and Leonhard Lichtschlag started
the development of a new presentation tool at the RWTH
Aachen University, called *Fly*. They had the idea of a new
way of composing presentations. Leaving the classical ap-
proach of a slideshow behind, they imagined a planar inter-
face for authoring presentations, which is not based on the
slide metaphor but allows authors to freely lay out infor-
mation on a plane in a map-like fashion(Lichtschlag et al.
[2009]). The concept behind this is that items which belong
together should also be placed close to each other. This will
help the audience to see the different connections between
these elements, and make it easier for them to follow the
presenter. Studies have shown that this kind of present-
ing is easily grasped by the users, and leads to presenta-
tions more closely resembling the information structure of
the original content (Lichtschlag [2008]).

Everything
started with Fly

Over the years, a number of improvements have been un-
dertaken, so that the repertoire of features which support
the user during the composition and the reciting of her pre-
sentation, could be increased. With these increments, the
need for an adapted remote controller also gained more
and more importance. A normal *clicker remote* would not
be sufficient anymore to make use of all the provided char-
acteristics of Fly.

> **CLICKER REMOTE:**
> A clicker remote is a simplified remote controller, which is used to control a presentation currently running on a computer. Usually it consists of two parts – the transceiver, which is plugged into the USB slot of the computer, and the transmitter, which is carried around with the user. A typical transmitter has at least a forward-, a backward-, and a laser-button, but most of them are equipped with a lot more functions. A comparison of different clicker remotes can be found in Appendix B.

Fly Remote is a stand-alone software

Therefore, the expansion of the desktop version of Fly by a mobile one – *Fly Remote* – was only a question of time. At first, I had the choice between a linked application, which allows the user to control a presentation that is actually running on a computer, or an application that can run on its own; and because of the fact that a presenter usually carries either a laptop or a pad with her but rarely both, I decided upon the latter alternative. So Fly Remote is an application, designed for the iPad, which allows the user to show the presentations that she created with Fly in advance and then synchronized, using either Apple's iCloud service or iTunes , on the mobile device. Figure 1.1 shows the landscape view of a sample presentation that is currently running on the iPad.

Because of the fact that talking in front of a crowd is already considered as a stressful situation (Moscovich et al.), the application should not reinforce this tension. This is why the task was not only to create a program which satisfies all the needs of the user and does not neglect the functionality of Fly, but also to make its use as natural as possible, because presenters should focus on their talk and not on the equipment they use. At the beginning I did some thinking on my own, implemented a prototype, and asked some random people about their opinion. Based on this feedback, I then built the first real version of Fly Remote. Ultimately, I tested it in a contextual situation to analyze the remaining problems of my application.

Figure 1.1: An example of a Fly presentation running on the iPad. On top, there is the button area to navigate through the presentation. The white surface below is the actual presentation area, and between these two areas, you can see your own notes.

1.1 Chapter overview

Chapter 2: Background

This chapter will give an overview of the different presentation techniques, starting in medieval times, where storytellers roamed the estates telling fairy tales, over the classical presentation tools as Microsoft's Powerpoint or Apple's Keynote, until the appearance of new kinds of presentations namely canvas presentations like Prezi or Fly.

Chapter 3: Preliminary work

These are my own reflections I had before starting to implement the software. I looked at existing remote controllers

for presentations and imagined how people would interact with an iPad during a talk, in order to create the user interface according to the needs of the presenter.

Chapter 4: Related work

In this chapter, I examine existing software which are similar to my work. I divided my research into applications for the iPhone and applications for the iPad. On one hand, I tried to detect nice ideas that could be helpful for my work, but on the other hand, I also tried to uncover eventual flaws that should prevent me from doing the same mistakes.

Chapter 5: First iteration

This chapter can be seen as the development of my first working prototype. In order to gain a first feedback, I handed it to a few of my colleagues and asked them to tell me what they think of the software.

Chapter 6: Second iteration

Based on this feedback I got in chapter 5, I improved my application until I reached a point where I was satisfied about my work.

Chapter 7: User test

Again, I wanted to see how my final product is grasped by some users. I did a more complex study, where I taped the testers from two different point of views. After giving a short example talk I asked them to fill out a small questionnaire, so I could get a first subjective feedback. The records then helped me find problems the participants did not think of anymore or did not recognize at all.

Chapter 8: Summary and future work

Finally, I will point out again the most important points of my work, and I will provide a few ideas about things that can still be done in the future in order to make the software more powerful and more user friendly.

Chapter 2

Background

Being able to give a good talk was already a major goal in Greek and Roman times. One of the main virtues a cultured man was supposed to possess, was the ability of reciting in an elegant way. Therefore, Plotius Gallus, a Latin rhetorician, opened the first declaiming school in Rome (Polo [1996]). Its main goal was to prepare young boys for leadership roles. During rhetoric lessons, they were introduced to the art of speaking convincingly in public places and other useful skills for a career as a member of the republic.

Giving a good talk is an old task

Over the centuries, the art of oratory developed more and more, so that in the Middle Ages the era of the storytellers had its beginning (Crosby [1936]). A storyteller was a narrator, who traveled from town to town, from market place to market place, from castle to castle, reciting his self-penned writings. The more popular he was, the more money he could ask to offer his skills, so he always tried to be as impressive as possible, in order to increase his reputation. Good tellers difference from the rest, as they were able to modify their stories according to a specific region. However, their main challenges were not only to write fictive tales or poems with topical subjects, but also to present these in market places or even in royal courts.

In the Middle Ages, storytellers were very popular

Even if the goals and subjects of a presenter changed until the beginning of the nineteenth century, the appearance of

Figure 2.1: A painting of a storyteller. (Artist: Georg Bergmann)

the presenter almost remained the same. The main priorities have always been the speaker's performance and his eloquence, but instead of reciting some impressive tales, the primary goal was now to transmit acquired knowledge. With the invention of the blackboard, presenters could now use visual aids to underline the most important parts (Figure 2.2 a). This had the advantage that the listeners can use the left hemisphere of the brain to memorize the auditive information, and the right hemisphere to memorize the visual information (Weidenmann [2008]).

Blackboards are helpful to provide visual information

Soon the idea came up to prepare the visual feedback already in advance. When the technological know-how was not developed yet, the talker usually wrote the main points on some bigger pages which he could change during the presentation. This is still known today under the name of *flip-chart*, with the only difference that today it is mainly used to write down spontaneous notes during the presentation. (Figure 2.2 b)

Finally the biggest changes took place in the 20th century, when technology started to grow dramatically. With these changes, "anyone presenting information should rethink their concepts about how and why information is presented" (Tufte [1997]). Initially speakers fell back on slide projectors which displayed the content of 35 mm diapositives (Figure 2.2 c). This was still quite complicated, as the user had to arrange snippets and drawings and take a picture of them in order to get the slide she could use later on. A much easier way to display images, was first used in World War II. The US army used a new kind of projector which used a bright lamp to screen the content of transparencies on a bright surface, mostly a white wall. This was the birth of the overhead projector as we still know it today (Figure 2.2 d). This kind of projector enables the speaker to use pre-built transparent foils and furthermore, allows her the freedom to add her own keywords on the fly.

The overhead projector was first used in World War II

However, this was nothing compared to the milestone that was set by Microsoft's presentation tool Powerpoint. In the 1980s, two programmers wrote a program that allowed the user create his own slides on a computer. Originally it was called "Presenter" and designed for Macintosh but Microsoft bought the license and added it to its office package. The idea is pretty simple. The speaker can create his slides in advance and project them on the wall behind him while talking about her topic. By using her keyboard, she can now navigate through her presentation. During the following years the software became more and more sophisticated, allowing for example multiple slide transitions or the import of music and videos.

Microsoft's Powerpoint sets a milestone in the 80's

Inspired by the TV remote controller that had been invented four decades before, firms started developing clicker remotes that covered all the needs of the presenters. At the beginning these needs consisted of a small and handy stick, with which they could jump to the next or the previous slide. Aside from this, a common accessory was a laser pointer that allowed the user to highlight something interesting by illuminating it with a small bright spot of colored light. Over the years, the users became more demanding, and new features had to be added. With the appearance of smart-phones, there were also remote controller apps that released the need of an individual clicker

Clicker remotes should give the presenter more free space

Figure 2.2: Some older helping inventions to give a talk. a) a typical blackboard - b) a flip-chart - c) a 35 mm diapositive projector - d) an overhead projector

remote. The advantage of a smart-phone is, that it can also provide visual feedback to the presenter, but unfortunately it has no haptic one. A small study about this new form of remote controllers can be found in chapter 4.

Presentation software became more and more popular, and so did all its varieties. Critics found the typical slide pre-
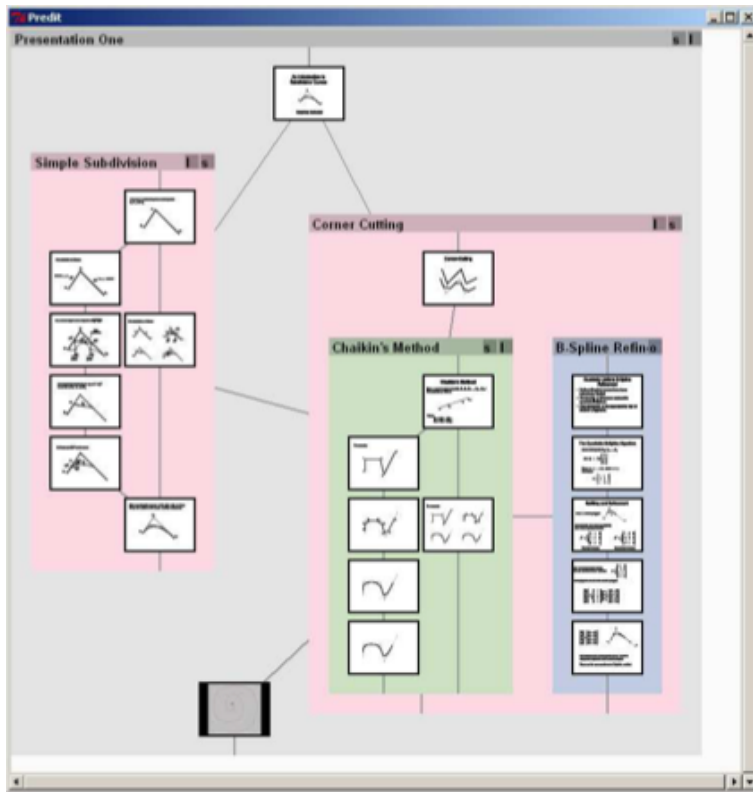
Figure 2.3: The private presenter's view of a presentation that can take many different routes according to audience demands (Moscovich et al.).

sentation style too stiff. Doumont [2005] demonstrates that "these slides are ineffective, often detracting from what presenters are saying instead of enhancing their presentations". Instead of the one-dimensional timeline, the idea came up to use a two-dimensional canvas view. First, they still held on to the idea of the slides but arranged them in a tree-like way, so that at some specific points, the user could choose between different routes (Figure 2.3). Inspired by concept maps, which are often used for brain-storming and which have been used as a tool to increase meaningful learning, developers created zooming user interfaces, also called ZUI's (Bederson [1994]). The slides were placed on a large area at varying distances from the virtual camera view point in the scene. By moving and zooming, it was now possible to jump from slide to slide, arranged in a concept map, which facilitates a more effective use of cognitive

The appearance of zooming user interfaces
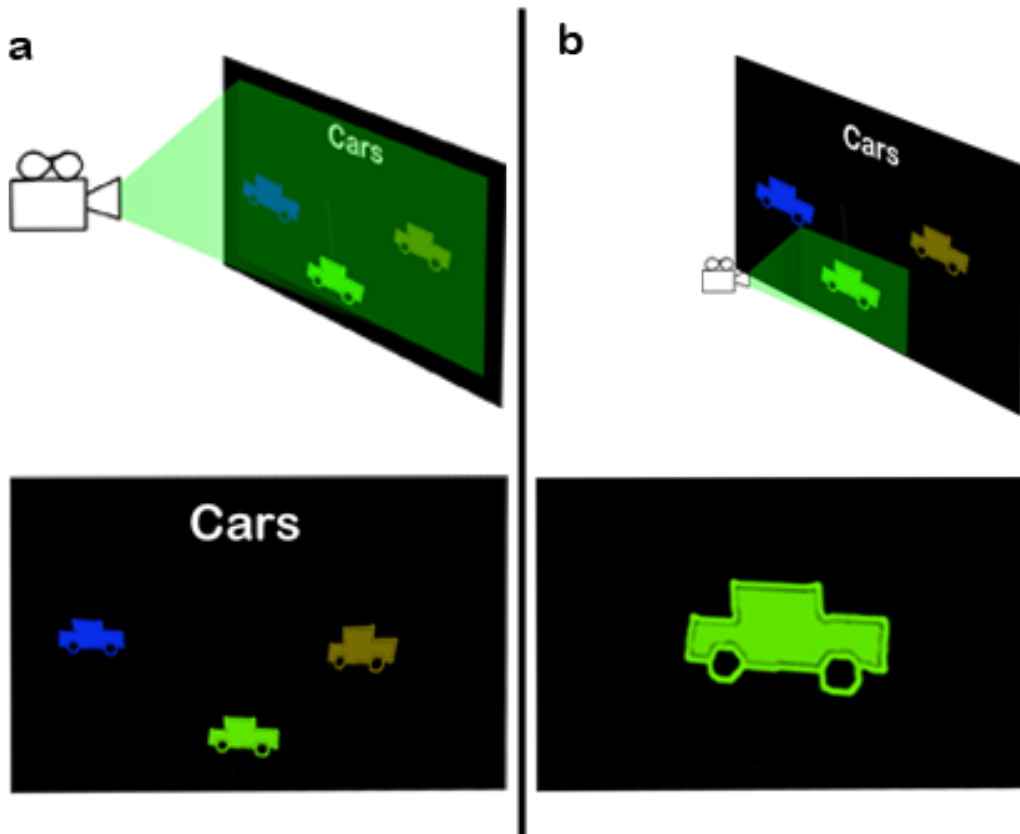
Figure 2.4: A sketch of the camera model. In *a*, the virtual camera zoomed out, to give an overview of the presentation. In *b*, the virtual camera zoomed in, to show a more detailed image.

resources (Good and Bederson [2002]).

Prezi is probably the most popular canvas presentation tool

Finally in 2007, Adam Somlai-Fischer, a Hungarian architect and interaction designer, started the development of a publicly-available ZUI editor that completely abandoned the idea of slides. Texts and pictures could be placed in a freely selectable size on an infinite big area. The presentations then consist of a visual map that let users zoom in and out and navigate within the content (Laufer et al. [2011]). The sketched figure 2.4 represents this new concept of a virtually zooming camera. This was the birth of Prezi [1], probably the most popular canvas presentation software.

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[1]www.prezi.com

> **Zooming user interface (ZUI):**
> ZUIs present information graphically and exploit people's innate spatial abilities. Detail can be shown without losing context, since the user can always rediscover context by zooming out. ZUIs use screen real estate effectively, and have great potential even on small screens. One way of thinking about ZUIs is that all the information you need is there if you look closely enough. (Bederson and Meyer [1998])

Definition:
Zooming user
interface (ZUI)

At the same time, Leonhard Lichtschlag and Thorsten Karrer from the RWTH Aachen University developed Fly, a similar presentation tool that brushes aside the idea of the classic slide presentations and instead uses a mental model which is grasped much easier by our brain. Figure 2.5 shows a screenshot of a sample presentation realized in the third version of Fly. It has to be noted that the developing process of the software includes 3 iterations.

Figure 2.5: The most recent version of Fly, which shows the presentation itself in the upper right part. The upper left part lists the 3 topics, and at the bottom, the path is represented by circles and arrows.

On an endless white surface, the user can add her own images and labels, and arbitrary topics can be created by

unifying some of these elements. When all the content has been added, the user can start creating the tour she wants the virtual camera to follow. To do this, she navigates to a certain position, presses the snapshot button, and a new stop is added to the tour. During the presentation, she has the choice between following her predefined path or leaving it and pilot over the presentation to spontaneous stops. Now imagine a speaker who realizes that time is running out, but she still has too many stops to present to her audience. With Fly she can now navigate to a specific position which, for example, shows the following 3 stops together. In a normal slide presentation this would not have been possible, and she would have rushed through the remaining slides confusing the audience by not letting them read all the bullet points. But what sounds so easy can still become quite a hard task for the presenter.

Giving a talk can
be stressful

Giving a talk is normally a very stressful task, especially for inexperienced presenters (Moscovich et al.). When running out of time or encountering an unexpected problem, this stress may turn into panic. And in such a situation, who will remember if turning the wheel of the mouse results in a vertical scroll or a zoom? Preventing such mishaps was only one of many reasons to create Fly Remote, the complementary software of Fly, running on the iPad.

Chapter 3

Preliminary work

As we saw in the previous chapter, presenting is already an old task and a lot of people have agonized over all possible ways to improve it. My research should help me find the differences between a good presentation and a bad one in order to improve the usability of my upcoming work. I not only read a lot of presentation guides, mostly blog entries about experienced presenters that want to transmit their collected knowledge to the rest of the world, but I also looked for papers which focused on the interaction between people and their tablets. Furthermore, a collection of a few not so ordinary clicker remotes should lead to ideas that are more out of the box and not considered in the literature.

Mostly, the hints you get from other speakers overlap, but there are also things that are matters of taste. For example some say that a laser pointer is absolutely necessary because you have to point out certain keywords and a speaker who is gesticulating in front of her audience, will only confuse them. So they suggest that you should stand still and draw the attention to the word or line you want to point out. A bonus is that you can do this everywhere among the audience. Others say that exactly these movements are necessary to keep the audience awake and that they are much smoother than a bright light that magnifies the shaking of your hand if you are nervous. Even if you are not, it still jiggles unpleasantly (Duke). In this case you have

Every presenter has his own preferences

the constraint that your moving range is much smaller, because you have to stay near the projection all the time. The amount of advice you get is pretty large, so in the coming paragraphs I will only point out the arguments that I found important and that helped me improve Fly Remote.

3.1   A good talk

The appearance of the presenter is very important

The main goal of giving a presentation is to share your knowledge of a certain topic with your audience. Clearly everybody who attends a talk firstly wants to learn something about a specific subject. However, the appearance of the presenter is almost as important because if she can not enthuse her crowd, no one will listen to her and her main goal will not be reached. So what are the factors that turn a normal or even poor presentation into a good one? We distinguish 3 sections: the preparation, the slides and the appearance. My research relies on the following Blog entries: Berkeley , Duke , Texas , Schoeberl and Toon and the paper: Alon [2009] .

3.1.1   The preparation

Even if a presentation can be set up in a few hours, you should always start as early as you can. Some bloggers advise starting already 3-4 weeks in advance, because the more often you read your work, the more improvements you will make. Nobody can create a perfect presentation in a few hours, so take your time and read it over. This leads us to a hint you keep coming across: practice. After a certain time you also know better what is coming afterwards. This will help you later on to speak more freely without peaking at your notes.

Before setting up your slides, you should catch up on the knowledge of your audience. One or two extra introductory slides can help them reach the required foreknowledge to follow your talk. Modern presentation tools will sometimes help you create bypass-slides (or bypass-tours in can-

vas presentations), which you only show when you notice that your audience is not on the same page as you.

Keep it simple stupid (K.I.S.S.) – this is an advice that you can read almost everywhere. The content of your slides should be understandable, so that everybody can follow easily. If your slides are too complicated – including difficult formulas, uncommon expressions or too much text – people will either try to understand them without listening to the speaker, or they will completely stop paying attention.

K.I.S.S. - Keep it simple stupid

Preparation not only includes creating your slides and practicing your talk, but also the provision of information about the material that is at your disposal. It would not be very clever to prepare a Powerpoint-presentation in a room that does not have a projector. Additionally, the information about the operating system your presentation will run on is important. When creating a slideshow on one operating system and importing it onto another one, some images may disappear mysteriously or some fonts will change so that they do not fit on the screen anymore. You should also try to show up earlier so that you can get familiar with the equipment provided. Another way of being on the safe side is to bring your own material, especially a personal clicker remote which you know by heart and on which you do not have to think about which button to press next.

3.1.2 The slides

First of all, the presenter should bear in mind that slides are only a complement to the talk he is giving. They should only include the main keywords and especially no complete sentences , because if they are full of text, your listeners will not know if they should focus on the words you are saying or on the words that are projected. Peyton Jones et al. [1993] believes that six or seven "things" on one slide is quite enough. As a picture can be worth a thousand words, it can be useful to fill the free space on slides with some expressive images.

No complete sentences on the slides

When you do not want to confuse your audience, you

should copy slides you need more than once. Zapping through the presentation is felt as annoying, especially when the user does not know exactly the slide number of the element she wants to show.

3.1.3   The appearance

This is probably the section where we did the most reflections on, because the quality of a talk depends a lot of the capabilities of the presenter. You can directly distinguish a presenter who feels at ease with performing in front of her audience and a presenter who sees this as a task she wants to get rid of as soon as possible. The crowd reacts on the mood of the speaker. If the latter one projects confidence , speaks loudly and varies the volume and the rhythm of his voice, the people in front of him recognize this and are willing to pay much more attention. Furthermore, a talk is greatly improved if the audience recognizes they are being talked *to* rather than being talked *at* (Peyton Jones et al. [1993]).

A speaker should present confidence

Another psychological point is the body language. A person who stands in front of the crowd with his arms crossed transmits less enthusiasm than someone with an open body language.

Besides, the talk of a stationary person seems more slow moving than a talk of an active one. Above all, face the audience. Neither hide behind your computer your presentation is running on, nor face only the projection on the wall. Eye contact is very important, it will not only show politeness of addressing everybody in the room, but the interested looks of the crowd can also energize you.

Never overrun as a speaker

A last important point is the time. Never talk longer than you are allowed to , because it shows that you are unprepared. A speaker who practiced a lot at home will not overrun, she knows how to divide her time. Planing some additional minutes for a discussion at the end of your presentation is also very important.

3.2   Interaction between people and their tablets

In a second phase I wanted to know how people hold the iPad so I could arrange the interaction areas according to their hand positions. Obviously, with its dimensions of 24x18.5 cm, it does not have the typical size of something you would like to carry around during a talk. In addition to that, its weight of about 0.65 kg (cf. table 3.1) is also not a negligible factor.

	WIFI	WIFI + 3G	WIFI + 4G
iPad 1	680 g	730 g	/
iPad 2	601 g	613 g	/
new iPad	652 g	/	662 g

Table 3.1: The weights of the different iPad generations.

But in order to make an appropriate use of the touchscreen, we held on to the iPad as interaction medium and put aside the ideas of using the smaller screen of a more handy smartphone. And exactly because of its weight, the ways how people hold the iPad and carry it around are limited. In Appendix A you can find a collection of sketches how we imagined that people would hold the iPad. But according to our own test and the tests done in the literature (Wagner et al. [2012]), only a handful of positions are being used. The five most common holds can be seen on figure 3.1.

The holding positions of an iPad are limited

Table 3.2 shows the results of a user test done by J. Wagner et al. Under a pretext, they asked their participants to hold the iPad in a way they find it comfortable and perform a few tasks as fast as possible. These tasks consisted of tapping appearing targets and scrolling a slider's thumbwheel from one end to the other.

My own test was a little bit different because I did not use a pretext to find a participant for my test. In order to get an own idea of how people interact with a tablet during a talk, I found a volunteer of the media computing group, who consented to give his lecture using the iPad. Using Apple's Keynote App on the iPad, I imported his slides and just told
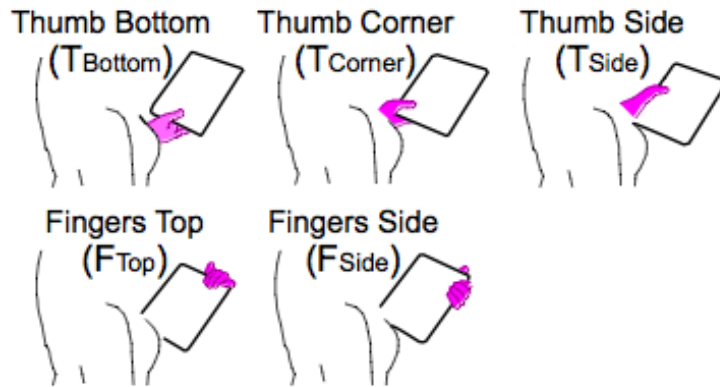
Figure 3.1: The 5 most common holds. Wagner et al. [2012]

Position	Percentage
F_{side}	41%
T_{bottom}	21%
F_{top}	16%
T_{corner}	14%
T_{side}	9%

Table 3.2: The time spent holding the iPad per position according to Wagner et al. [2012].

him to feel comfortable during his talk. Table 3.3 shows the percentage he used for the different positions, including the time he put the iPad on the speaker's desk.

As you can see, the participant preferred laying the device aside, and the reason for this is quite obvious. He admitted that he was afraid of dropping the iPad when he just used one hand to carry it, and adding the second hand was out of question because he wanted at least the second one to make gestures.

Results

Users prefer laying the iPad on a flat surface

From my own test, I found out, that because of his unhandiness, it seems that users prefer laying their iPad down on a

Position	Percentage
F_{side}	5%
T_{bottom}	4%
F_{top}	6%
Speaker's desk	85%

Table 3.3: The time spent holding the iPad per position according to our own test.

flat surface and use both of their hands to gesticulate while talking. However, as a presenter you do not always have a speaker's desk, so when you really have to carry the iPad around, the user studies from Wagner et al. [2012] helped me find the hotspots of the iPad.

PO & LO:
In the future, I will use PO and LO as abbreviations for "portrait orientation" and "landscape orientation". PO is when the long edges of the screen are on the side, and LO is when these edges are on top and on the bottom.

Definition:
PO & LO

Figure 3.2 reveals that the best positions for one hand navigation are in the upper corners. When carrying the iPad on the left side, the hotspots are in the right upper corner and vice versa. This reinforced my idea of placing the most commonly used buttons in these regions, as it is described in section 5.2.2. This has the advantage that you do not necessarily need to use your second hand as an aid to control your presentation, so you can use it for your gesticulation.

3.3 Some extraordinary clicker remotes

A small research of a few clicker remote controllers, that do not only possess the ordinary functionalities, were very helpful to find features you would not directly think of. A collection of 21 clicker remotes can be found in Appendix B.

The two main points that I found useful for my project, were the intern memory and the own timer. I was inspired
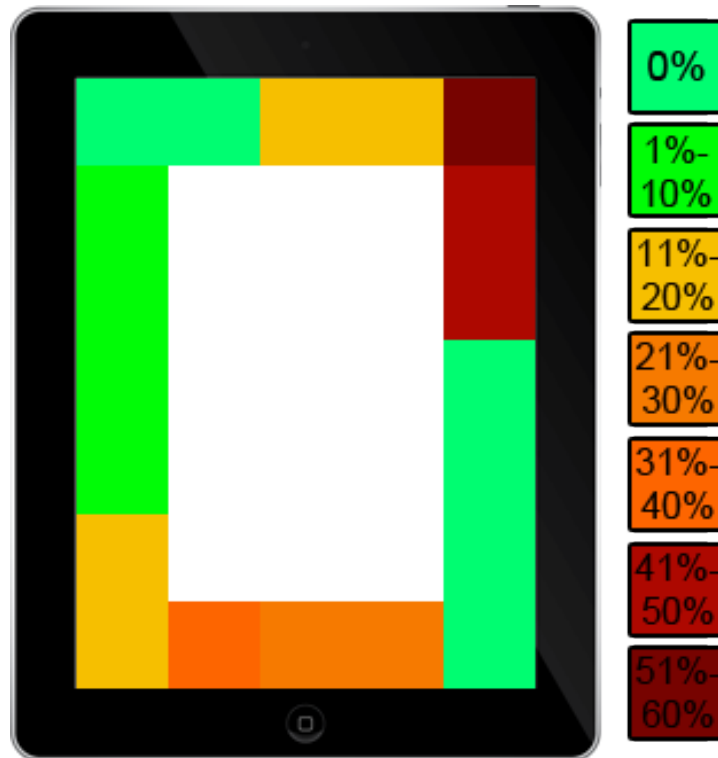
Figure 3.2: The hotspots of the iPad in PO, when you carry it around with your left hand according to the user studies of Wagner et al. [2012]

by the fact that you can load your presentations on the remote controller itself and do not have to worry about any other device, like your laptop or another flash drive, that you have to think of when you go to the place where you give your talk. So with Fly Remote, you should also be able to give your presentation wherever you are. In my case, I am using the document directories (the local and *ubiquitous* one) of the application to save the presentation.

Definition:
ubiquitous directory

UBIQUITOUS DIRECTORY:
Making a user's documents ubiquitous using iCloud means that a user can view or edit those documents from any device without having to sync or transfer files explicitly. Storing documents in a user's iCloud account also provides a layer of security for that user (Apple [b]).

An own timer can also be useful while giving your talk. On big conferences you often have a single screen that only displays the remaining time, and in any other rooms you usually can find a clock. So as you can never rely on such equipment, an integrated timer can be very helpful. One of the analyzed clicker remotes, the wireless USB Laserpointer by Photon, is even vibrating when there is only a certain amount of time left for your talk. Unfortunately the iPad does not support vibration so I chose to rely on visual feedback only. For the last 3 minutes, the timer changes from white to red so that the presenter is aware that she has to come to an end.

Fly Remote will have an own timer

Beside taking a look at different clicker remotes, I also analyzed other existing remote controllers running on a tablet or smartphone. The next chapter will cover a few of them.

Chapter 4

Related work

Fly Remote is not the first remote software that has been developed for a touchscreen. Other people have already created a few other applications, always designed for their own needs. In this chapter I want to cast a glance at these different applications, where I first have to distinguish between software for the iPhone and software for the iPad. Obviously, the iPhone has a much smaller screen and can not display the same information as its bigger brother.

There exist already some remote applications for touchscreen devices

In order to improve my software, I wanted to analyze a few existing applications which also use the device as a remote controller. I did not only take a look at the implemented features, but I mainly concentrated on examining the user interfaces. Therefore, I pointed out the parts that are a little bit disturbing so that I will not do the same mistakes, but I also gave credits to good ideas that I could transfer to my project in a similar way.

4.1   iPhone remotes

Even if all the tested applications are no stand-alone programs, and Fly Remote should not control a presentation running on another device, I still took a look at the design aspects of them.

4.1.1   iClickr Remote (Senstic)

iClickr Remote
has a clear struc-
ture

The controlling screen of iClickr Remote is kept very sim-
ple. You can see your current slide, you have two buttons
which are labeled with a right arrow and a left arrow, a
third one which displays your notes and a last one in the
right upper corner which opens a popover with more op-
tions when pressing it. Just over the slide preview, a small
label announces the name of the presentation and the num-
ber of the current slide. At the lower right corner you can
either display the current time, or use the space for a timer.

Figure 4.1: The iClickr Remote application for the iPhone

Irritating things:

- You can only choose between the slides or the notes,
  but you can not display them simultaneously. I'm
  sure that the size of the iPhone plays a big role here,
  but in our future project we want to display both at
  the same time.

- The time that is running on the right lower part of the screen is counting up and not down, which is a bit strange because normally, it is more important to know the remaining time than the elapsed time.

Useful things:

- The fact, that you can specify the time of your talk and get notified when it is finished, is a real bonus. You will not overrun your specified time, which is one of the biggest flaws you can do. (Alon [2009],Duke)

- You can switch between PO and LO and chose the one you prefer. The LO focusses more on the slide itself, you have it almost fullscreen so you can see more details than in PO, where beside the slide, several buttons and the clock fill the screen.

- You can open a timeline which displays all the slides and lets you pick the one you want to jump to.

TIMELINE:
A definition of a timeline I found on the web, was "a representation or exhibit of key events within a particular historical period" (TFD). In this context, the timeline represents a list of all the slides in a slide presentation or a list of stops in a canvas presentation arranged in chronological order.

Definition:
Timeline

4.1.2   MyPoint (Didonai)

MyPoint also comes with a clear interface. Half of the screen is filled with the current slide, the other half consists of the next 3 slides and a Tab bar with 4 buttons: the next- and previous-slide button, a timeline button and a settings button. When tapping in the area with the upcoming slides, the presentation tool will directly jump to the next slide.

MyPoint also displays upcoming slides

Figure 4.2: The MyPoint Remote application for the iPhone

Irritating things:

- Landscape mode is disabled, so the current slide you are talking about will always only have the size of half an iPhone screen, which is quite small.

- You have 3 small previews, but unfortunately it does not matter which one you press, you will always proceed to the first one of the 3.

Useful things:

- Similar to the iClickr app, MyPoint also comes along with a timeline where you can choose the slide you would like to jump to.

- The area the user has to tap, when she wants to jump to the next slide, is pretty big, so with some instinctive feeling he can skip the slide without turning her back on the audience.

- When tapping in the area where the upcoming slides are shown, you can directly forward to the next slide. You do not necessarily need to take a look at the screen to proceed. This is an advantage, which Pascoe et al. [2000] classify in the category of *Minimal Attention User Interfaces*.

4.1.3   2Screens (Edwin Lam)

The iPhone application 2Screens is a remote application for the iPhone which lets you control presentations running on an iPad. On the left side, you have a small preview of the current slide. Besides that, you have 9 different buttons. One to open the the preferences, one to disconnect, one to make the projector screen black, one to jump to the first slide, one to enable the on-screen arrow to point something out, one to start the presentation as a slideshow, one to toggle among tabs and finally three to go to a specific page, to go to a bookmark and to display a timer. Furthermore, on the bottom your notes will be displayed.

2Screens focusses more on the buttons than on the current slide

Irritating things:

- You can go to a specific slide, but unfortunately you have to know the exact slide number.

- The preview of the current slide is even smaller than the one of the MyPoint-App so it's hard to perceive small details.

- I also missed a preview for the upcoming slide, so if the presenter does not know the order of his slides by heart, he can not make a smooth transition between the slides.

Useful things:

- The presentation can be controlled by swiping from the left to the right and the right to the left, but also

Figure 4.3: The 2Screens Remote application for the iPhone

by tapping once to access the next slide and tapping twice to access the previous slide. Double tapping can not be used in my project as I need it for the "third dimension" when the user wants to zoom in or out.

- A timer which can be hidden is also very useful during presentations, and this one can even be paused and reset on the go.

4.2 iPad remotes

As Fly Remote was planned to run on the iPad, I did not get around taking a look at other presentation software creations for this device. In contrast to the iPhone, the iPad has a much bigger screen, which results in a better preview of the presentation and a better user-software-interaction. Buttons that had to be placed on other views on the iPhone

can now be made directly accessible. The presentation tools
for the iPad can all run on their own and presentations can
easily be imported on the device. The applications I ana-
lyzed are 2Screens for the iPad, SlideShark, Prezi Viewer
and Apple's Keynote Remote.

Buttons can be
made directly
accessible

4.2.1 2Screens

The 2Screens application for the iPad can import its pre-
sentations via iTunes or download them directly from any
web source. They are stored locally and are accessible all
the time. The slides are almost displayed fullscreen, just
a thin tab bar at the bottom reveals some buttons. Beside
the usual ones which allow a jump to the next or the previ-
ous slide, you also have the possibility to display an arrow
on the screen which should replace the functionality of a
laser pointer, you can allow annotations on the go, display
thumbnails of all the slides or even start your presentation
as a slideshow with a specific time interval.

Presentations are
stored locally

Figure 4.4: The 2Screens application for the iPad where the
timeline has been opened. The red arrow on the right rep-
resents the surrogate laser pointer.

Irritating things:

Actually, I did not find any flaws that I should take care of in my project.

Useful things:

- With the possibility to tap anywhere for accessing the next slide, the user does not have to glance at his device to make use of the most common functionality.

- A transparent text-box containing notes can be popped up, which is a good mixture if you want to add some additional stuff on your screen without shrinking the preview of your slides.

- Making own annotations on the slides can also be seen as a useful feature to provide additional information on the go or to point out a few important keywords.

- The timeline is just a popover, so you can still see a big part of your slide while searching for a specific one.

4.2.2   SlideShark

SlideShark has to be connected to an online account in order to access the uploaded presentations. Once downloaded, you do not need an internet connection while you do your talk. During the talk your presentation is fullscreen, and you can navigate through it by tapping or swapping horizontally. Swapping from the bottom to the top reveals the timeline and a few other buttons (Figure 4.5). Before your talk, you can unlink slides if you think they are unnecessary for your specific presentation, they will simply be skipped.

The navigation is done by tapping and swapping
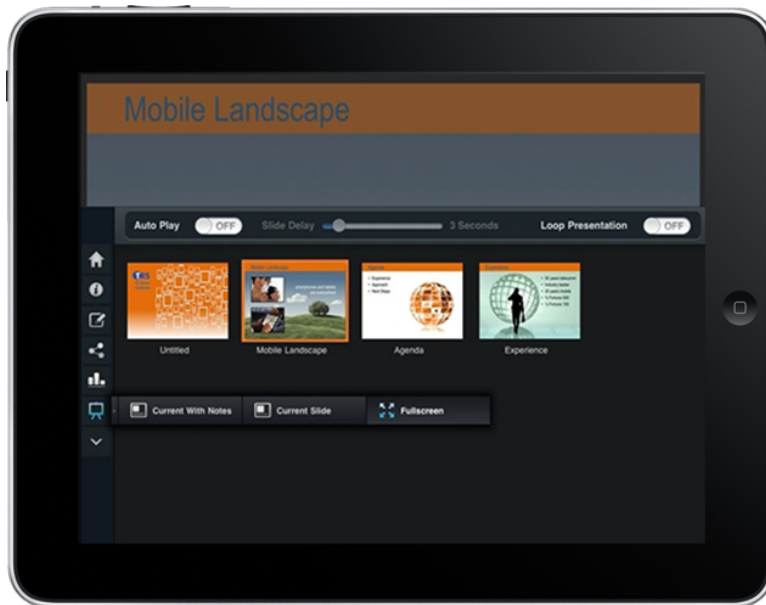
Figure 4.5: The SlideShark application where the timeline, including some preferences buttons, have been popped up.

Irritating things:

- According to Don NormanNorman [2002], visibility is one of the most important aspects of design. Interfaces must have visible features, inferring the right messages to us. However SlideShark is only displaying one big slide without any hint how to interact with it.

Useful things:

- Again, a folding timeline can help the user a lot during her talk.

- Because of the fact that you can skip slides in advance, you can adopt your presentation to your audience.

- Presentations can be shared ad-hoc with other presenters or even with your audience.

4.2.3   Prezi Viewer

Prezi Viewer is the only application so far that is based on a zooming user interface (ZUI). If you want to make use of it, you need a prezi account first. Then you can create your slides in a browser and save them on their servers. On the iPad you can now download it to your own library and use it all the time. Prezi Viewer has two modes, the "normal mode" and the "presenting mode". In the first one you can see a left and a right arrow to navigate through your presentation and an upper toolbar with a few buttons. By holding on different items, you can edit them right away. A blue button annotated with "Show" allows you to start the "presentation mode", where everything disappears except the area of your presentation. Now by tapping in the left third of the screen you can move back one position in your presentation path and by tapping in the middle or the right third you can go to the next position.

Prezi Viewer has two different modes

Figure 4.6: A sample presentation on the Prezi Viewer application currently in the "normal mode".

Irritating things:

- One mistake is similar to the one from SlideShark. In the presentation mode you have no clue how to control your presentation, you will only be informed shortly when starting your presentation. Keeping the two navigation arrows visible would not occupy much space, but would at least make the features recognizable (Norman [2002]).

- By using Prezi Viewer, I realized that a right and a left arrow are not the best choices for a ZUI. In these kind of presentations, you do not have a specific direction in which you are moving, so sometimes the next position is on the left, sometimes on the right of the current one. When you know that the next position is on the left now, you still have to press the right button.

Useful things:

- The screen is not overloaded with a lot of buttons and other features. It is kept really simple and easy to use.

4.2.4   Keynote

Apple's Keynote is not only a software that is being developed for normal Mac Computers, but since 2010 it is also available for the iPad, and in 2011 even an iPhone version was released. Apple likes to call it "the most powerful presentation app ever designed for a mobile device."[1] On the main screen you can open existing presentations, which have been created on the iPad itself, imported via iTunes or synchronized via iCloud, or you can start composing a new one. The editing screen is then divided into three parts. On the left side you have a vertical timeline with all your slides, an upper toolbar contains all the editing tools, and most of the screen is covered by the working space.

Import via iTunes or synchronization via iCloud

---

[1]http://itunes.apple.com/us/app/keynote/id361285480

During the presentation you can either choose to display
only the current slide, the current slide with notes or the
current and the following slide. This can also be changed
during the presentation itself.

Figure 4.7: The editing screen of the Keynote application
for the iPad.

Irritating things:

"The swiping gesture with which you go to the next slide
can be very annoying when the device does not recognize
it", was mentioned as only negative thing during my test.
Tapping to access the next slide worked much better.

Useful things:

Keynote comes along with a lot of features for the editing
screen, but the presenting screen is kept pretty simple. The
only thing that is new and also useful for my project, is that
you can synchronize your presentations through iCloud
and access them on all your devices.
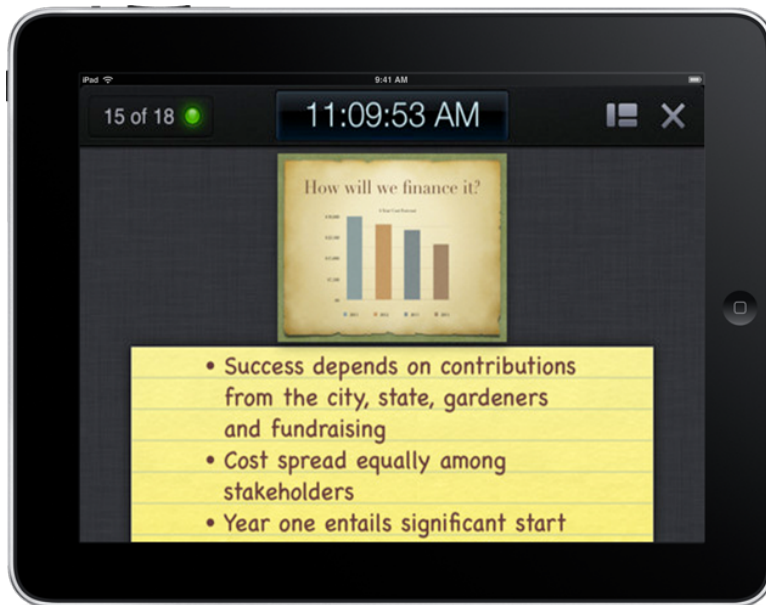
Figure 4.8: The presentation screen of the Keynote application for the iPad, where the user chose to display the current slide including her notes.

After the analysis of some existing software, we can now focus on my own work, where I tried to take care of the interesting things, like for example the timeline or the timer, but where I also tried to avoid flaws that I found in the examined software, like not using the swipe gesture and always displaying the buttons you can use.

Chapter 5

First iteration

Fly Remote has been developed iteratively based on the Design-Implement-Analyze-Cycle (DIA-Cycle) approach (see figure 5.1). This is a human-centred design, where first of all, you have to collect some ideas, then you can start implementing your first prototype and finally you give it to your customers or any kind of user. Based on the feedback you get from them, you update your design and re-run through the cycle. After each iteration, the design will be more and more refined until you reach the point where nothing is rejected anymore.

The Fly Remote development is based on the DIA-Cycle approach

In my case, I collected my first design ideas in the previous chapter, by examining similar programs.

In my first design reflections, Fly Remote should compose two main views, a starting view and an actual presentation view. The starting view should look like a menu, where you can choose your presentation from a list which contains all the presentations created so far. Furthermore, you should be able to adjust some preferences that can be different each time you give your talk. When everything has been set up, you will be forwarded to the presentation view. This one should be composed of an area which contains the actual presentation, and an area which contains all the needed buttons to control this latter one.

Figure 5.1: The human-centred DIA-Cycle.

I still have to note, that Fly itself was created in three iteration steps, and that my first prototype was based on the second one of these three. In my second iteration, Fly Remote will be grounded on the most recent version of Fly, but first of all let us take a look at the first prototype.

5.1 The starting view

The starting view has a Master-Detail setup

For my starting view, I chose a Master-Detail setup. Figure 5.2 reveals these two parts. Even if the left part shows three different divisions, namely a "New-", an "Edit-" and a "Present-division", I was only focussing on the presenting; the others are currently just placeholders for parts that will be done in the future. For storing the presentations, I chose the ubiquitous folder in the application, which is synchronized with all other own devices running Fly Remote,

but also all own Mac computers running Fly. This is probably better known under the keyword "iCloud". So when changes are saved on a computer, they will be updated on the devices too. The date and time under the name of the presentation reveals when the last changes have been recognized by Fly Remote. A footer note informs if the iCloud service is available after all.
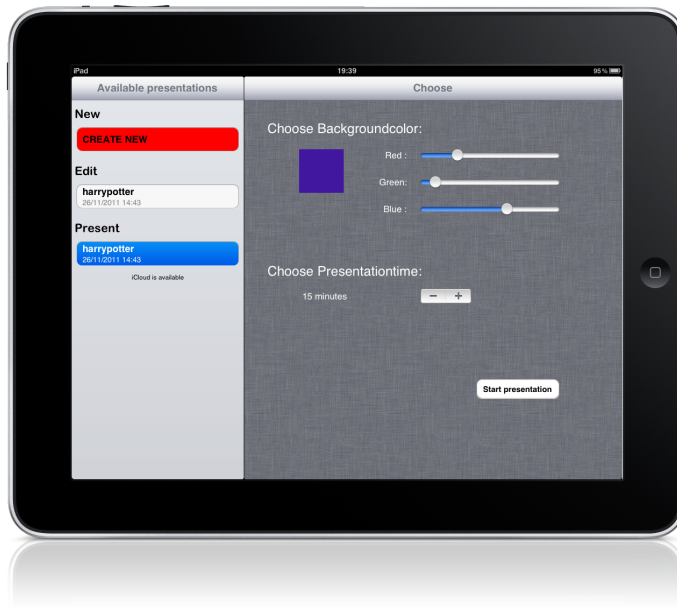
Figure 5.2: The starting view of the first prototype of Fly Remote. On the left you can select your presentation, on the right you can set your preferences.

The preferences you can choose are very limited, as you can see on the right side of figure 5.2. On top, you can single out your desired background color, which is shown in a small, square preview beside the sliders, that you use to modify it. Beneath, you can set the timer, and this is it. By pressing the "Start Presentation" button, you will move on to the presentation view, so you can start giving your talk.

Two kind of preferences can be justified

Figure 5.3: The Fly Remote presentation view, composes: 1) The presentation area, 2) The buttons area. (The colors of the buttons do not have any meaning, I just wanted to make them easily distinguishable.)

5.2   The presentation view

The buttonns are separated from the presentation area

The presentation view is actually composed of two different areas. As you can see on figure 5.3, the upper area, which fills about a fifth of the screen, contains all the buttons you need during your talk. Beneath, you can find the actual presentation area.

The size of these areas was not chosen arbitrarily. In Fly, when specifying the different stops in the path of your presentation, you navigate to your desired position and push the "snapshot button", which means that the stops will have the aspect ratio of your computer screen. Unfortunately, the Macbook Pro comes along with a 16:10 aspect ratio whereas the iMac has a 16:9 aspect ratio. I decided in favour of the 16:10 ratio, because the portable macs have been 2.5 times more coveted than the desktop ones in 2011

(cf. Apple [a]), thus the probability that the user is working on a portable Mac is higher than that he is working on a desktop Macintosh.

The remaining area of the iPad screen was big enough to add all the buttons the presenter will need for her talk. Referring to the hotspots of the iPad that I located on figure 3.2, I chose to put the buttons bar over the presentation area and not vice-versa.

5.2.1 The presentation area

The background color of the presentation area was set on the color you chose on the starting view. For the rest, I tried to take over the style of Fly as good as possible, as you can see on figure 5.4.

The mental model of this area implies that you can use it to navigate freely through your canvas presentation, and this is exactly how it works. Beside the swipe gesture, allowing to scroll in any direction you want, you can also pinch to make use of the third dimension which is typical for these kind of ZUI presentations.

If you tap twice on a position, it will zoom in with a scale of 2, making the tapped coordinate the new centre of the presentation surface. A better solution, where for example double tapping on a position will result in jumping to the position the tap was recognized, was quite hard to find, because a lot of positions overlap with each other and then you don't exactly know which one to zoom to. Moving to the position where the tap was closest to its centre, is also not possible because the positions are not visible as rectangles, so the user can only guess where to tap.

Zooming can be done by double tapping

A feature I did some more reflections on, was the representation of the presentation path, which is represented as a yellow line on the iMac on figure 5.4. The first time I implemented this path, I found it too overcrowded for this little screen. This is why I hid them and only made them visible when the user pushes on the screen for more than one second. Then two lines would pop up, a red one and a green

Representing the whole path was too overcrowded

Figure 5.4: Displaying the same example presentation on the iMac, the iPad and a canvas. Fly (2nd iteration) is running on the iMac, Fly Remote (1st iteration) is running on the iPad and the projection is done with Fly Remote too.

Figure 5.5: The representation of the path, where the end of the green line corresponds to the centre of the next position, and the end of the red line corresponds to the centre of the last position.

one, representing the path to the centre of the last respectively the next position (Figure 5.5).

5.2.2   The buttons area

As figure 5.6 reveals, the first implementation of the buttons area was very colorful. This had no special meaning, I just wanted to make them easily distinguishable. There are 7 different things you can recognize at first glance:

1. 2 "Next"-buttons

2. 2 "Back"-buttons

3. a "Current position"-button

4. an "Exit"-button
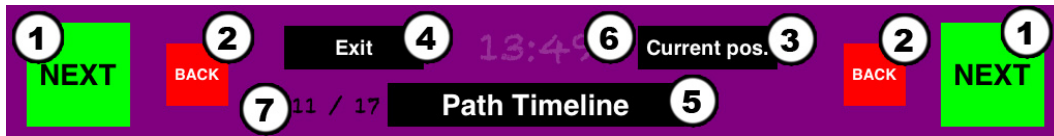
Figure 5.6: The buttons area of the first iteration. The different buttons are explained in section 5.2.2.

      5. a "Path timeline"-button

      6. a timer

      7. an index

The "Next"-buttons

Next-buttons are placed on both sides

The meaning of these 2 buttons is clear, and it is also clear that they are the ones that will be used the most. This is why I chose to put them in the region where they can be accessed easily (Figure 3.2). And because of the fact that you can not know if the user will hold the iPad with the left or the right hand, I put them on both sides.

To avoid perturbation, I also annotated them with "Next", and did not choose to use an arrow which points to the right. For example if the user knows that the next stop of his presentation is on the left of the current slide, she could be confused by pressing a button which points in the opposite direction.

The "Back"-buttons

Back-buttons are placed on both sides

My argument for the placement of these buttons is almost the same as for the "Next"-buttons. These will probably be buttons that will also be pressed pretty often, so I placed them just beside the "Next"-buttons. In order to make them directly distinguishable I chose to give them another color, and making them also a bit smaller.

The "Current position"-button

A button whose function is maybe harder to understand by simply referring on its label, is the "Current position"-button. In fact, it brings you back to the current stop you maybe left to give further explanations in other regions of your presentation. I could not find any symbol which could explain this functionality, that is why I held on to this textual label.

The "Exit"-button

It is clear what the "Exit"-button does. By pushing it, you will simply leave your presentation and go back to the starting view.

The "Path timeline"-button

This button will open a popover which displays a list of all the stops in the presentation (figure 5.7). If the presentation has more than one path, different paths will also be divided into different sections. The identifier for each stop is a name you could specify when creating your tour through the presentation on the computer. In this list, the row which contains the current stop will be highlighted, which helps with your orientation.

A timer

A timer reveals the time the user has left for his talk. As it is more important to know your remaining time than your elapsed time, I decided on a timer and not on a stopwatch. As I did not want the user to be distracted too much by the ticking seconds, I used a color which does not stand too much in contrast associated with the background. However, for the last three minutes, the color will become red, so the user will be informed that his time is running out.

A timer is more expressive than a stopwatch

Figure 5.7: The first prototype of Fly Remote with the opened timeline.

An index

This label reveals two information: the index of the current stop and the number of all stops on the current path. In addition with the timer, the presenter can now assess the time she should spend on her remaining stops.

5.2.3   Evaluation

After the implementation of the first prototype, I wanted to get a few first impressions by some users.

First I gave it to the creators of Fly, Leonhard and Thorsten, to see their opinion about it and to get a few ideas of functionalities I might have missed.

After that, I presented the prototype to a few other academics at the RWTH media computing group, in order to enlarge my range of ideas even more.

Finally, I wanted to see how other people grasp all the features. So I handed my prototype to a few colleagues and told them to play around with the software, while I did a so-called *silent observation*.

More feedback by silent observation

> **SILENT OBSERVATION:**
> Silent observation is a pure observation with little or no interaction with participants. It is based on the ethnographic research approach, which assumes that researchers must first discover what people actually do and the reasons they give for doing it before trying to interpret their actions through filters from their own personal experience or theories derived from professional or academic disciplines. (LeCompte and Schensul [2010])

Definition:
silent observation

I will present the results of the observation, followed by the changes of my prototype in the upcoming chapter.

Chapter 6

Second iteration

In this phase of my implementation, I wanted to eliminate all flaws recognized by the volunteers so far. Almost everybody told me that they could not imagine giving a talk with my software because they were missing an area displaying some personal notes. If the presenter does not want a jampacked presentation on one hand and does not want to forget some points on the other hand, she must be supported accordingly.

However, this would include new problems. A "note area" would again result in a shrinkage of the presentation area, but this is something I absolutely tried to avoid, because I wanted to keep the presenting area as big as possible.

My first solution was to transform the buttons area into an area where you could choose between the buttons and notes. I added two tabs to switch between these two layers (see figure 6.1), but soon I recognized that this was no great shakes as the user would surely be annoyed switching all the time from the notes to the buttons and backwards.

A second solution was to minimize the buttons and use the gained space for the notes. In order to not make the buttons to small so you could still hit them problem-free, the notes could only include three rows of text at a readable size. So instead of using a fixed notes area, I used an extendable one. Now the user can decide herself how many

Presenters were missing notes

A note area would probably shrink the presentation area

Making the notes area extendable
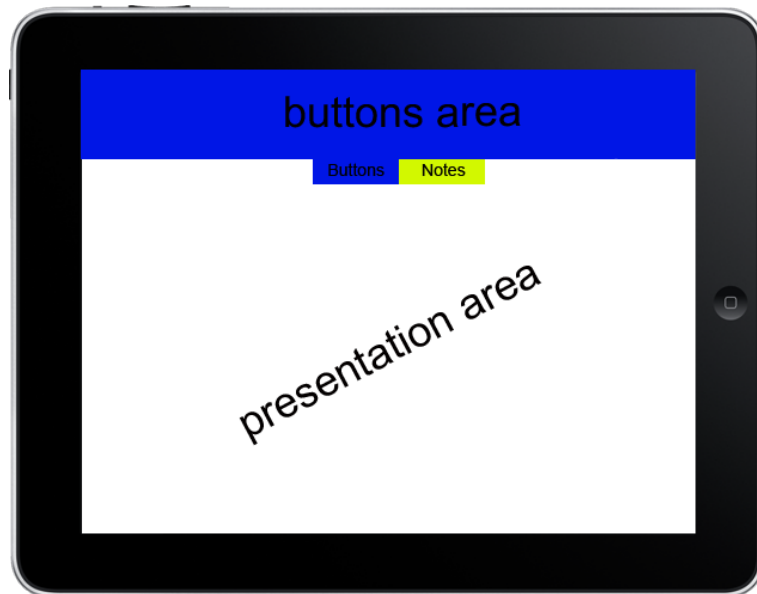
Figure 6.1: Sketch of the presentation view, where you can switch between the buttons and the notes using the tabs.

lines of text she wants to see. Unfortunately, the new created area overlaps the presenting area. Therefore I made it semi-transparent so the user can still see the contents behind the notes.

The PO is more notes-based

Still not completely happy with my solution, I came across a completely new approach. The idea was to also use the PO as a more notes-based view. Here I shrank the presentation-view to half of its size, so I could use the gained space for the notes.

All in all, the presenter shall have the option between the landscape orientation which focusses more on the presentation view itself, and the portrait orientation where the notes are more prominent.

Beside the notes, there are no new functionalities that have been added, just a few major and minor changes of the existing views. In the previous chapter I already mentioned that for the different iterations, I based on different versions of Fly. So in my current iteration, I took the most recent version of Fly as a reference.

6.1   The starting view

For the starting view I sticked with the Master-Detail setup,
where the appearance of the left part remained the same.
Because of the fact that Fly only supports white as back-
ground color for the presenting area, I decided to remove
the sliders which allowed the user to pick his own back-
ground color. Furthermore, the newer version of Fly sup-
ports the grouping of certain images and texts into the same
topics. These topics are deposited with different colors on
the presenting area. By choosing your own background
color, they would not stick out the same way as they would
do on a white background.

Concerning the timer, I changed the way to set it. The prob-
lem with the stepper was, that if I chose the stepping in-
terval too small, it could take several time to reach your
desired number of minutes. If I chose the interval too big,
more detailed presentation durations could not be defined.
This is why I changed the digital scale into an analog one,   Analog scale for
namely a slider. Now you can quickly set the slider to the   the timer
desired time, and for the more detailed changes, I still put a
button at each side where you can increase or decrease the
slider by an interval of one.

As shown on figure 6.2, I also added two new categories.
The "pathsettings" allow you to change the appearance of   4 different path
the path through your presentation. You can choose be-   settings
tween *None*, where no path at all is displayed, *Next pos.*,
where a green line shows the direction of the next camera
move, *Last & Next pos.*, where a red line shows the direction
of the last and a green line the direction of the next camera
move, or *Full path*, where the whole path through the pre-
sentation is shown.
The "topicssettings" rely on a new feature of Fly. The most
recent version of the desktop software allows you to ar-
range components of your presentation in different top-
ics. These topics are represented by colored rectangles in
the presentation area, including all their components. Each
topic can also be labeled with an own heading. In the top-
icssettings you can now enable these rectangles with their
headings or disable them.
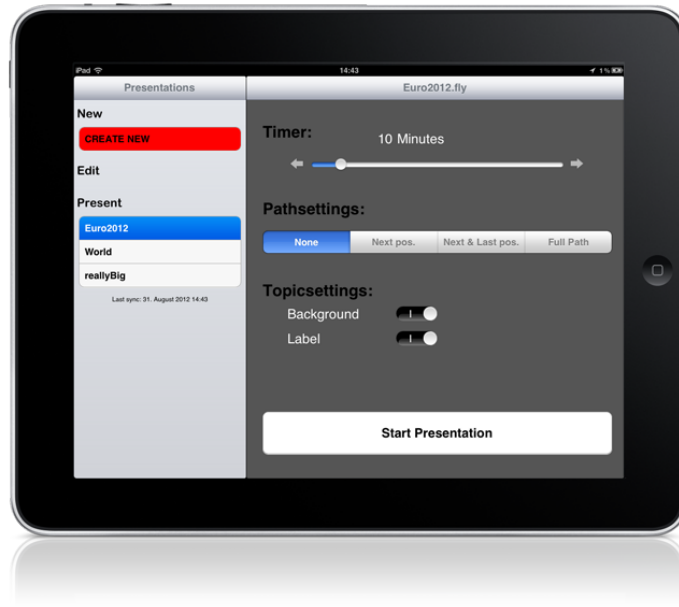
Figure 6.2: The starting view of Fly Remote with the preferences for the timer, the path and the topics.

6.2   The presentation view

The biggest difference between the old and the new presentation view is that it now allows the user to choose either the more presentation-centered LO or the more notes-centered PO. In both cases the screen consists of 5 areas:

1. The presentation area

2. The buttons area

3. The timer area

4. The notes area

5. The timeline area

Figure 6.3 reveals the arrangement of these different areas. In the landscape orientation, the notes are represented as

a gradient layer, what should reveal its resizable property. The reason for the dashed lines of the timeline area in the landscape orientation is, that this area can be pulled out or be hidden. More details about these areas will be presented on the following pages.
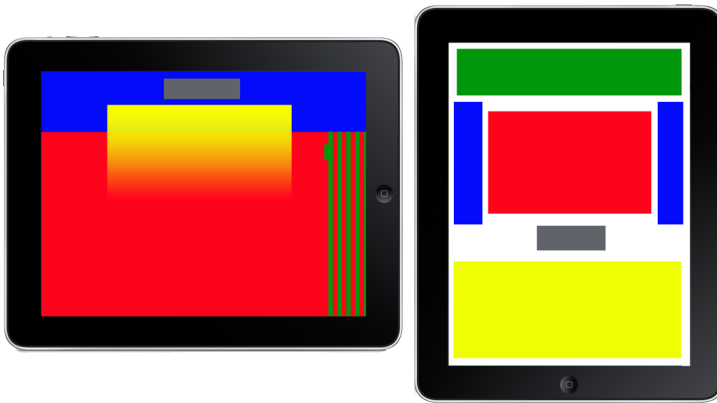
Figure 6.3: The arrangement of the 5 main areas in the landscape and in the portrait orientation. Red: Presentation area / Blue: Buttons area / Grey: Timer area / Yellow: Notes area / Green: Timeline area.

The advantages of placing the buttons in LO over the presentation area has already been discussed in the chapter before.

The notes area is semi-transparent, so if you overlap the presentation area by enlarging this area, you can still see most of the things you are talking about. The timeline area is semi-transparent too, so you can open it without renouncing on the right part of your presentation. When hidden behind the right edge, just a small handle reveals that it can be pulled out.

The notes area is semi-transparent

In PO, I chose to make everything visible and consequently directly reachable. As the presentation area is the most important area, I decided to put it almost central. The buttons are on the right and on the left of this area. I assigned the biggest remaining space that was left, which is the bottom third, to the notes and placed the timeline on top where it fitted best.

6.2.1   The presentation area

The choice be-
tween 3 different
aspect ratios

The problem about the different aspect ratios of your pre-
sentation, when creating it on the iMac or on the Macbook
Pro, was solved in the newer version of Fly. While creating
your stops, you can set the aspect ration to either 16:9, 16:10
or 4:3. These information are saved in the Fly document,
which means that the presentation area can be adapted to
its ratio.

The appearance of the area also has changed a bit. The text-
contents are now written in black on a white background,
and contents that belong together and form a topic have
their own heading and own colored background color (if
they have not been disabled in the starting view). The
length of the presentation path is also defined during the
setup on the starting view, so you don't have to worry
about how to make it appear respectively disappear. Fig-
ure 6.4 reveals the new look of the presentation area in LO,
while figure 6.5 reveals it in PO.

Figure 6.4: Overview of the presentation area in LO.

Figure 6.5: Overview of the presentation area in PO.

6.2.2 The buttons area

The buttons area also knows a few changes. I removed the "path Timeline"-button and added 2 new ones, with the result that the following ones are now accessible:

1. 2 "Next"-buttons

2. 2 "Back"-buttons

3. a "Current position"-button

4. an "Exit"-button
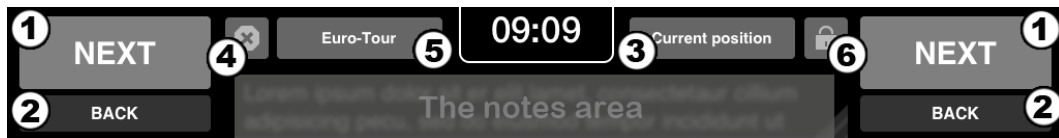
Figure 6.6: The buttons area of the second iteration. The different buttons are explained in section 6.2.2.

     5. a "Path"-button

     6. a "Lock"-button

The "Next"- and "Back"-buttons

Next-button over
Back-button

I sticked with my theory that it is better to place these two buttons on each side, but I was not happy with their mapping. On the right side, the "Next"-button is on the right side of the "Back"-button, but on the other side the "Next"-button is on the left side of the "Back"-button. Therefore, I placed the two buttons one on top of the other.

The "Current position"-button

The "Current position"-button has the same functionality as in the first iteration.

The "Exit"-button

The functionality of this button did not change either. I just replaced the text with an image to gain some space.

The "Path"-button

With this button you switch between the different paths you created with Fly. When clicking on it, a popover opens and displays a list with all possible paths (Figure 6.7). In

LO, it always has the caption of the current path, however, in PO, its width is too small to contain a whole name, so I decided to use the following label: "n/m", where n is the number of the current path and m is the sum of all the paths.

Figure 6.7: The "Path"-button, which has been pressed to display all the available paths. In this case, there is only the "Euro-Tour" path available.

The "Lock"-button

This button locks the screen on the projector. Its use is best when the user wants to scroll to a certain point in her presentation but does not know the exact position. When locking the screen that the audience can see, nobody will catch her helpless search. When unlocking the screen again, the projected screen will synchronize again with a smooth transition.

While the screen is locked, a fat orange border around the button area and the presentation area makes the user aware that the audience does not see the same thing as she does. This can be seen on figure 6.10, where the orange border is also used when changing the position in the timeline.

The lock is recognizable by a fat orange border around the presentation area

6.2.3 The timer area

The timer has two modes

As a few people found it a bit irritating to see every single second ticking on the timer (Figure 6.8 (2)), I decided to allow them to transform their timer, which displays every second, into a timer, which only focusses on the minutes (Figure 6.8 (1)), by simply tapping on it. During the last 3 minutes the font color of the timer becomes red and automatically uses the format which displays every single second, because at the end of the user's talk, 59 seconds can make a difference that is not to neglect.

Figure 6.8: The timer area of the second iteration, where (1) only displays the minutes and (2) displays every second.

6.2.4 The notes area

The most important things about the notes have already been mentioned. In PO, its size and position is fixed whereas in LO, it is semi-transparent and its size can be increased or decreased. To do so, you have to hold the right bottom corner and move your finger upwards or downwards until you reach the desired height (Figure 6.9).

6.2.5 The timeline area

This area has been edited to allow the user to jump faster from one stop in the presentation to another one. Because of the fact that I wanted to give her the choice to pop it out or hide it behind one edge, the only available spots were the side edges or the bottom one. To open the timeline from the bottom is pretty difficult, because the users fingers are

Figure 6.9: The presentation view, where the notes area is once contracted and once stretched.

normally in the upper region of the screen to be near the buttons. The decision why I finally chose the right side is because most people are right-handed and so the probability is bigger that they are holding the iPad at least with their right hand.

To make the user aware of this hidden feature, I placed a small handle at the edge of the screen, showing an arrow-like pattern, that should lead to pull it out. The handle can be seen on figure 6.4 on the right border.

The appearance of the timeline itself is very straightforward. The area has the form of an oblong rectangle, which contains as many small rectangles as there are stops on the current path. These smaller rectangles are placed beside each other and their size is proportional to the area they cover on the presentation. They can be shifted until the desired stop is in the middle of the area. This spot is marked with a big square. The user can also tap directly on a small rectangle, which is then automatically shifted onto the middle square.

Stops are represented by rectangles

Unfortunately in the newer version of Fly, each stop only has a numerical ID and no more label, so that the small rectangles are only labeled with a number, what makes it

Figure 6.10: The timeline in LO and in PO. The orange border reveals that the new position has not been selected yet, so the audience still sees the old position.

harder to pick the right one at the first attempt. The size of the rectangles should be a helping function, but as you can imagine, it is still a lottery most of the time.

When looking for a stop, the screen will be locked automatically

To avoid that the audience is disturbed while the presenter is looking for the right stop, I chose to automatically lock the screen as soon as the user starts scrolling through the timeline. The locking of the screen is again made recognizable by a fat orange border around the lock button and the presentation area. Furthermore, an orange "Select"-button appears on top of the central square in the timeline (Figure 6.10). By pressing either the latter button or the lock-button, both screens will synchronize, and the "Select"-button will disappear again. The user expresses that his search was successful and that she found the position she was looking for, so that the timeline will disappear again behind the right edge.

Quite satisfied with my second iteration of the software, I wanted to do a small qualitative test with a few volunteers. The goals, the exact procedure and the results will be explained in the following chapter.

Chapter 7

Final user test

To roundup my entire project, I gathered again a few ideas from volunteers about some things that can lead to new approaches in the future. The advantage of iterative development is, that it can be repeated numerous times, and every time new improvements can be found. However, for my thesis, this should become the final part.

The goal of the upcoming test was mainly to enforce my thoughts about how people would actually use the iPad as a medium to remotely control a presentation. Because of the fact that my buttons had already a fix position on the user interface, it was hard to check if there would be better spots to place them. One option was to ask the participants if they felt restricted by the composition of the application. So at the end of my test, I did a *qualitative interview*. Details will be explained later on in the section 7.2, were I explain the procedure of my test.

More feedback by a qualitative interview

> **QUALITATIVE INTERVIEW:**
> "..., qualitative interviews are one-on-one, interactive conversations between an interviewer and an informant. The objective of qualitative interviews is to get detailed information, in the form of narratives or stories, of people's experiences, local histories, and shared knowledge to get verbal pictures of systematic behaviors." (Training and for Health / University of Washington [2008])

Definition:
qualitative interview

7.1   The participants

It is very important to have a certain knowledge about
your participants to draw meaningful conclusions (Weiss
[1995]). From my eight volunteers, all of them are male and
are aged between 20 and 30 years. Six of them were actually
computer scientist students, the other two are not active in
this area. One did not want to get recorded, but he still de-
clared himself willing to participate in the test. A few other
information about the participants can be seen in table 7.1.

Note that three of my users have also been part of the peo-
ple I questioned between my two iterations, so they have
been in contact with the first prototype which could have
helped them to grasp the functionalities more easily, even
though there was a lot that had changed.

# participants	8
# male particpants	8
# computer scientist students	6
# participants that knew Fly before	3
# participants that knew Fly Remote before	3
# participants that used Fly already	0

Table 7.1: Relevant information about the participants

7.2   The procedure

My whole user study lasted for about 15 minutes and con-
sisted of three major parts:

1. exploring the software,

2. giving a sample talk,

3. giving qualitative feedback.

Before I could start the actual tests, I did some preliminary
work, by preparing two different presentations. One about

a topic that had been a lot in the news, and one about a topic where everyone should be familiar with. The topical presentation was about the european championship of soccer that just took place in the period I did my tests, whereas the more general presentation was about big and famous metropoles of our world. Both of them did almost contain only images , so the user could decide by himself what facts he wanted to tell, concerning the images he is currently presenting. This way, the participant should feel more comfortable as he will not be afraid to miss a point, and for me it did not matter what he was talking about because I focussed on his physical behaviours and not on his talking talents.

The sample presentations did mainly consist of images

To be able to take a look at the gestures of the different candidates later on, I decided to capture everything on video from two angles. One camera was tied up around the user's chest so I could analyze the exact movements she did on the surface of the iPad. With the other one, I recorded the point of view of the audience.

> **CHEST-CAM & AUDIENCE-CAM:**
> To distinguish between the camera that is fixed on the user's chest and the camera that is used to record his silhouette, I will use the abbreviations "Chest-Cam" and "Audience-Cam" on the upcoming pages. (See figure 7.1)

Definition:
Chest-Cam &
Audience-Cam

Exploring the software

Each participant should start getting familiar with the software they will use afterwards. As I gave her one of my sample presentations (she could decide on her own which one she preferred), she should also take a look at the different stops and imagine the one or other thing she wants to point out. In general this took around five minutes.

The participants start by exploring the software

During the exploration, I just used the videos from the Chest-Cam to see what the person is tapping. I told the participant to make herself comfortable, and handed her the iPad. Without interfering, I let her explore the appli-

cation on her own, but told her that whenever she had a question, she could always ask me about some functionalities she did not understand. When she felt familiar with the software and the sample presentation, I explained again every feature to her, to make sure she did not miss anything.

Giving a sample talk

2 cameras capture 2 different point of views

In a second phase, I asked the participant to place herself before the wall, where the presentation was projected on, and imagine giving a real talk to a fictive audience which would not last longer than five minutes. This time, the whole scenario was recorded using both cameras. The Audience-Cam, held by myself, should focus on the user's appearance, while the Chest-Cam should capture in vision the interaction on the iPad. The situation is visualized on figure 7.1.

Me   **Participant**
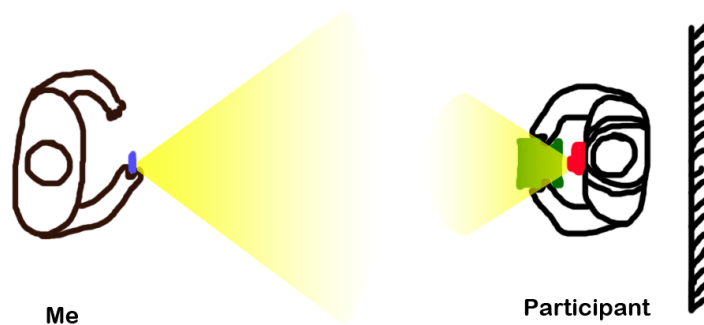
Figure 7.1: The setup while giving a sample talk — the iPad is represented in green, the Chest-Cam in red and the Audience-Cam in blue.

When the user arrived at the end of her talk, I asked her to navigate to a specific position. The goal of this was to see if people use the normal scrolling, the "Back"-button or the timeline in a spontaneous situation.

General information:	
Do you know Fly?	YES/NO
Have you used Fly already?	YES/NO
Have you come in contact with Fly Remote already?	YES/NO
Have you already used another iPhone-/iPad-presentation-tool before?	YES/NO
iPad:	
What did you like about giving your talk with an iPad?	
What did you not like about giving your talk with an iPad?	
How long do you think you could carry the iPad around?	>15 min/15-30min/ 30-45min/<45min
Would you have layed it down if you were allowed to do so?	YES/NO
Fly Remote:	
Any improvement suggestions? Any objections?	
Have there been buttons that were hard to understand? (Solutions?)	

Table 7.2: The questionnaire I handed to the participants. It is composed of 6 multiple choice questions and 4 descriptive questions.

Giving qualitative feedback

As a last task, I asked the participant to give me some feedback. Therefore, I handed her a small questionnaire with ten questions. Six of them were just multiple choice questions to get the needed knowledge about the user. The other four questions were the actual things I wanted to find out, where two concerned giving a talk while holding an iPad and the other two concerned the user interface of Fly Remote. Table 7.2 reveals all the questions of my questionnaire.

7.3   The evaluation

Direct & Indirect feedback

I got two different kind of results; the ones that have been noted in writing by the participants themselves (direct feedback) and the ones that I perceived while evaluating the tapes I recorded (indirect feedback).

7.3.1   Direct feedback

Even though, I thought most of the people would be annoyed by the size of the iPad, a lot of them mentioned that it was pretty handy. With its weight of approximately 600 grams, 5 out of the 8 candidates could imagine giving talks that last less than 30 minutes, but as soon as it becomes longer, nobody would have used it.

The participants were afraid of dropping the iPad

Also most of the participants would have laid it on the speaker's desk if they would have been allowed to do so. The main reason for this is that they were afraid of dropping the tablet. Some of them had sweaty hands, others did not find a comfortable position where they felt secure without being too tensed up.

Another problem that was mentioned the one or other time, was that they had the feeling to look the whole time on the screen of the iPad and neglect the audience. Personally, I do not know if I should place too much weight to this, because it is clear that if someone receives a presentation created by a foreigner, she automatically glances at the iPad to see what has been prepared for her. You can not simply know the whole presentation by heart when you only looked at it once.

One participant even admitted that holding an iPad during the talk would help him focus more on his presentation, because he is not distracted by his annoying thoughts where to put his hands.

The timeline can still be improved

The task showed, that there are still some capabilities of improvement for the timeline. The ones found that the handle on the right side was too small to hit on the first try, others

said that the small rectangles, representing the stops, were not expressive enough. They proposed to me to either use small thumbnails, that show a small preview for the stop, or at least label the different rectangles.

Regarding the buttons, there were only two that were not very intuitive for some users, because when most of them used these buttons nothing happened. This was the case for the "Current Position"-button and the "Lock"-button. When exploring the software and tapping the "Current Position"-button without having left the predefined path, the user will not see any result. The same for the other button, where you only see changes when you lock the screen, move around and look on the projected screen. Most of the volunteers were so focussed on the iPad that they did not see that the image on the wall did not change. Therefore, one of them suggested to add some speech balloons which explain the functionalities that could be hard to understand at a first view, or to formulate it in his words: "make little clouds at the first startup explaining some functionalities".

Speech balloons during the first use of the software

A last thing I want to mention about the feedback, is that two people were disturbed that the "Next"- and "Back"- buttons were on both sides. I will come back on this objection in the next section, because this was one of the points I took a closer look at, while evaluating the records.

7.3.2   Indirect feedback

After analyzing the tapes, there were a few things that stood out directly and a few ones that were only noticeable when concentrating on certain movements of the users. The goal where I tried to find out, if there is a preferred manner to navigate to a certain position, when asked spontaneously to do so, can be answered with a clear "No". Obviously, every individual has a different conception of canvas presentations. Some of them see this art of presenting still as a presentation with stops that are spread in different directions, and prefer using the "Back"-button or the timeline to reach a specific stop. Others seem to see it more as a big presenting area, where the path should only help you to add a chronological order how you want to work off your

talk. These people tend to use the free scrolling to navigate to a certain area.

In the direct feedback, two participants proposed to only use one "Next"-button on the right side, and one "Back"-button on the left side. This is why I decided to look more closely at these two buttons and the result was quite astonishing. Every time a participant wanted to jump to the next position, he used the right "Next"-button, and every time he wanted to jump a position backwards, he tapped the left "Back"-button. As it seems, cultural analogies have manipulated our habits so much, that we automatically associate right with "forward" and left with "backward". Unfortunately, the main reason why these buttons had been placed symmetrically, could not be tested, because none of the participants was left-handed.

The participants only used the right "Next"-button and the left "Back"-button

Another problem that was very conspicuous, was the appearance of the timeline-handle on the right side. Most of the times, it was not recognized at all, but when it was, the first thoughts of the participants were that it had to be a vertical scrollbar. Furthermore, after being told what it was, a lot of people had problems hitting the small area. On the whole, this means that this slider should first of all be more recognizable, especially as a horizontal one, and secondly be bigger to make it easier to grab.

The timeline-handle was hardly recognized

Every single participant also tapped the "Next"-button a few times when he reached the last position , to make sure that there is really nothing that follows. This can be solved easily by hiding these buttons, or at least by changing their color, to make the users aware that they can not be pressed anymore.

The "Next"-buttons could be hidden when reaching the last position

For the rest, all the other functionalities were understood directly, and the participants also used the right familiar gestures to scroll through the presentation.

Chapter 8

Summary and future work

In this last chapter, I will again summarize the most important parts in my work, and at the very end I will give a few ideas what can still be improved in the future.

8.1 Summary and contributions

Fly Remote is a presentation tool for the iPad, which uses the new idea of ZUI interfaces. It is a stand-alone software, that still needs its computer version, called Fly, to create new presentations. Once they have been created and transmitted to the tablet, the presenter can start his talk and use either the buttons on top or intuitive gestures in the presentation area to navigate through the canvas presentation.

Fly Remote has a ZUI interface

I made a few investigations on how people hold the iPad, so that I could set up my interface accordingly. A collection of clicker remotes also helped me to see what such a remote control needs. And finally, I took a look at similar software, to get on the one hand even more inspirations, but on the other hand see eventual flaws that I would try to avoid.

The most interesting part is the the actual implementation. I based on the principles of a DIA cycle and started with a

Fly Remote can be used in landscape and portrait orientation

first prototype that contained the basic buttons like "next stop", "previous stop", "exit presentation", etc. While presenting it to a few friends and academics, I managed to grab some first impressions and critics. With this gained feedback, I continued with a second iteration in the DIA cycle. My second software implementation was already much more powerful than the first one. I did not only add a few more buttons, and a more interactive timeline, I also created a completely new alternative interface which focusses more on the notes. It can be accessed by turning the iPad 90 degrees and use its portrait orientation.

A user test at the end revealed remaining problems

The last step of this iteration was to get again some feedback about things that can still be improved in the future. Therefore, I did a user test, where I recorded seven people from two different angles, while they were giving a sample presentation with the software. I did not only gain direct feedback from the small questionnaire I handed to them, I also got some important indirect feedback after evaluating the videos. As my work ends at this stand of play, my findings, and an eventual first spontaneous solution to each of them, will be described in the next section.

8.2   Future work

8.2.1   Current Problems and their solutions

The evaluation of the feedback, gained from the last user study, revealed that the software still has a few weaknesses:

- The records of the participants showed, that during the presentation, everybody only used the right "Next"-button and the left "Back"-button to reach the next, respectively the previous spot. However all the participants were right-handed, so a minor test with a bunch of left-handed people could lead to the final conclusion that maybe only two big buttons are sufficient.

- In the timeline, there is also some potential for improvements. First, the small handle should be bigger

to make it easier to grab, and it should lead more to be recognized as a vertical popup-slider. For the timeline itself, small thumbnails of the stops would facilitate the talk of the users a lot.

- Another minor issue, that can be solved quite quickly, is that the user should be alerted when she reached the final position. My first solution would be to simply hide the "Next"-buttons in this case.

- One possibility to save even more space, is to hide the button-area too, just like the timeline area, and only slide it up if it is really needed. The most common buttons could then be implemented with gesture recognizers on the presentation area.

- Instead of using a whole area for the notes, they could also be presented in form of sticky notes in the presentation itself. But this is more a problem which first of all concerns Fly itself, and not the mobile version of it.

- As one participant mentioned, small speech balloons at the first startup, explaining the different buttons, could help the user too, getting a first overview of the interface.

8.2.2 Further completions

Another missing feature that has been mentioned by one of the users was the lack of the possibility do do some spontaneous annotations. Often, when a presenter uses a tablet, she wants to add some notes or drawings during the talk on her slides. Fly Remote grants all the pre-conditions to make this possible in the future.

Do some spontaneous annotations

A further completion could be the adding of a map which shows the whole presentation and the area which is currently displayed. An example how this could look, can be seen on figure 8.1.

A small map could help orienting

So far, I just focussed on the presenting part of presentations. To cope with its name, the mobile applications

Figure 8.1: A small map in the lower right corner could show the whole canvas presentation, and the current position of the presentation could be represented by a red rectangle.

should also let the user edit his presentations, and even create new ones, on the fly.

Appendix A

TITLE OF THE FIRST APPENDIX

This appendix contains my first sketches of how I thought people would hold the iPad when giving a talk. Nine of the twelve sketches represent users that only use one hand whereas the other three sketches represent users that use both hands to carry the iPad.
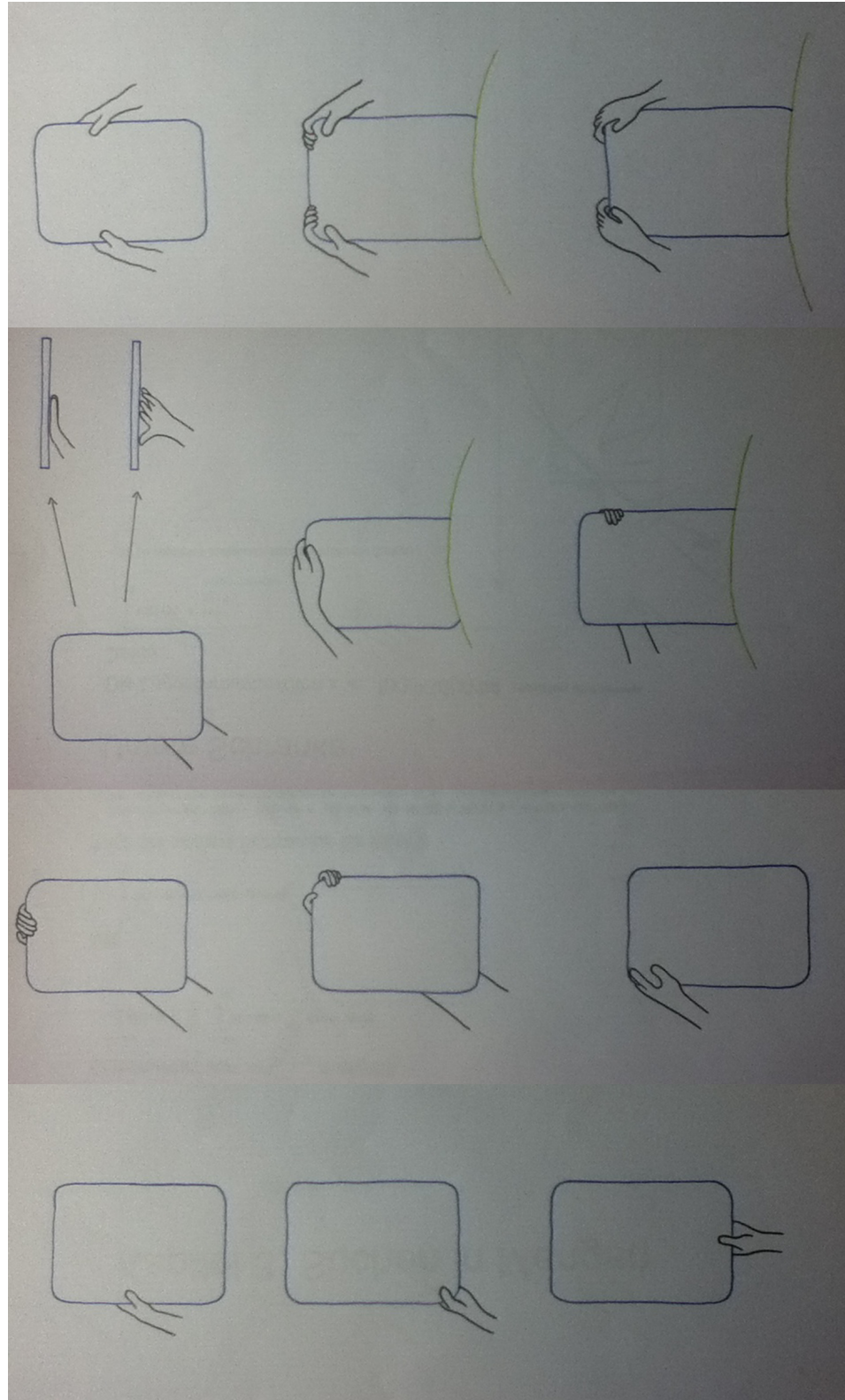
Figure A.1: My first sketches of how I thought people would hold the iPad.

Appendix B

Collection of Clicker Remotes

A list of a few extraordinary clicker remotes can be found on the following pages. Their specialities are listed in a table, so they can be compared quite fast.

	AMP13EU (Targus)	Keyspan PR-US2 (Tripplite)	Keyspan PR-PRO4 (Tripplite)	SP800 (Satechi)	RemotePoint Onyx (SMK-Link)	R800 (Logitech)	GP240-001 (Gyration)
Visual feedback							
Current slide	✗	✗	✗	✗	✗	✗	✗
Next slide	✗	✗	✗	✗	✗	✗	✗
Timer	✗	✗	✗	✗	✓	✓	✗
Navigate							
Joystick	✗	✓	✗	✗	✗	✗	✗
Gyroskop	✗	✗	✓	✗	✗	✗	✓
Buttons	✗	✗	✗	✓	✗	✗	✗
Memory							
intern	✗	✗	✗	✗	✗	✗	✗
SD card	✗	✗	✗	✗	✗	✗	✗
Additional							
Software	✗	✗	✗	✗	✗	✗	✓
USB-Receiver-Stick	✓	✓	✓	✓	✓	✓	✗
USB-Base-Station	✗	✗	✗	✗	✗	✗	✓
Windows/Mac	✓ / ✓	✓ / ✓	✓ / ✓	✓ / ✓	✓ / ✓	✓ / ✗	✓ / ✓*
Programm buttons	✗	✗	✗	✗	✗	✗	✓
Laserpointer	✓	✓	✓	✓	✓	✓	✓
Black screen	✗	✗	✓	✗	✗	✓	✓

* Limited functionality

	K72336US (Kensington)	K72367US (Kensington)	RemotePoint Jade (SMK-Link)	VP6450 Pilot Pro (SMK-Link)	2screens remote (Edwin Lam)	iClickr (Sentic)	MyPoint (Didonai LLC)
Visual feedback							
Current slide	✗	✗	✗	✗	✓	✓	✓
Next slide(s)	✗	✗	✗	✗	✗	✓	✓
Timer	✗	✗	✗	✗	✓	✓	✓***
Navigate							
Joystick	✗	✗	✓	✓	✗	✗	✗
Gyroskop	✗	✗	✗	✗	✗	✗	✗
Buttons	✗	✗	✗	✗	✗	✗	✗
Memory							
intern	✓ (1GB)	✗	✗	✗	✗	✗	✗
SD card	✗	✓ (max. 32GB)	✗	✗	✗	✗	✗
Additional							
Software	✗	✗	✓*	✗	✓**	✓	✓
USB-Receiver-Stick	✓	✓	✓	✓	✗	✗	✗
USB-Base-Station	✗	✗	✗	✗	✗	✗	✗
Windows/Mac	✓ / ✓	✓ / ✓	✓ / ✓	✓ / ✓	✗ / ✗	✓ / ✓	✓ / ✓
Programm buttons	✗	✗	✓	✗	✗	✗	✗
Laserpointer	✓	✓	✓	✓	✗	✗	✗
Black screen	✓	✓	✓	✓	✗	✗	✗

* Used to program buttons   **Connects to iPad   ***Needs button click to be shown

	VP4300 (SMK-LINK)	LP107T (August)	LP108M (August)	4 in 1 (Hiro)	PR-EZ1 (Keyspan)	Wireless USB Laser Pointer (Photon)
Visual feedback						
Current slide	×	×	×	×	×	×
Next slide	×	×	×	×	×	×
Timer	×	✓	×	×	×	✓
Navigate						
Joystick	×	×	✓**	×	×	×
Gyroskop	×	×	×	×	×	×
Buttons	×	×	×	✓	×	✓
Memory						
intern	✓ (32GB)	×	×	×	×	×
SD card	×	×	×	×	×	×
Additional						
Software	✓*	×	×	×	×	×
USB-Receiver-Stick	✓	✓	✓	✓	✓	✓
USB-Base-Station	×	×	×	×	×	×
Windows/Mac	✓ / ×	✓ / ✓	✓ / ✓	✓ / ×	✓ / ✓	✓ / ✓
Programm buttons	✓	×	×	×	×	×
Laserpointer	✓	✓	✓	✓	✓	✓
Black screen	×	✓	✓	✓	✓	✓
Special things			**Trackerball			Vibration (Timer up)

* Used to program button

PR-PRO4

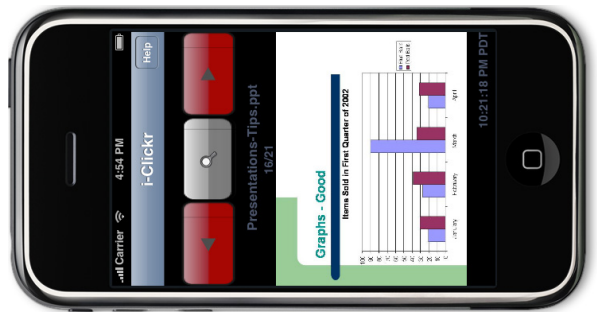GP240-001

RemotePoint
Onyx

PR-US2

SP800

AMP13EU

R800

VP6450
Pilot Pro

MyPoint

RemotePoint
Jade

K72367US

K27336US

2Screens Remote Disconnect

Status: Connected with Lillian's iPad 2

Page: 2 / 6 (SamplePDF.pdf)

Go to Page

Bookmark

Timer

This file contains presenter notes in slide numbers (1), (2) and (4).

This file contains 2 lines of presenter notes in slide number Two.

2screens remote

i-Clickr

iClickr remote

LP 108M

Wireless USB
Laser Pointer

LP 107T

PR-EZ1

KEYSPAN

Visual

Audio

ESC

FS

MUTE
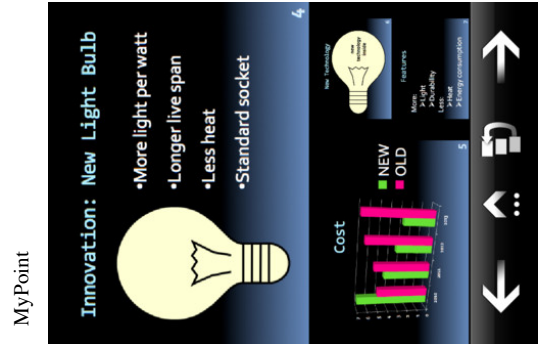
VP 4300

4 in 1

Bibliography

Uri Alon. How to give a good talk. *Molecular cell*, 36(2):165–167, 10 2009. URL `http://linkinghub.elsevier.com/retrieve/pii/S1097276509007424`.

Apple. Apple's investor news. URL: `http://files.shareholder.com/downloads/AAPL/1939813539x0x563104/e4cb1db1-75d5-4678-85d4-bef7dab6f2e4/Q2_2012_Form_10-Q_As_Filed_.pdf`, a.

Apple. icloud file management. URL: `http://www.http://developer.apple.com/library/mac/#documentation/FileManagement/Conceptual/FileSystemProgrammingGUide/iCloud/iCloud.html`, b.

B.B. Bederson. Pad++: A zooming graphical interface for exploring alternate interface physics, 1994.

Ben Bederson and Jon Meyer. Implementing a zooming user interface: experience building pad++. *Softw. Pract. Exper.*, 28(10):1101–1135, August 1998. ISSN 0038-0644. doi: 10.1002/(SICI)1097-024X(199808)28:10⟨1101::AID-SPE190⟩3.0.CO;2-V. URL `http://dx.doi.org/10.1002/(SICI)1097-024X(199808)28:10<1101::AID-SPE190>3.0.CO;2-V`.

Berkeley. Pointers on giving a talk. URL: `http://www.eecs.berkeley.edu/~messer/Bad_talk.html`.

Ruth Crosby. Oral delivery in the middle ages. 11(1):88–110, 1936. URL `http://www.jstor.org/stable/2846876`.

Jean-luc Doumont. The cognitive style of powerpoint: Slides are not all evil. *Technical Communication*, 52(1):64–70, 2005. URL http://www.ingentaconnect.com/content/stc/tc/2005/00000052/00000001/art00008.

Duke. How to give a talk. URL: http://www.cs.duke.edu/brd/Teaching/Giving-a-talk/giving-a-talk.html.

Lance Good and Benjamin B Bederson. Zoomable user interfaces as a medium for slide show presentations. *Information Visualization*, 1(1):35–49, 2002. doi: 10.1057/palgrave.ivs.9500004. URL http://ivi.sagepub.com/content/1/1/35.abstract.

Laszlo Laufer, Peter Halacsy, and Adam Somlai-Fischer. Prezi meeting: collaboration in a zoomable canvas based environment. In *Proceedings of the 2011 annual conference extended abstracts on Human factors in computing systems*, CHI EA '11, pages 749–752, New York, NY, USA, 2011. ACM. ISBN 978-1-4503-0268-5. doi: 10.1145/1979742.1979673. URL http://doi.acm.org/10.1145/1979742.1979673.

M.D. LeCompte and J.J. Schensul. *Designing and Conducting Ethnographic Research*. Ethnographer's Toolkit, Second Edition Series. AltaMira Press, 2010. ISBN 9780759118690.

Leonhard Lichtschlag. Fly: An organic authoring tool for presentations. Diploma thesis, RWTH Aachen University, November 2008.

Leonhard Lichtschlag, Thorsten Karrer, and Jan Borchers. Fly: a tool to author planar presentations. In *Proceedings of the CHI 2009 Conference on Human Factors in Computing Systems*, Boston, MA, USA, April 2009. ACM Press.

Tomer Moscovich, Karin Scholz, John F. Hughes, and David H. Salesin. Customizable presentations.

Donald A. Norman. *The design of everyday things*. Basic Books, September 2002. ISBN 0465067107.

Jason Pascoe, Nick Ryan, and David Morse. Using while moving: Hci issues in fieldwork environments. *ACM*

Trans. Comput.-Hum. Interact., 7(3):417–437, September 2000. ISSN 1073-0516. doi: 10.1145/355324.355329. URL `http://doi.acm.org/10.1145/355324.355329`.

Simon L. Peyton Jones, John Hughes, and John Launchbury. How to give a good research talk. *SIGPLAN Not.*, 28(11):9–12, November 1993. ISSN 0362-1340. URL `http://dl.acm.org/citation.cfm?id=165564.903972`.

F.P. Polo. *Contra Arma Verbis: Der Redner Vor Dem Volk in der Späten Römischen Republik*. Heidelberger althistorische Beiträge und Epigraphische Studien. F. Steiner, 1996. ISBN 9783515068543. URL `http://books.google.lu/books?id=ZZtpFPVtzcsC`.

Mark Schoeberl and Brian Toon. Ten secrets to giving a good scientific talk. URL: `http://www.cgd.ucar.edu/cms/agu/scientific_talk.html`.

Texas. Giving a conference talk. URL: `http://www.cs.utexas.edu/~dahlin/professional/goodTalk.pdf`.

TFD. timeline. URL: `http://www.thefreedictionary.com/timeline`.

International Training and Education Center for Health / University of Washington. Qualitative interviews, 2008. URL `http://www.go2itech.org`.

E.R. Tufte. *Visual explanations: images and quantities, evidence and narrative*. Graphics Press, 1997. URL `http://books.google.de/books?id=d-NOAAAAMAAJ`.

Julie Wagner, Stéphane Huot, and Wendy Mackay. Bitouch and bipad: designing bimanual interaction for hand-held tablets. In *Proceedings of the 2012 ACM annual conference on Human Factors in Computing Systems*, CHI '12, pages 2317–2326, New York, NY, USA, 2012. ACM. ISBN 978-1-4503-1015-4. doi: 10.1145/2208276.2208391. URL `http://doi.acm.org/10.1145/2208276.2208391`.

B. Weidenmann. *100 Tipps& Tricks für Pinnwand und Flipchart*. Beltz Weiterbildung. Beltz, 2008. ISBN 9783407364579. URL `http://books.google.de/books?id=tXXW42WSfJcC`.

R.S. Weiss. *Learning From Strangers: The Art and Method of Qualitative Interview Studies*. Free Press, 1995. ISBN 9780684823126. URL `http://books.google.de/ books?id=i2RzQbiEiD4C`.

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