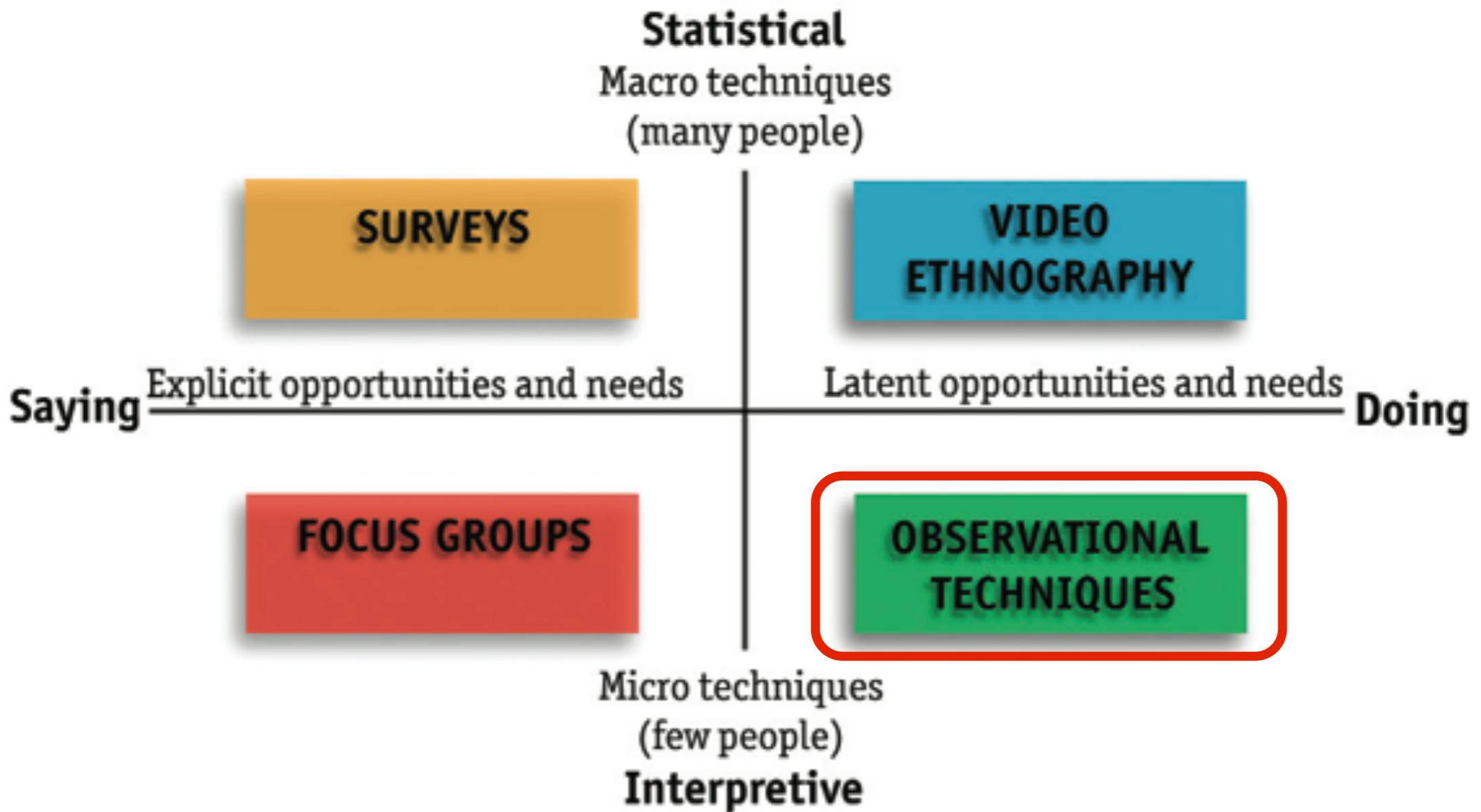


# Prototyping UX - From Sketch to Prototype

**Interaction Design - Alexander Wiethoff - SS2016**

Ludwig-Maximilians Universität München

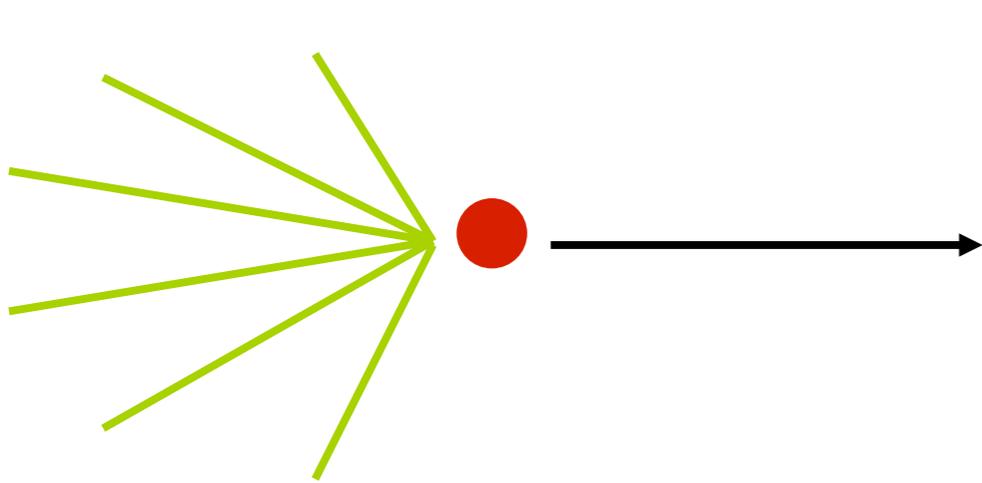
# **Recap Session Day 4:**



source: [8]

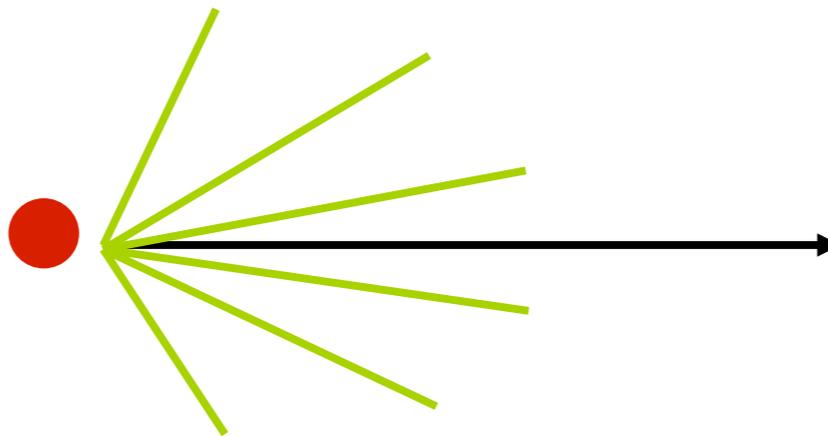
# ANALYSIS

**Definition of the system**  
What is the problem?



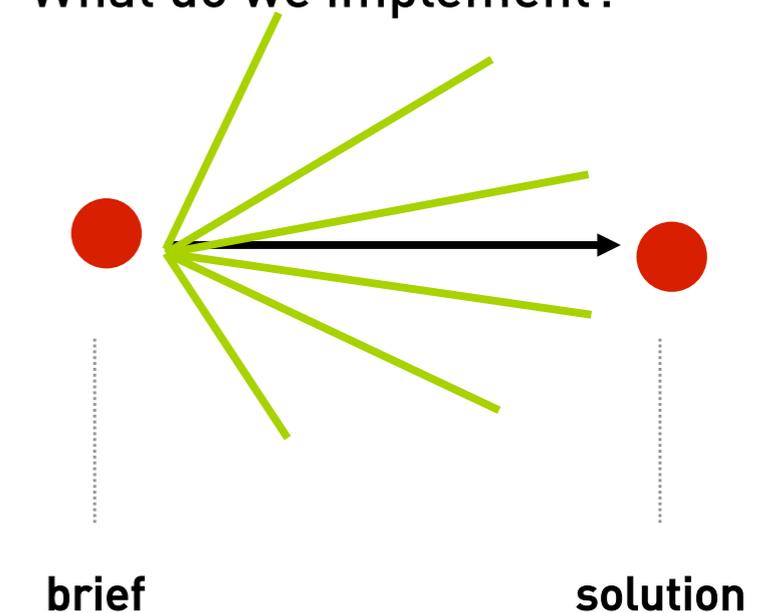
# EVALUATION

**Possible alternatives**  
What future do we want?



# SYNTHESIS

**Design of final solutions**  
What do we implement?



The designer is a  
'problem-scouter'

The designer is a  
'story-teller'

The designer is an  
'executor'



source: [4]

# Fly on the Wall

## How

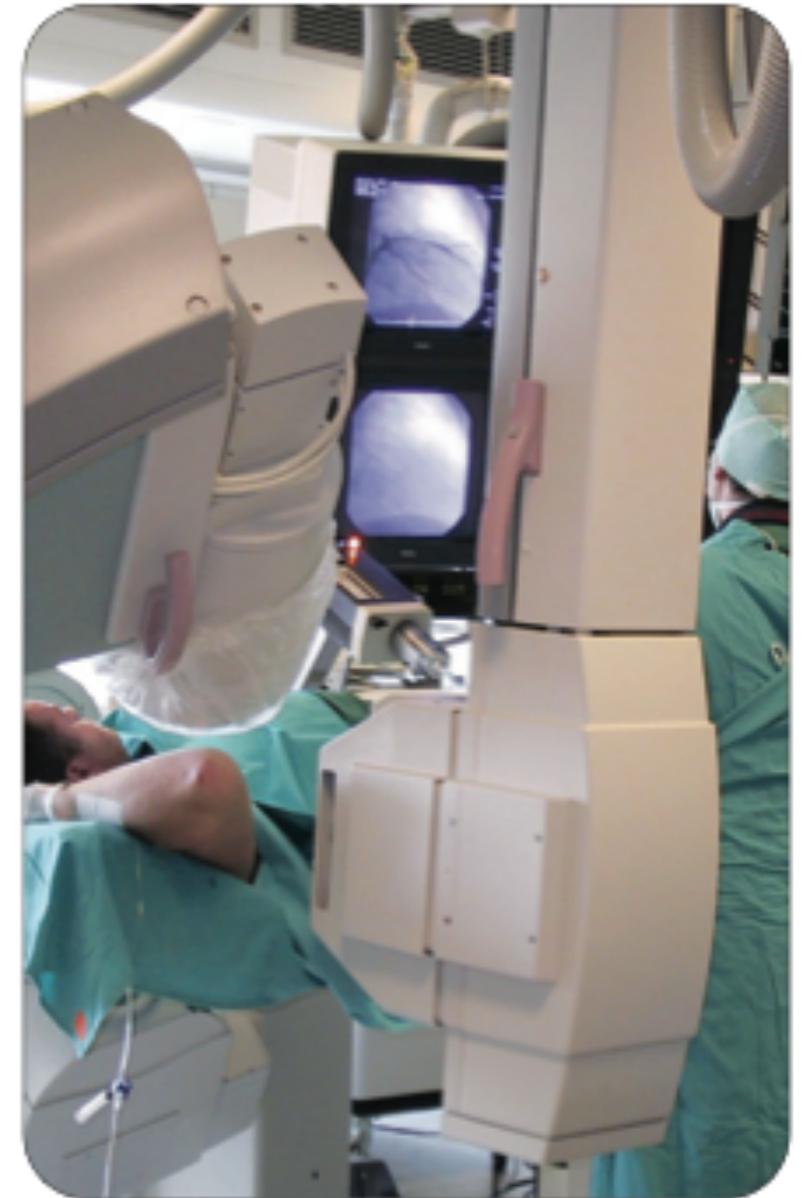
Observe and record behaviour within its context, without interfering with people's activities.

## Why

It is useful to see what people do in real contexts and time frames, rather than accept what they say they did after the fact.

## Example

By spending time in the operating room, the designers were able to observe and understand the information that the surgical team needed.



FLY ON THE WALL

source: [7]

# Four key issues

- **Setting goals**
  - Decide how to analyse data once collected
- **Relationship with participants**
  - Clear and professional
  - Informed consent when appropriate
- **Triangulation**
  - Use more than one approach
- **Pilot studies**
  - Small trial of main study

# Interviews

**Unstructured** - are not directed by a script. Rich but not replicable.

**Structured** - are tightly scripted, often like a questionnaire. Replicable but may lack richness.

**Semi-structured** - guided by a script but interesting issues can be explored in more depth. Can provide a good balance between richness and replicability.

# Running the interview

- **Introduction** – introduce yourself, explain the goals of the interview, reassure about the ethical issues, ask to record, present any informed consent form.
- **Warm-up** – make first questions easy and non-threatening.
- **Main body** – present questions in a logical order
- **A cool-off period** – include a few easy questions to defuse tension at the end
- **Closure** – thank interviewee, signal the end, e.g, switch recorder off.

# Summary Creating a Good Questionnaire:

- Keep your questionnaire **short**. In fact, the shorter the better.
- Use **simple and direct language**. The questions must be clearly understood by the respondent.
- Begin with a few **non-threatening** and interesting items.
- Place the **most important items in the first half** of the questionnaire
- Leave **adequate space** for respondents to make comments.
- Perform **iterative pre-tests** and eliminate or replace questions that are hard to understand or lead to useless / unsatisfying results.
- Accommodate **all answers**

# Summary

- Three main data gathering methods: interviews, questionnaires, observation
- Four key issues of data gathering: goals, triangulation, participant relationship, pilot
- Interviews may be structured, semi-structured or unstructured
- Observation may be direct or indirect, in the field or in controlled setting
- Techniques can be combined depending on study focus, participants, nature of technique and available resources



source: [8]

# Prototyping UX - From Sketch to Prototype

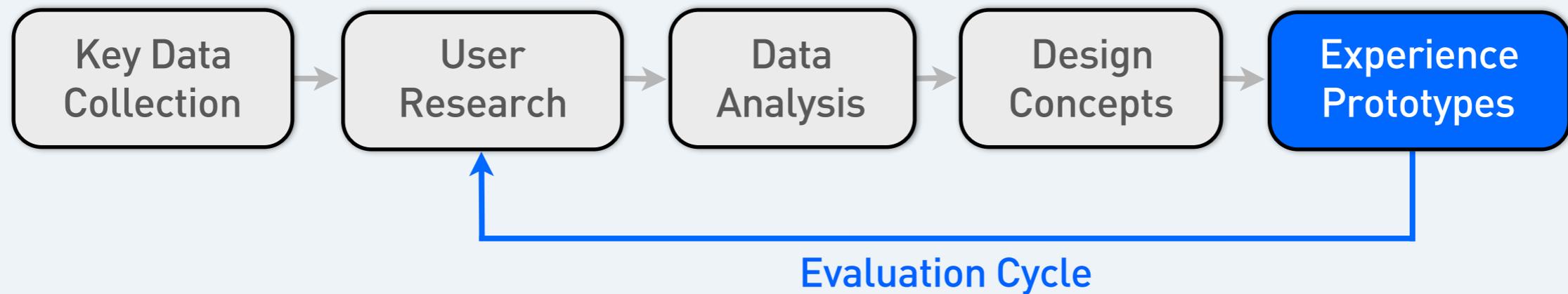
**Interaction Design - Alexander Wiethoff - SS2016**

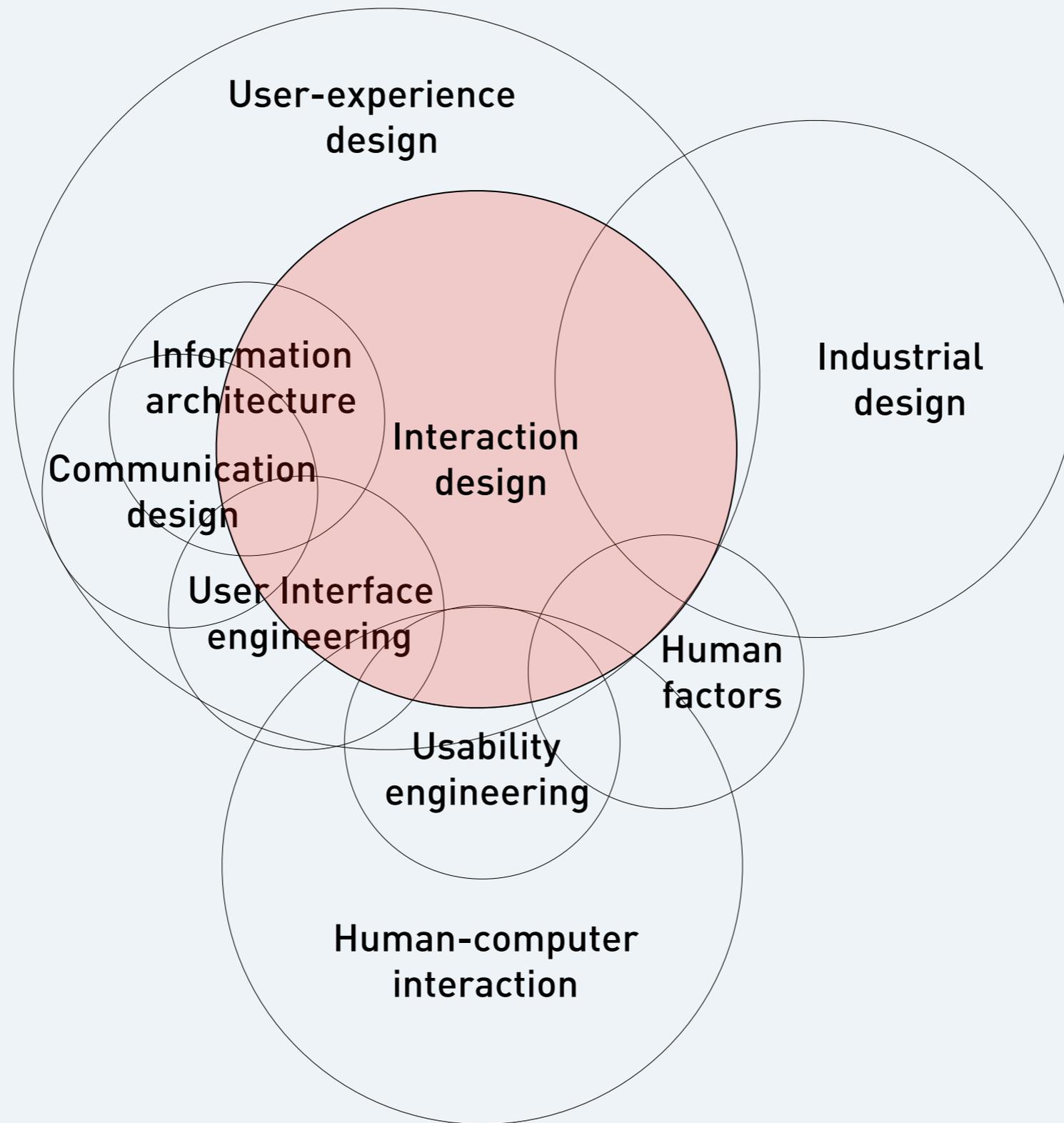
Ludwig-Maximilians Universität München

# Overview:

- Intro & Designprocess Phase
- Values and Levels of Prototyping
- UX Prototyping Techniques
- Prototyping Case Study

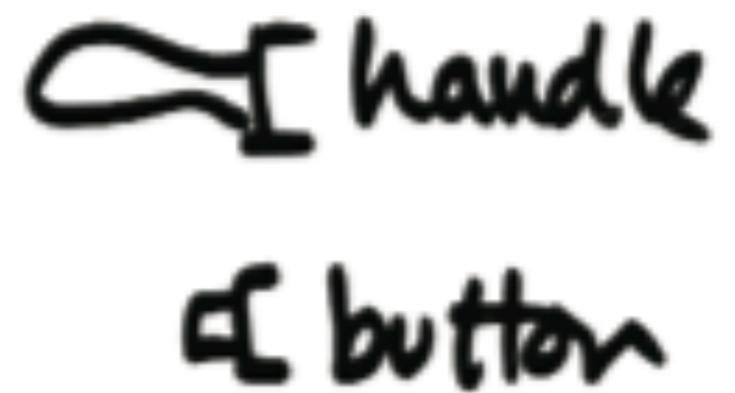
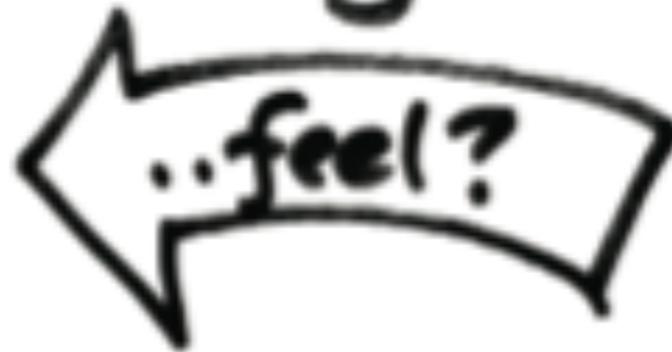
# Overview





# INTERACTION

How do you...



# User Experience Design



# Overview

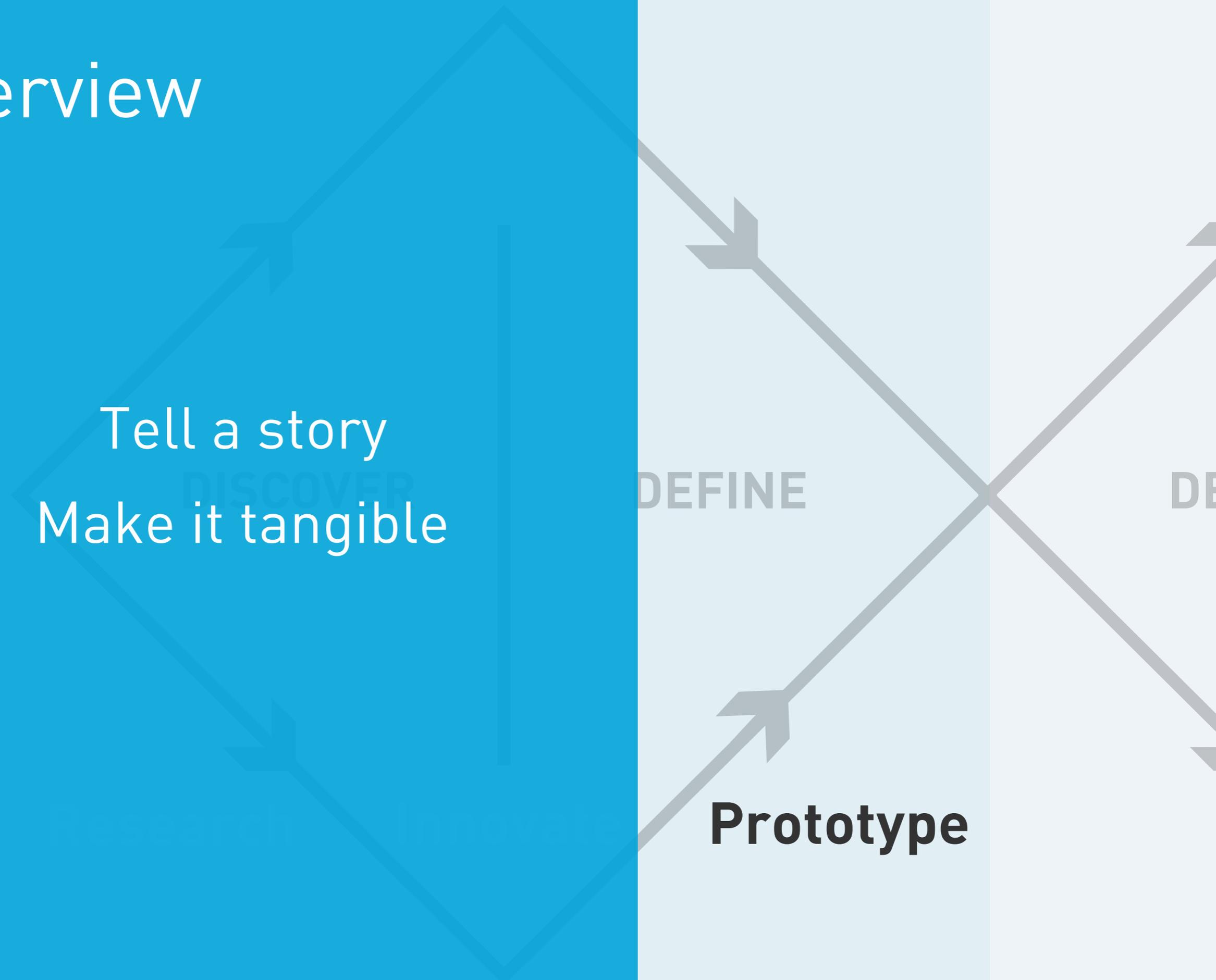
Tell a story  
Make it tangible

DISCOVER

DEFINE

DE

**Prototype**



# Overview:

- Intro & Designprocess Phase
- Values and Levels of Prototyping
- UX Prototyping Techniques
- Prototyping Case Study

**For the Designer:** Exploration  
Visualisation  
Feasibly  
Inspiration  
Collaboration

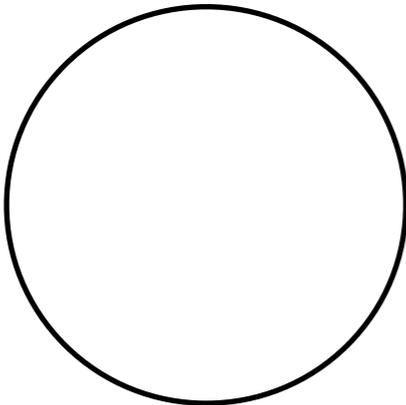
**For the End User:** Effectiveness / Usefulness  
A change of viewpoint  
Usability  
Desirability

**For the Producer:** Conviction  
Specification  
Benchmarking

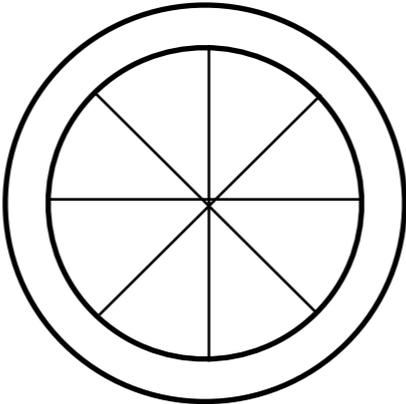
**It's really hard to design products by focus groups. A lot of times, people don't know what they want until you show it to them.**

Steve Jobs

# Fidelity v. Resolution



low resolution  
low fidelity



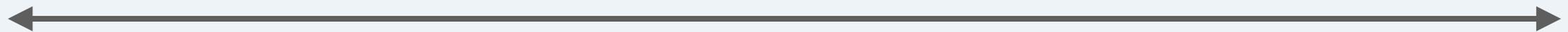
high resolution  
low fidelity



high resolution  
high fidelity

Low Fidelity

High Fidelity



Open Discussion

Sharp Opinions

Prompting Required

Self Explanatory

Quick and Dirty

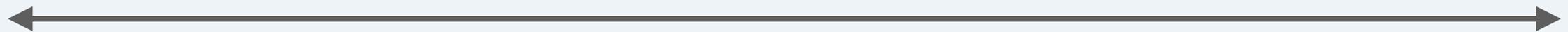
Deliberate and Refined

Early Validation

Concrete Ideas

Low Resolution

High Resolution



Less Details

More Details

Focus on core interactions

Focus on the whole

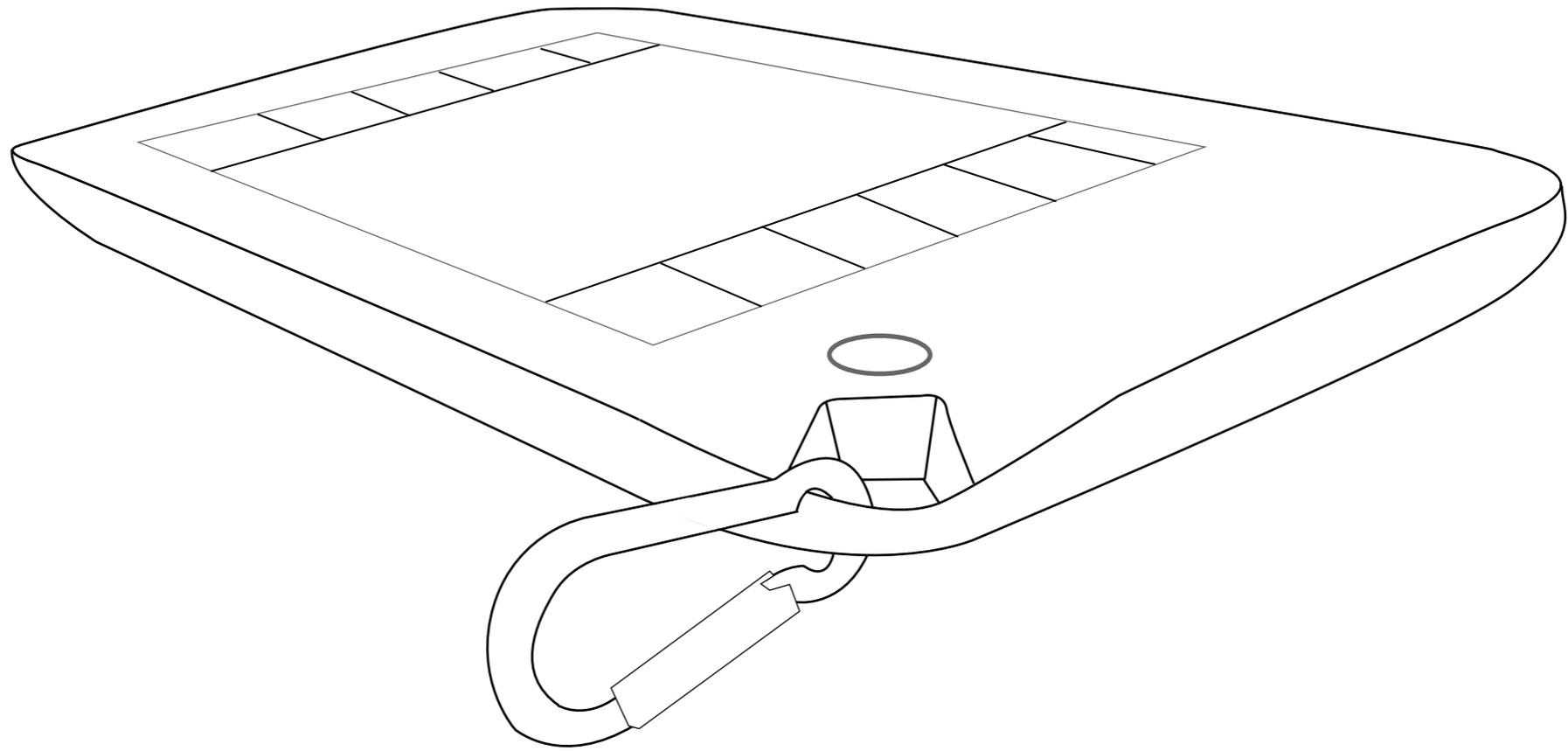
Quick and Dirty

Deliberate and Refined

Early Validation

Concrete Ideas

1st Iteration  
low-res/low-fi

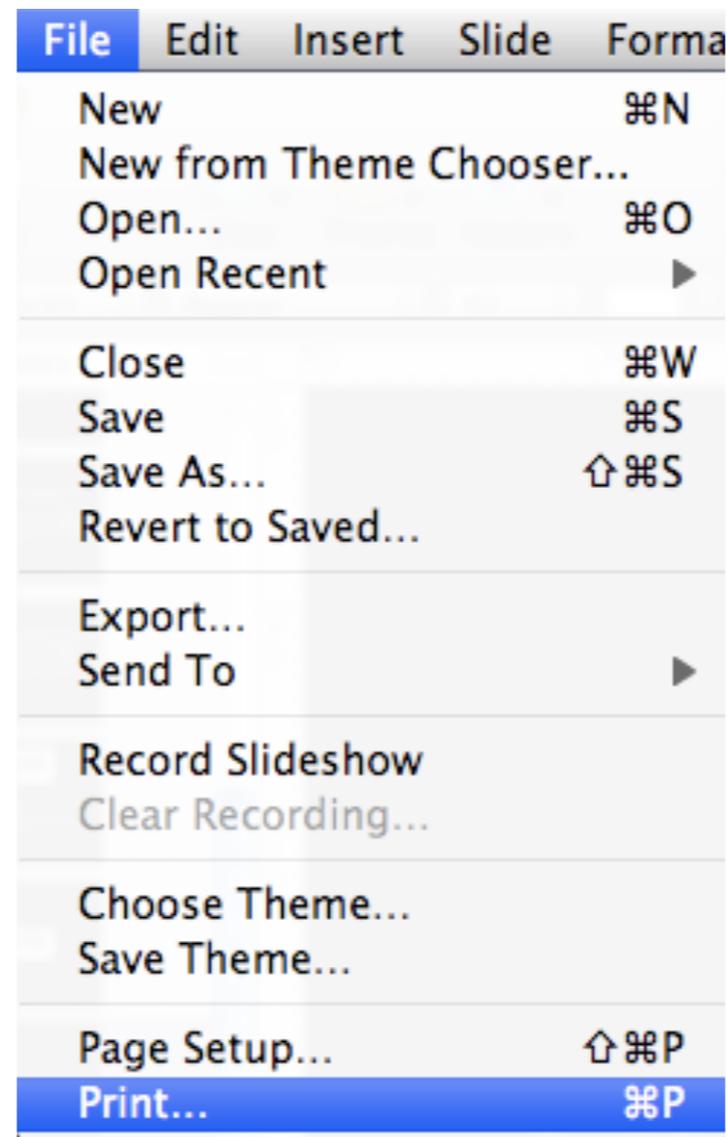


4th Iteration  
high-res/high-fi

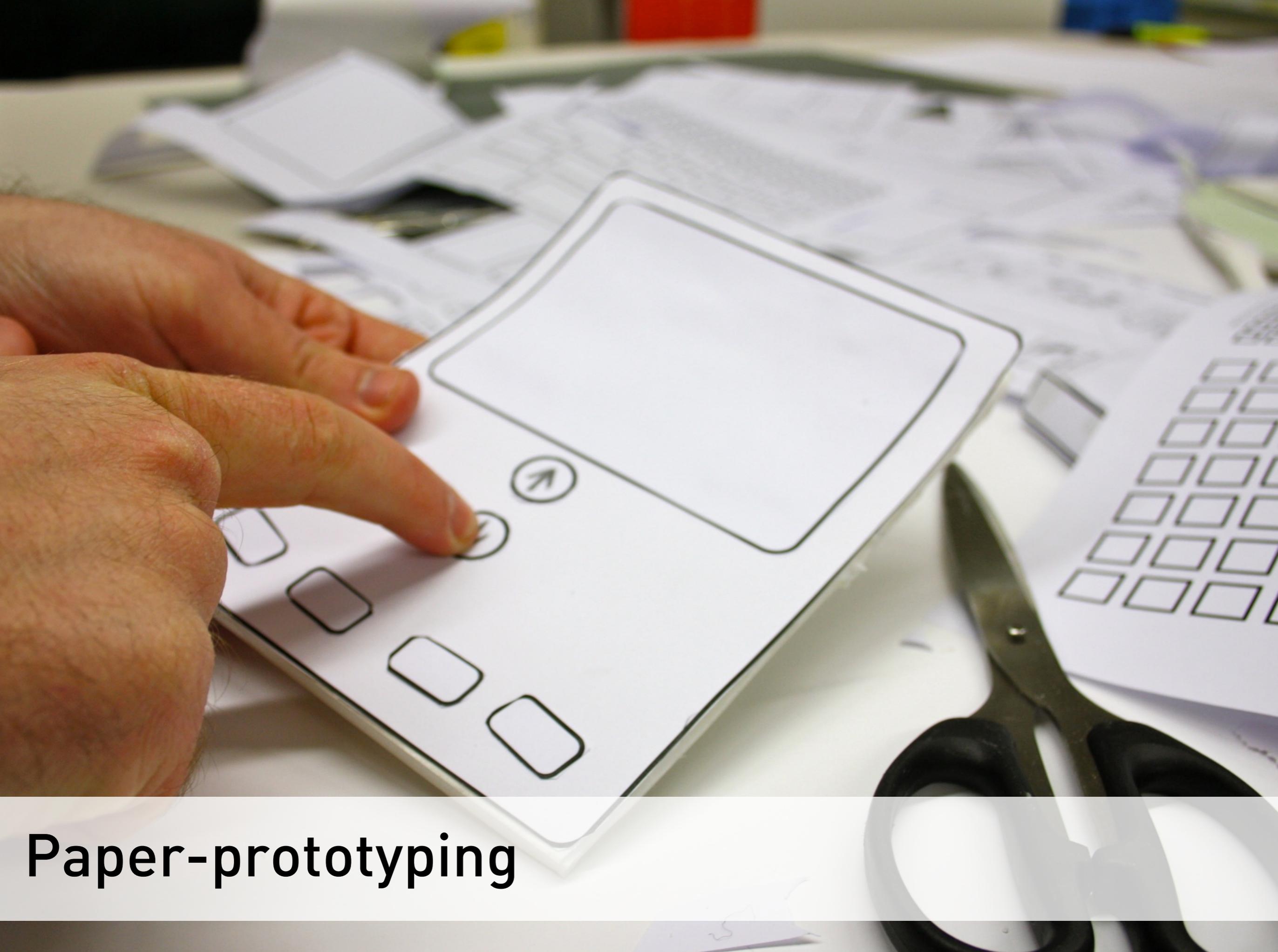




80/20 rule



**A principle for setting priorities: users will use 20% of the features of your product 80% of the time. Focus the majority of your design and development effort (80%) on the most important 20% of the product.**



**Paper-prototyping**

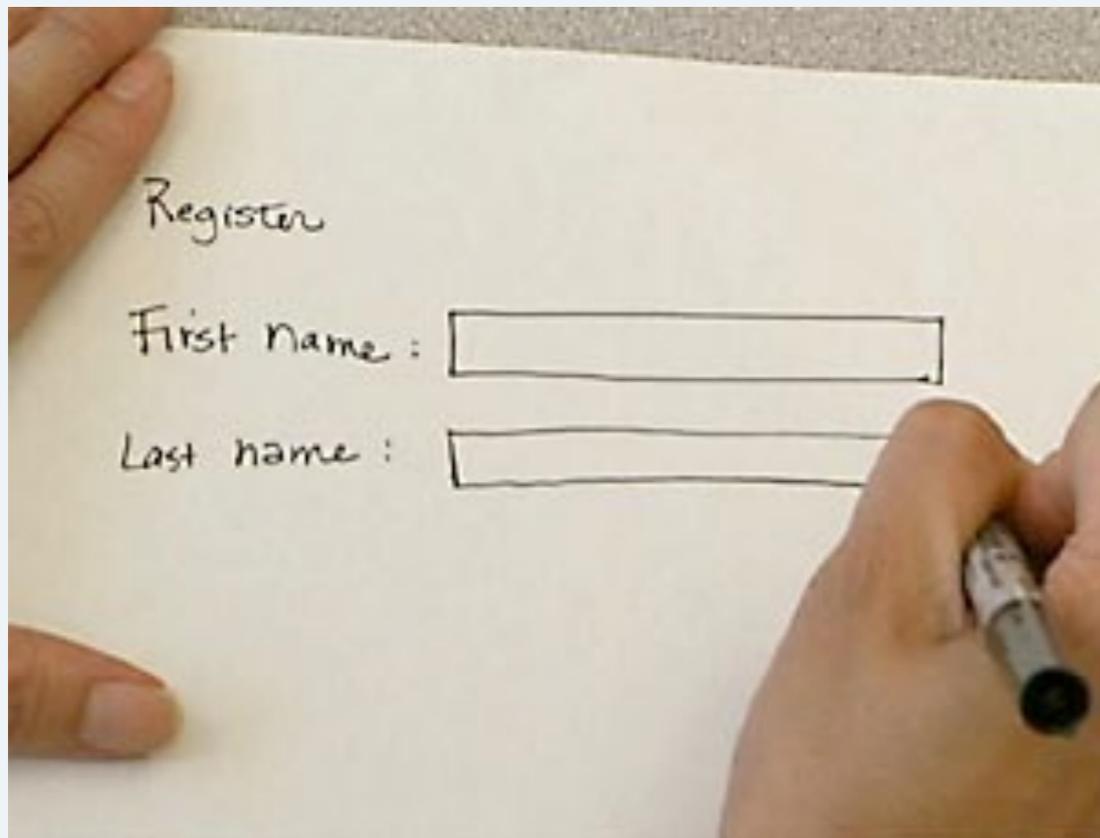
# What is it?

Paper prototyping is a widely used method in the user-centered design process, a process that helps developers to create products/screen based applications that meets the user's expectations and needs.

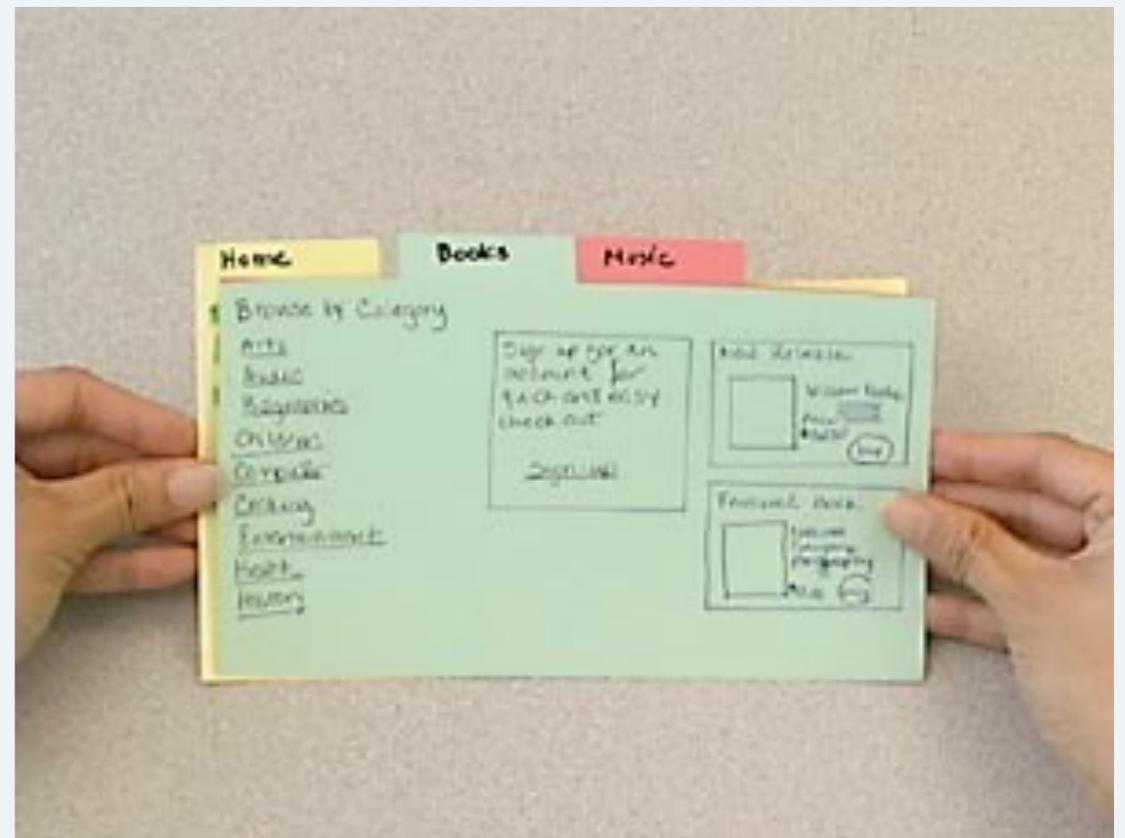
It is **throwaway prototyping** and involves creating rough, even hand sketched, drawings of an interface to use as prototypes, or models, of a design.

# History

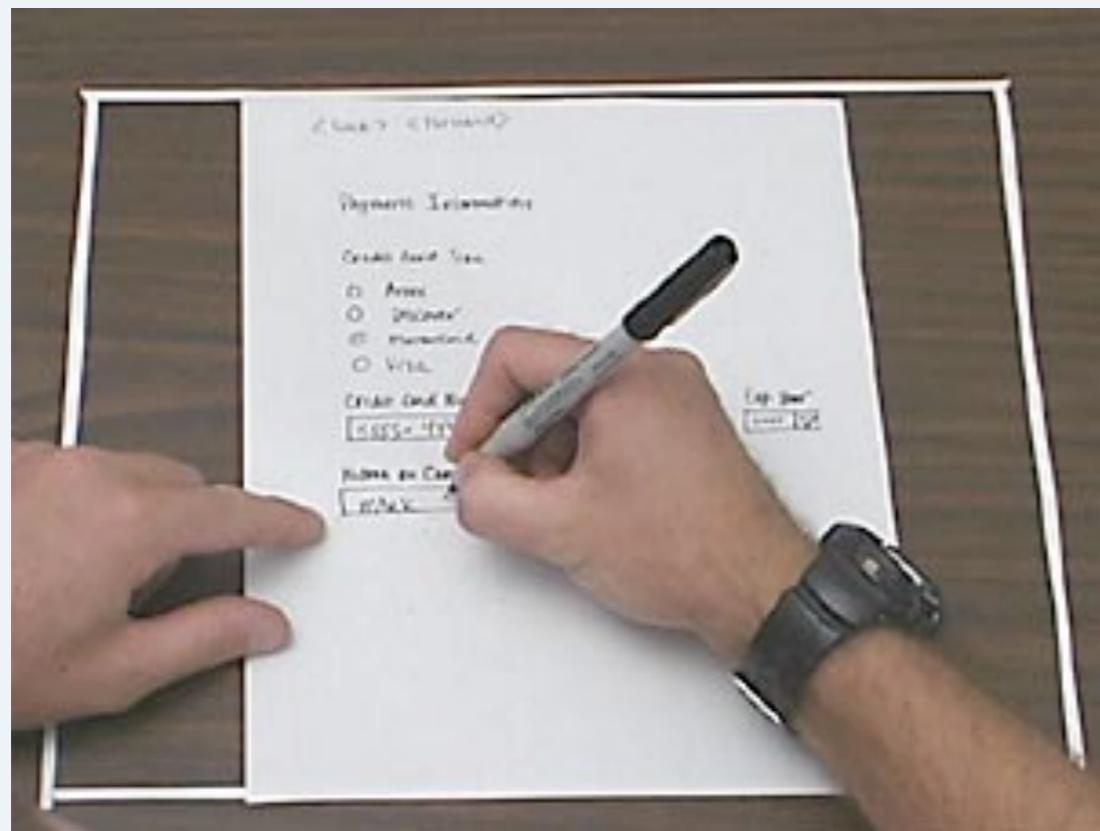
Paper prototyping started in the mid 1980s and then became popular in the mid 1990s when companies such as IBM, Honeywell, Microsoft, and others started using the technique in developing their products.



Paper prototype of a typical form-filling screen



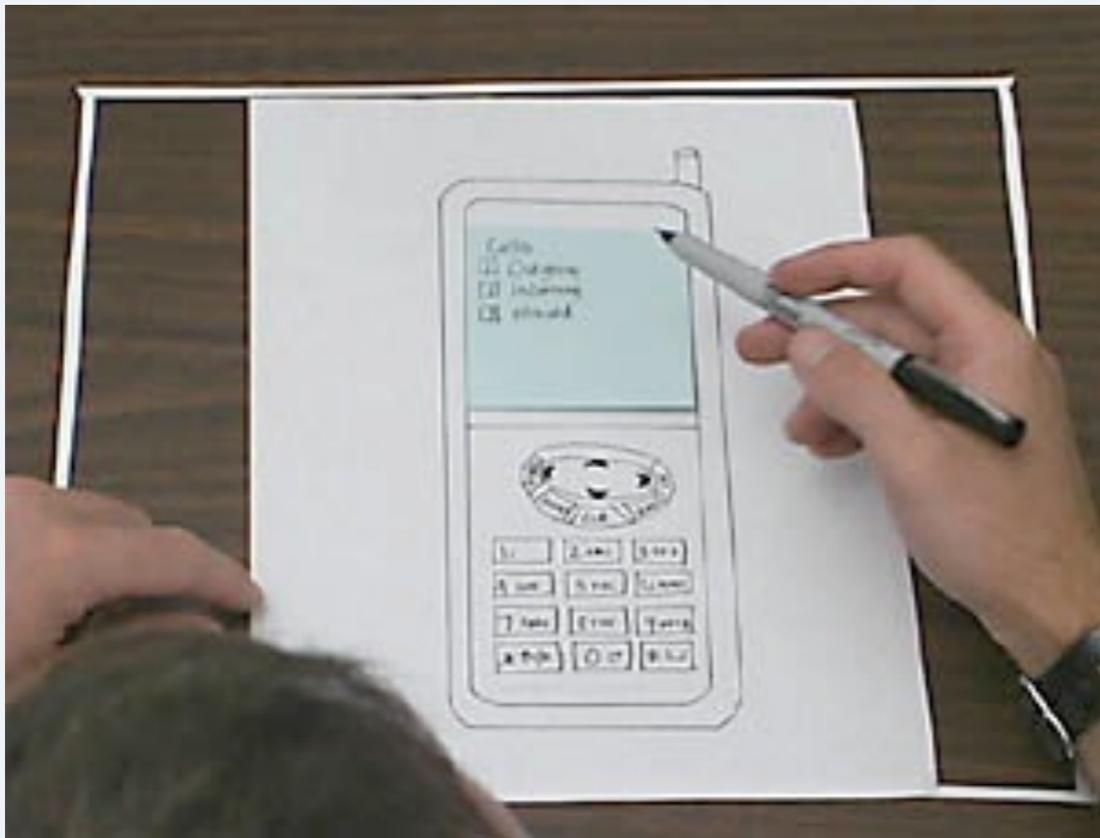
Paper prototype of a tabs-based design



User test of a low-fidelity paper prototype of a website



Typical set-up of the usability laboratory for a test session with a paper prototype



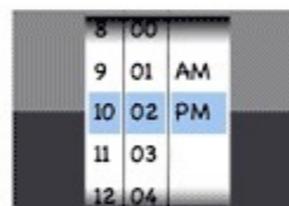
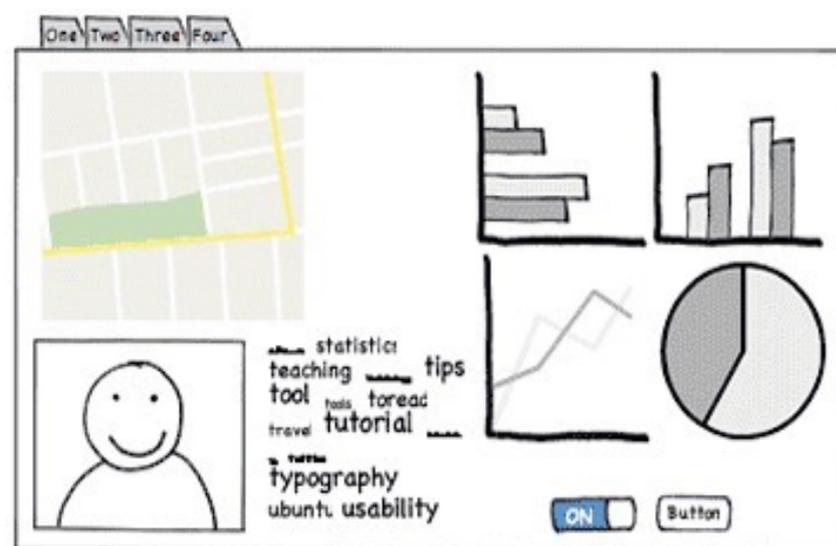
User test of a device-based interaction



User test of a high-fidelity paper prototype of a homepage.



Testing hardware user interfaces: mockup of a kiosk.



- Use F for closed folders
- Use F for open folders
- You may also use this
- and this
- or this
- and this
- or even this
- and this
- Use - for a file icon
- or \_ to leave a space for your own
- use spaces or dots for hierarchy
- Just like
- this



<http://www.balsamiq.com/products/mockups>  
PopApp

Handwritten notes on a piece of paper with a header and a table. The header contains the word "Dawn" and some illegible text. The table has several columns and rows of handwritten entries.

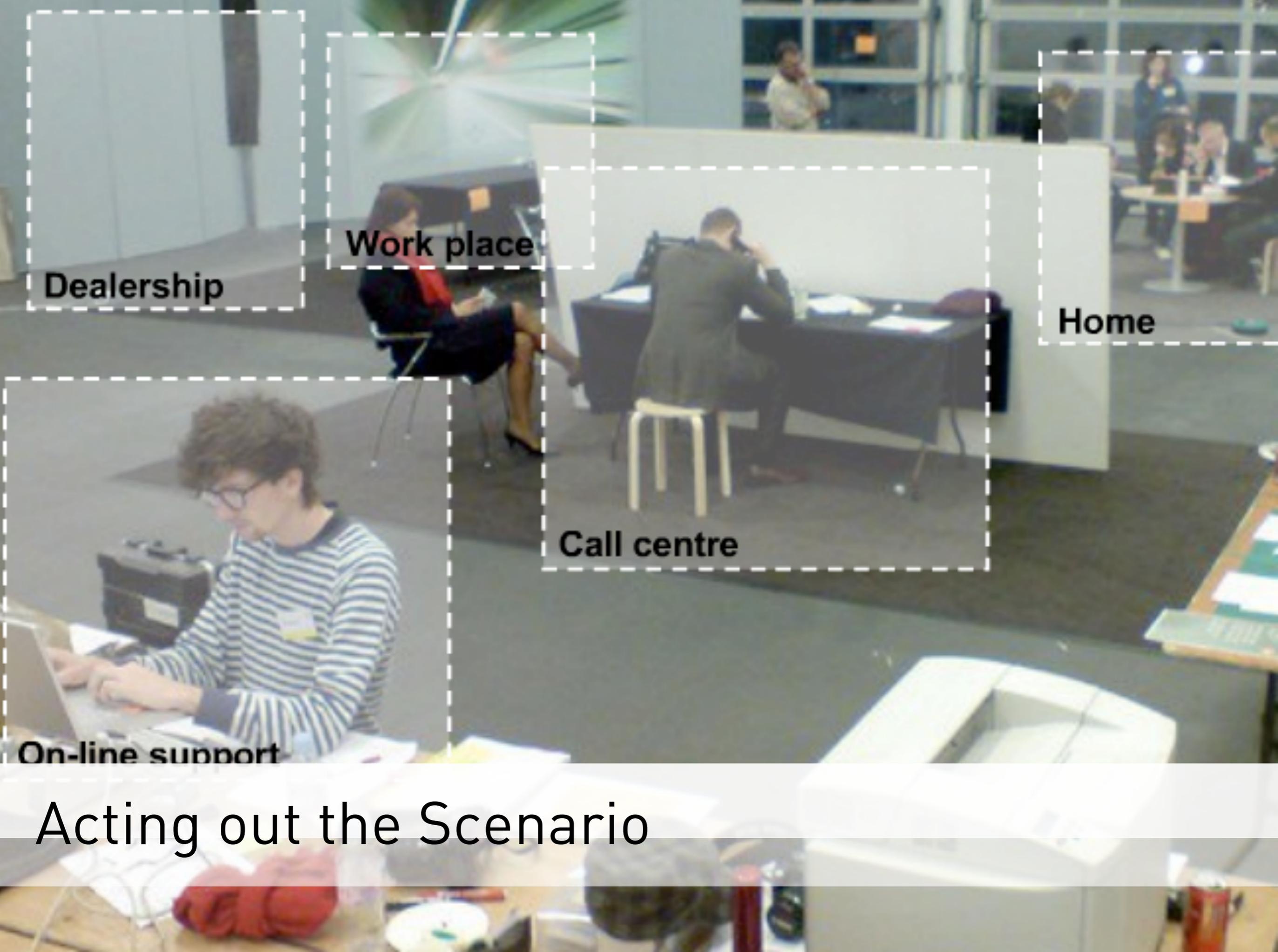
Header: Dawn [illegible] [illegible]

| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
|-------------|-------------|-------------|-------------|-------------|-------------|
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |

Source: YouTube



# Video-prototyping



**Dealership**

**Work place**

**Home**

**Call centre**

**On-line support**

**Acting out the Scenario**



Quick Kiosk Mock-up

EXAMPLES

**Video Prototypes**

low resolution

low fidelity

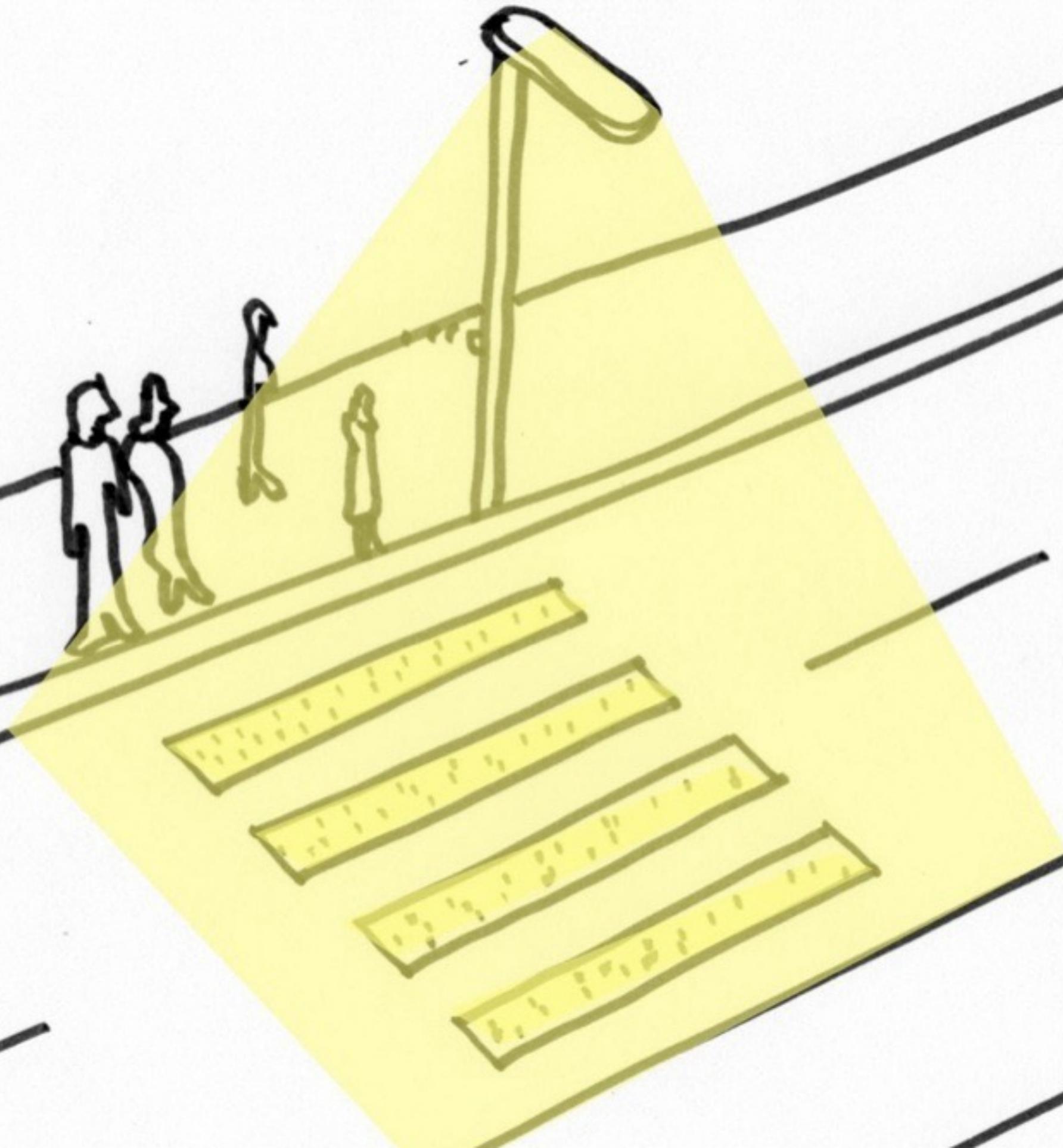
**(a whole new world)**

A whole new world

low resolution

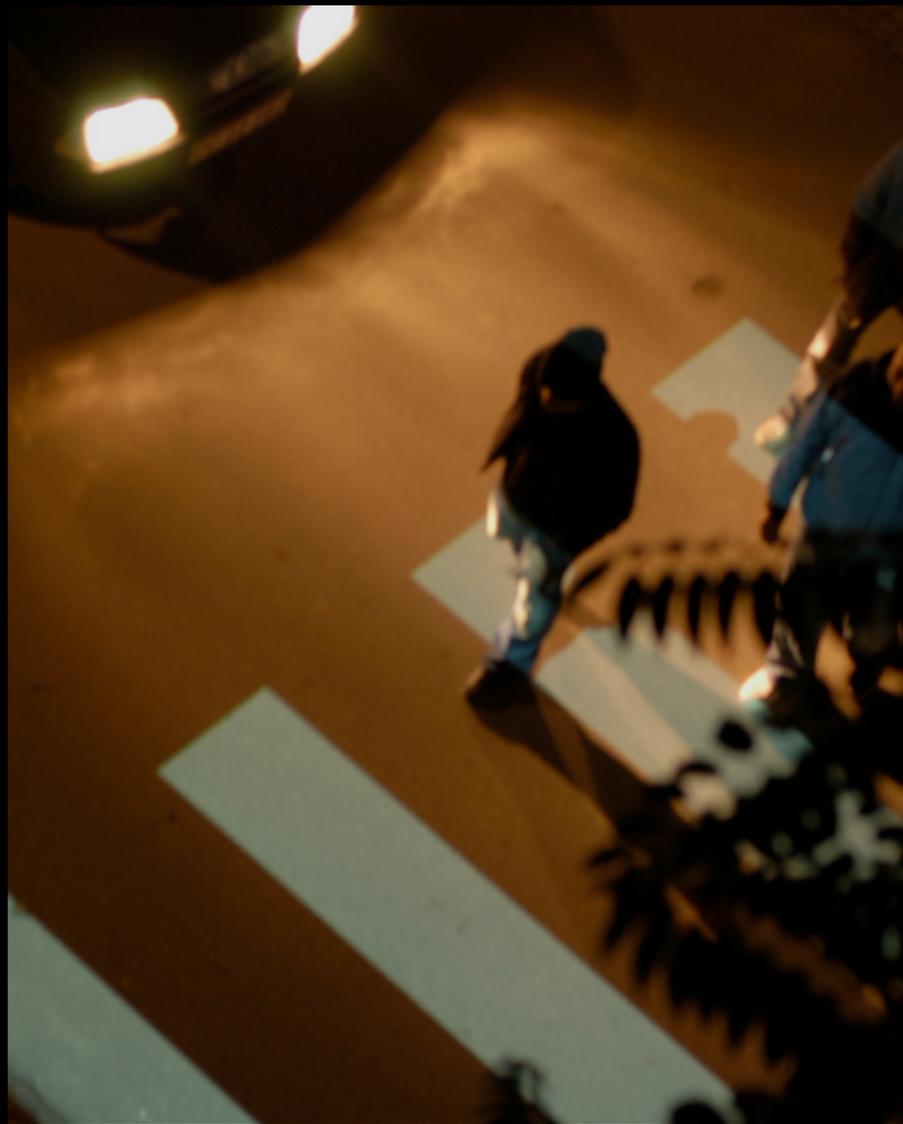
high fidelity

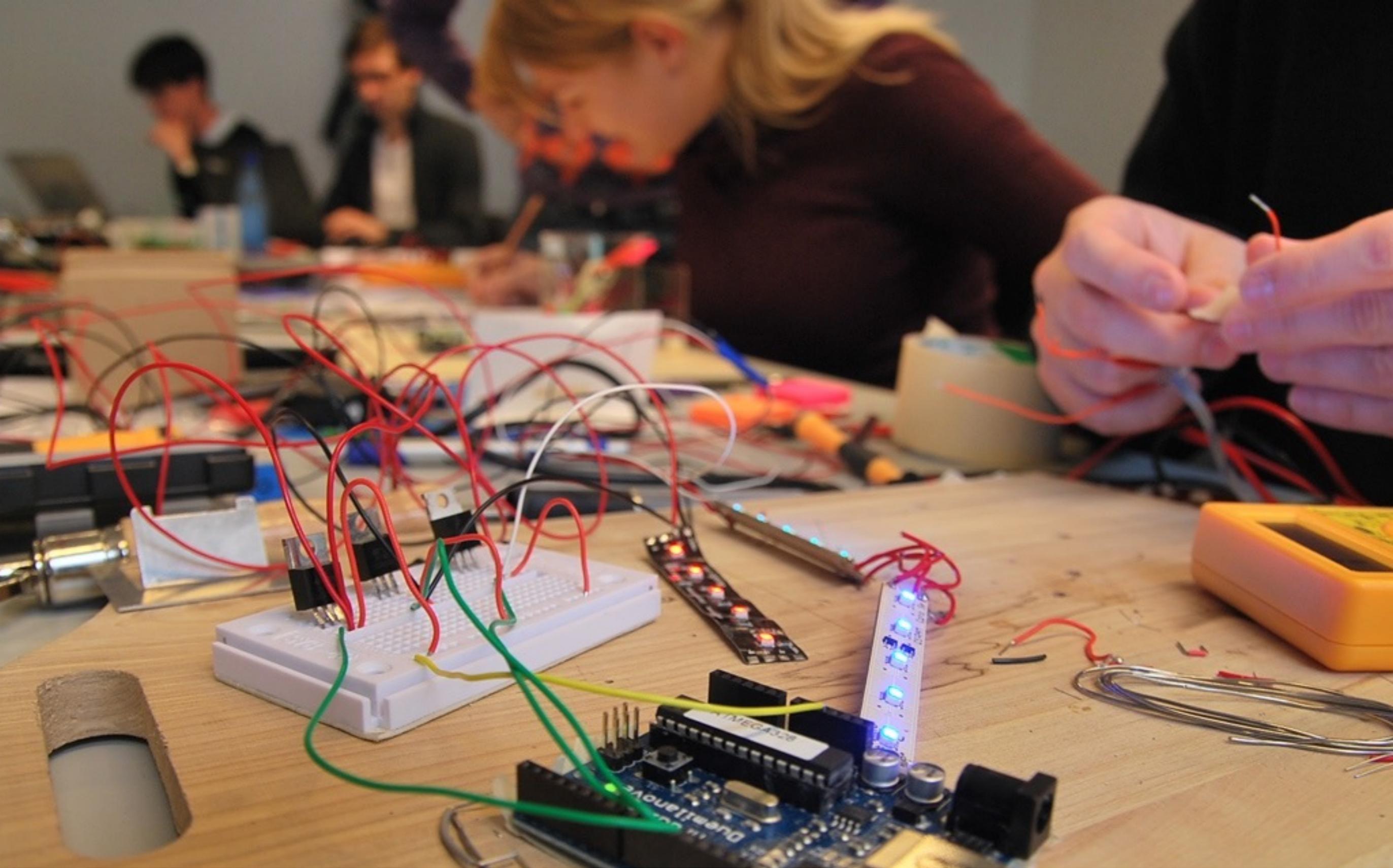
**(crossing on demand)**



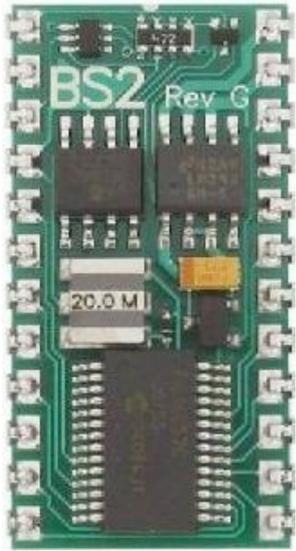
# Zebra Zone

# The Smoke & Mirror Approach

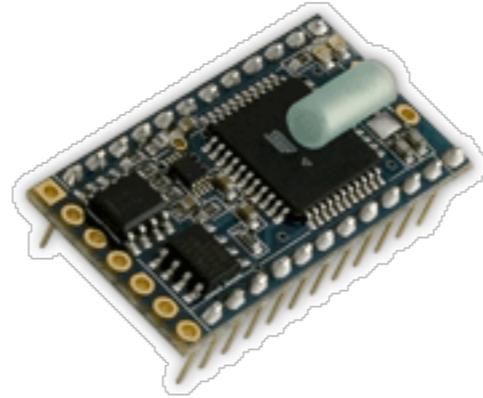




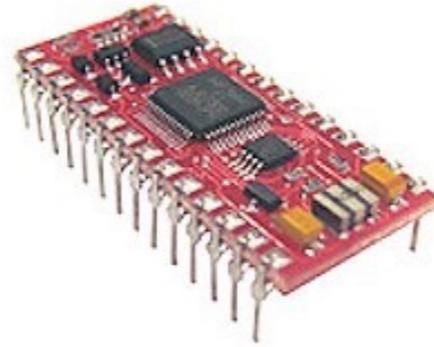
# Sketching with Hardware



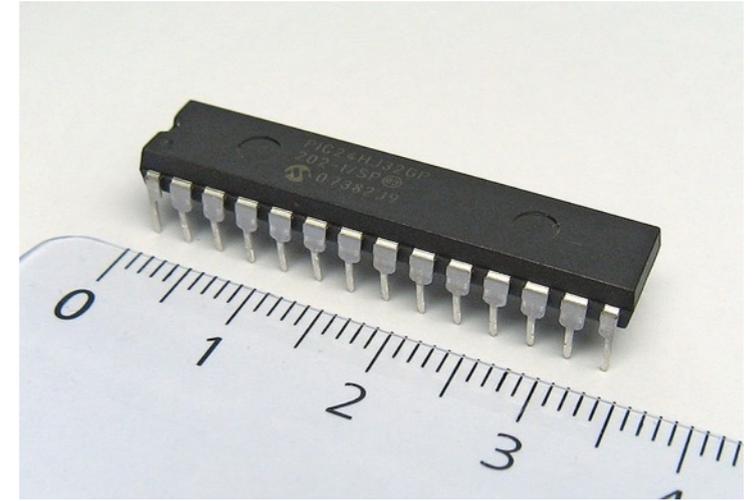
basic stamp



bx 24



basic atom



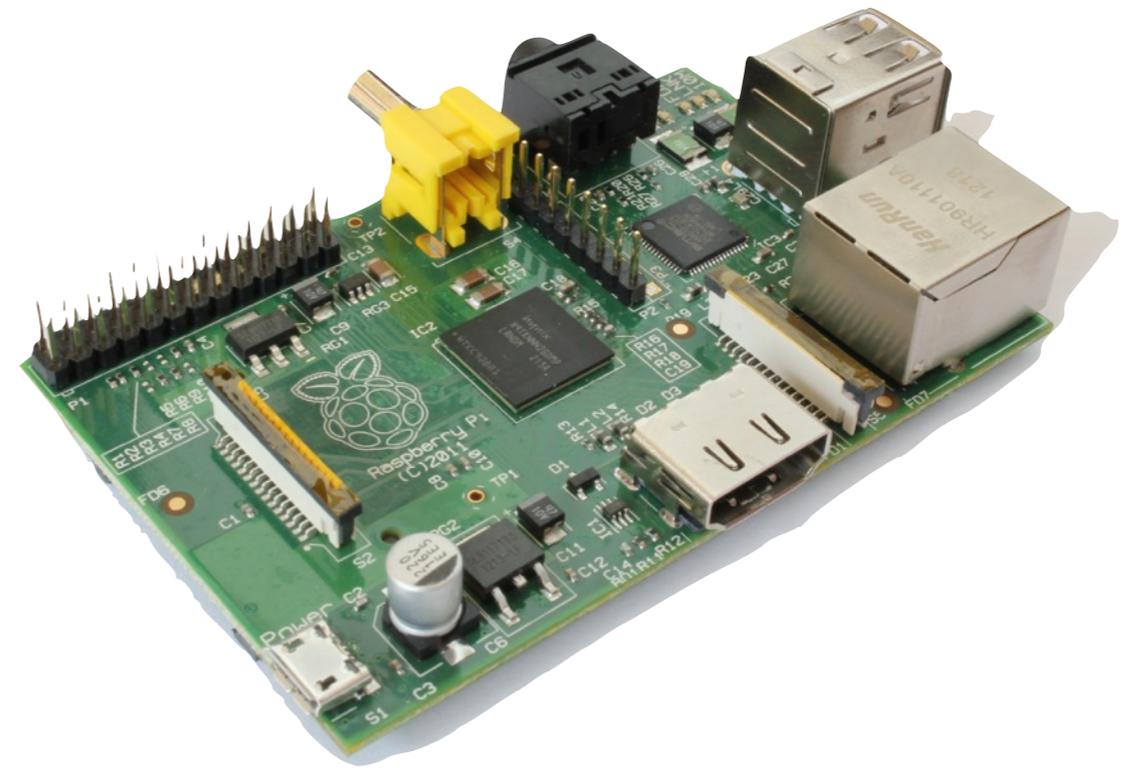
pic



**Assembly**



Atmel AT Mega 328



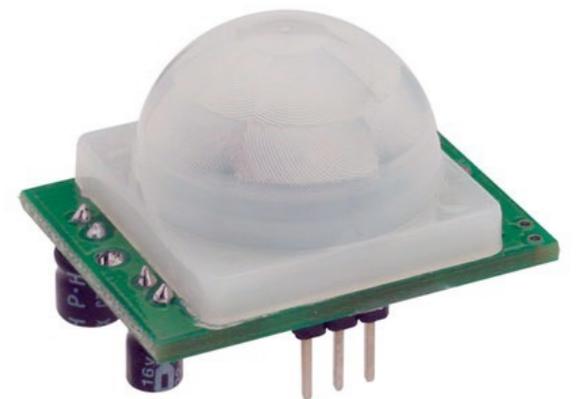
Raspberry Pi



Thermistor



Bend Sensor



PIR Sensor



Force Sensor



Potentiometer



Magnet Switch



Distance IR Sensor

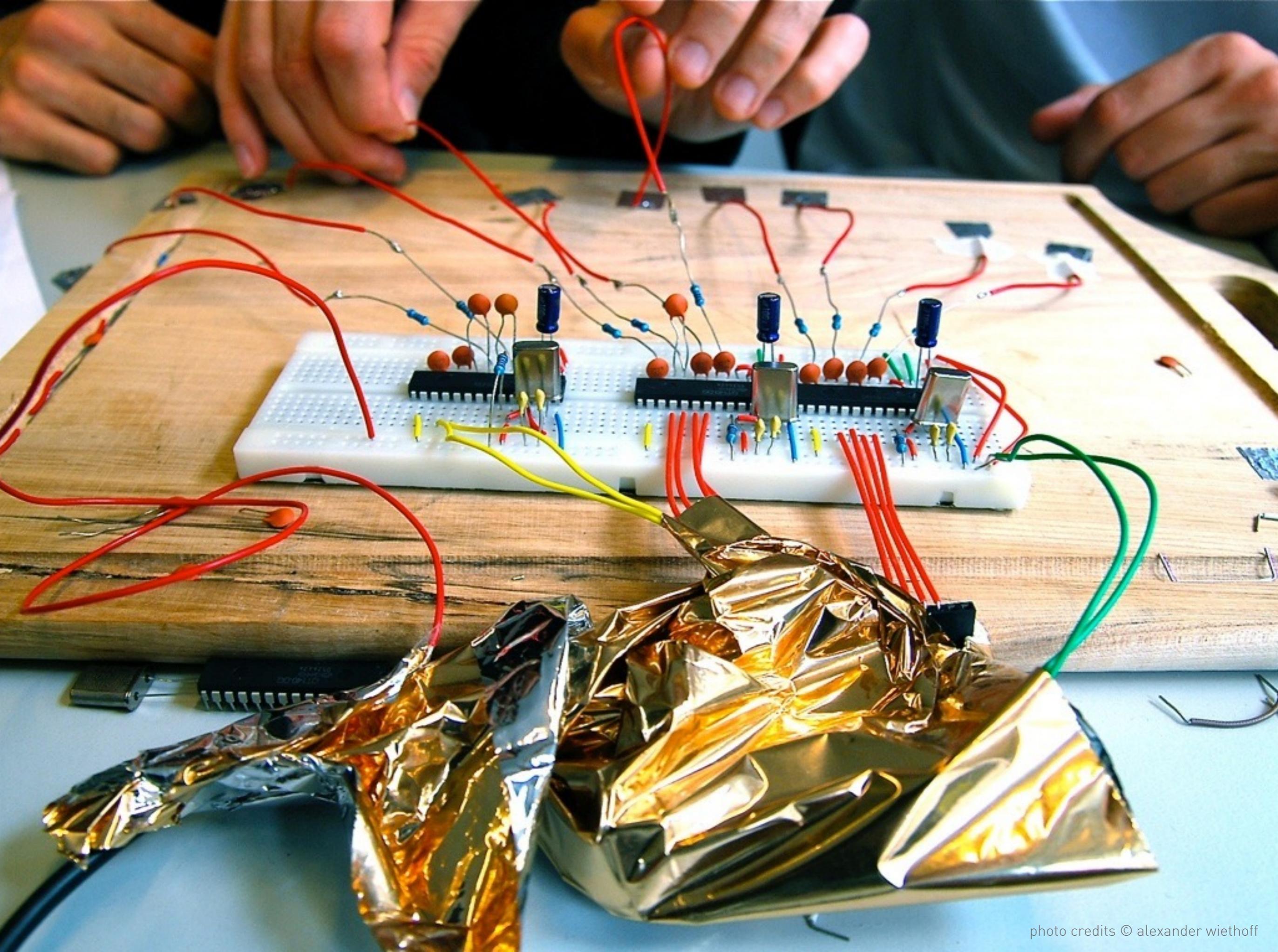


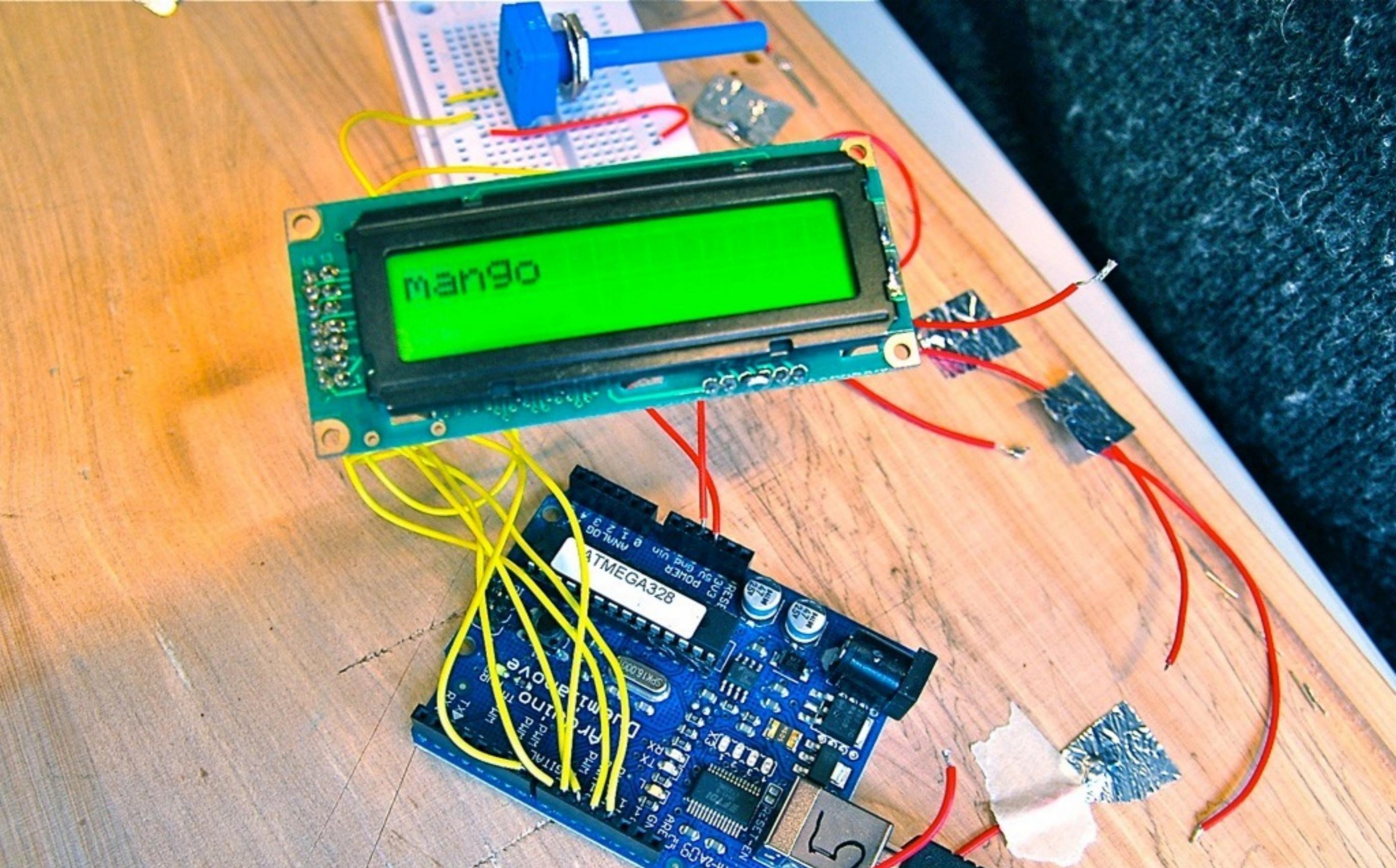
Touch QT Sensor



Ultrasound Sensor







**Quick** video overview

# Overview:

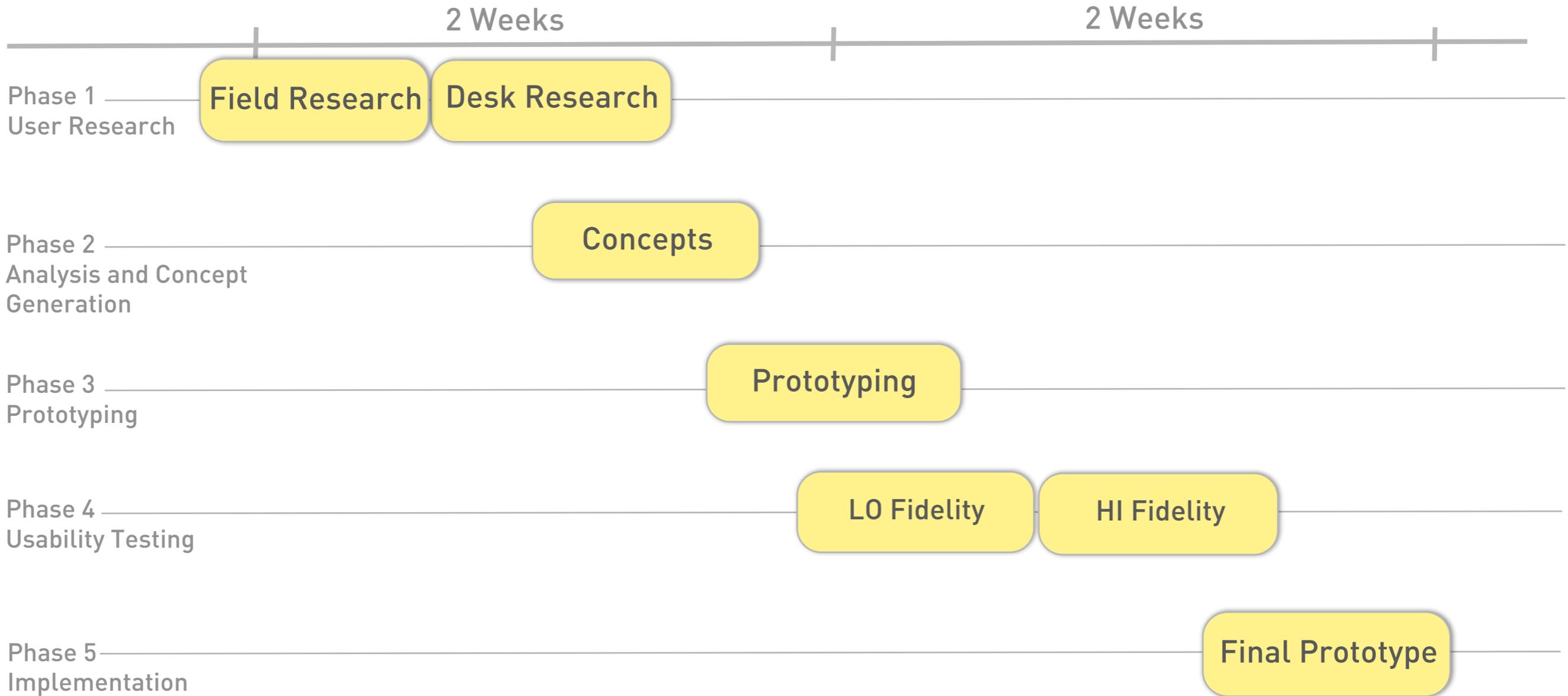
- Intro & Designprocess Phase
- Values and Levels of Prototyping
- UX Prototyping Techniques
- Prototyping Case Study



Some Examples  
from a school  
called  
**Copenhagen  
Institute of  
Interaction  
Design  
(CIID)**



Some Examples  
from a school  
called  
**Copenhagen  
Institute of  
Interaction  
Design  
(CIID)**





- SOCIAL NETWORKING
- OTTIUM™
- SCREEN WALL
- E-MAIL - TO - LETTER
- SKYPE-TV
- FAMILY FRAME + POLAROID
- ELDERLY AS RESOURCE (~~SCREENPHONE~~)
- GREEN HOUSE (PET HOME?)
- TIME MACHINE
- STORYTELLING DEVICE
- MEMORY-TRIVIA

ELDERLY EXPERIENCE

CONVINCING THE ELDERLY  
KNOWLEDGE OF THE ELDERLY  
THE ELDERLY CAN BE A  
SOURCE OF KNOWLEDGE

CHANGING ORDER

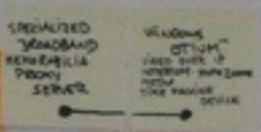
NANNY

EXCURSIONS

WALKING

PHOTOGRAPHY

UI  
- interface  
and portal  
for the  
elderly



TV channels  
elderly  
focus  
OTTIUM  
PROF

Control  
Level to user  
1-8-00

RFD  
SHRETLER



MEMORIES  
- Experience  
- Trivia  
- Contact

ELDERLY  
RECALLING  
OLD MEMORIES

enable  
storytelling

See through  
walls/see  
what's behind

Screen wall  
included  
Camera  
& speaker

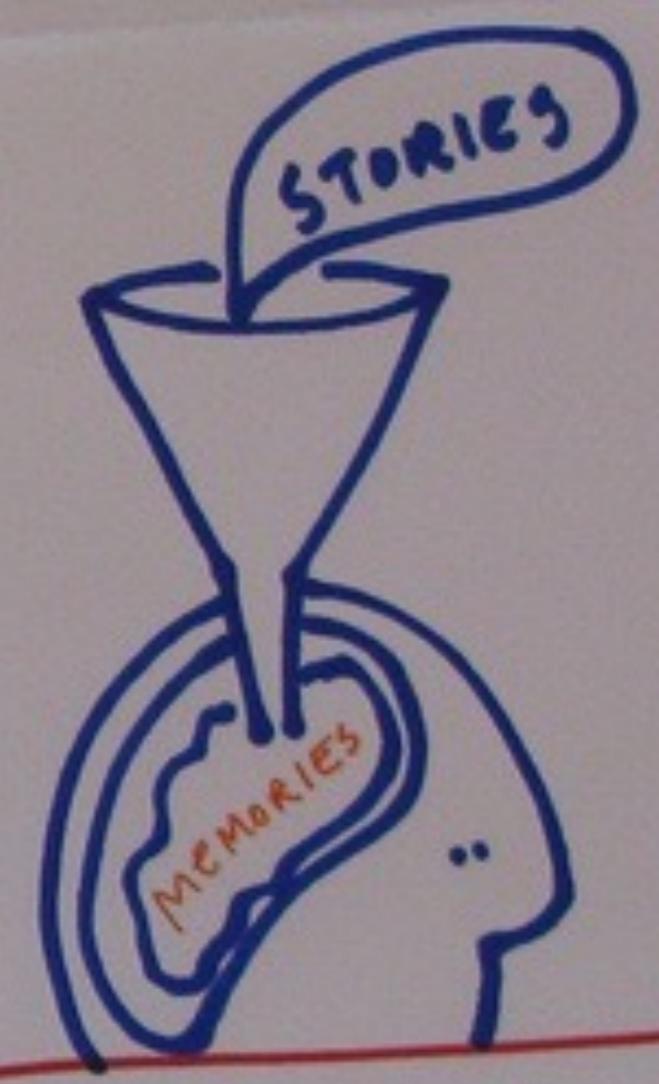
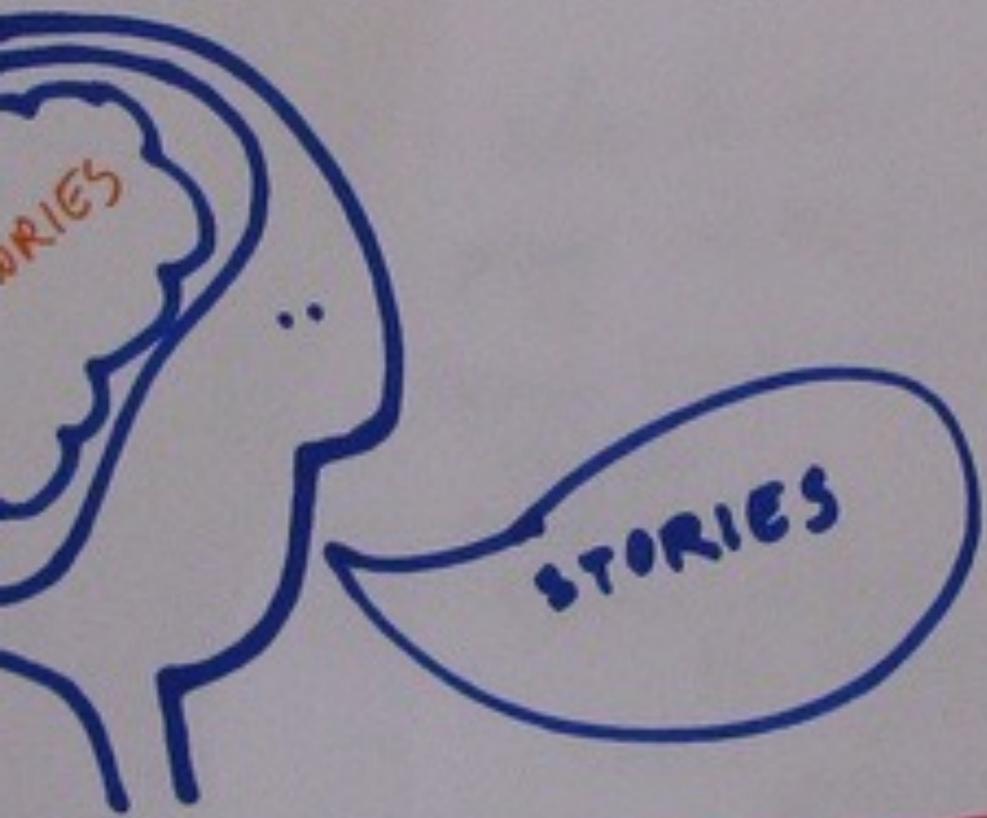
changing  
walls  
(walls turn  
into streets)

WIRE  
POLAROID

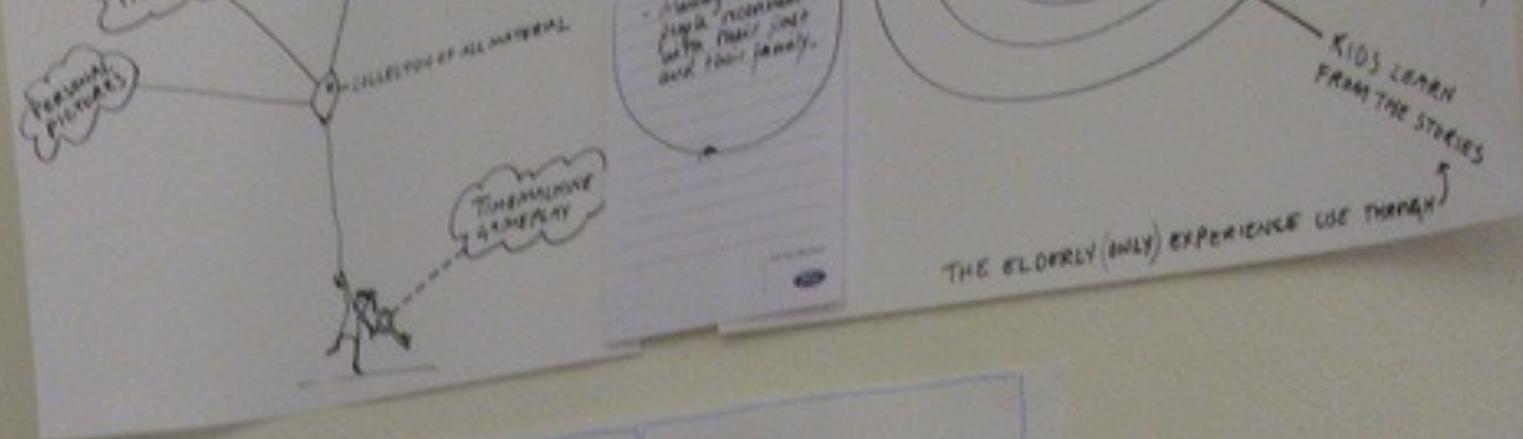
SKYPE-TV

PICTURE  
FRAME  
1 OBJECT





↳ Social studies!



**THE TIME MACHINE**

NO  
NO POTTER

1. The character enters the machine.

2. The character is inside the machine.

3. The character is being pulled into the machine.

4. The character is inside the machine, looking out.

5. The character is inside the machine, looking out.

**THE VIDEO GAME**

What if, in a game with  
telling the stories in  
it don't on the ground for  
you to be sure that they  
are not what is true.

What if the video game is the way  
to get the stories with  
to play the game is to  
the way that the game  
is to play the game  
to play the game  
to play the game

What if the video game is the way  
to get the stories with  
to play the game is to  
the way that the game  
is to play the game  
to play the game  
to play the game

What if the video game is the way  
to get the stories with  
to play the game is to  
the way that the game  
is to play the game  
to play the game  
to play the game

1. The character enters the machine.

2. The character is inside the machine.

3. The character is being pulled into the machine.

4. The character is inside the machine, looking out.

5. The character is inside the machine, looking out.

6. The character is inside the machine, looking out.

7. The character is inside the machine, looking out.

8. The character is inside the machine, looking out.

9. The character is inside the machine, looking out.

10. The character is inside the machine, looking out.

What if the video game is the way  
to get the stories with  
to play the game is to  
the way that the game  
is to play the game  
to play the game  
to play the game

**TIME MACHINE**

THE KIDS CAN TRAVEL IN TIME

**THE ELDERLY**

SOLVING RIDDLE IN GAME

**SPIN FOR REWARDS TO BRACK WITH**

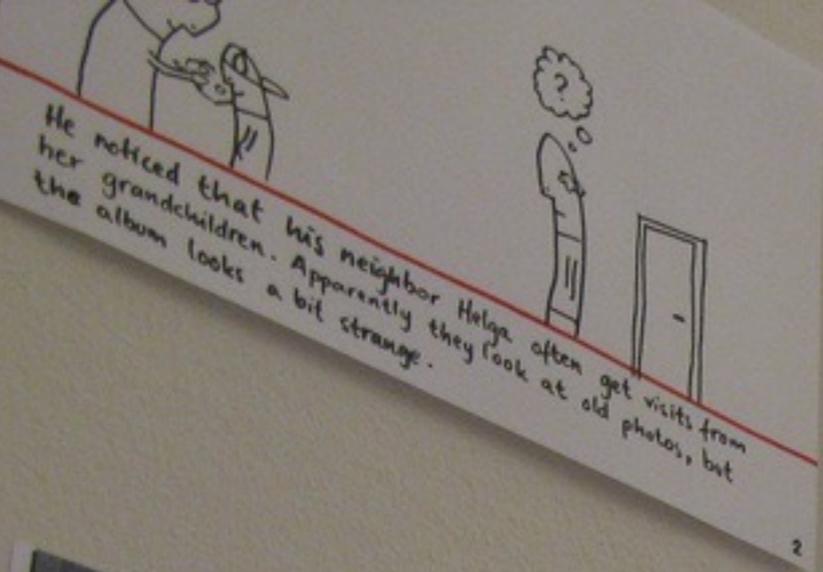
THE DEV  
AND IS  
PANTON  
EIGHTY  
THREE  
LOCAL  
A SOLID  
TECHNI  
A-INT  
SIC

CON  
KNOW  
THE  
INT  
THRO  
GIVE  
OF  
WILL  
LEA  
TO

FR  
ELEPH



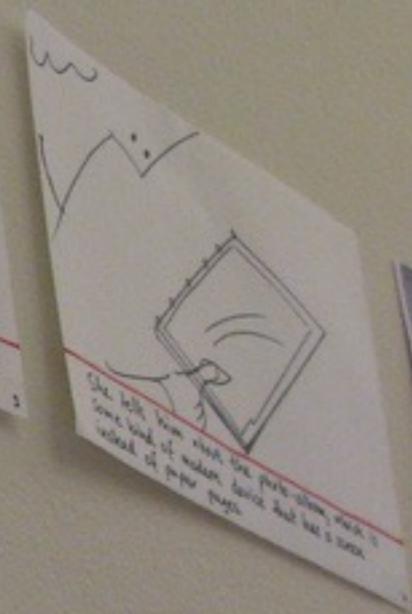
... as  
... a bit



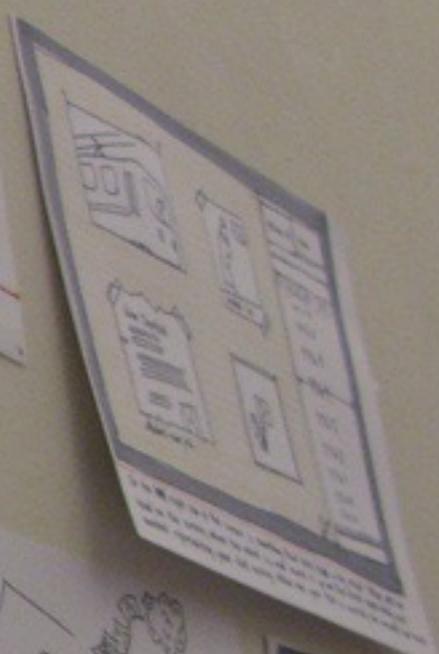
1 He noticed that his neighbor Helga often get visits from her grandchildren. Apparently they look at old photos, but the album looks a bit strange.



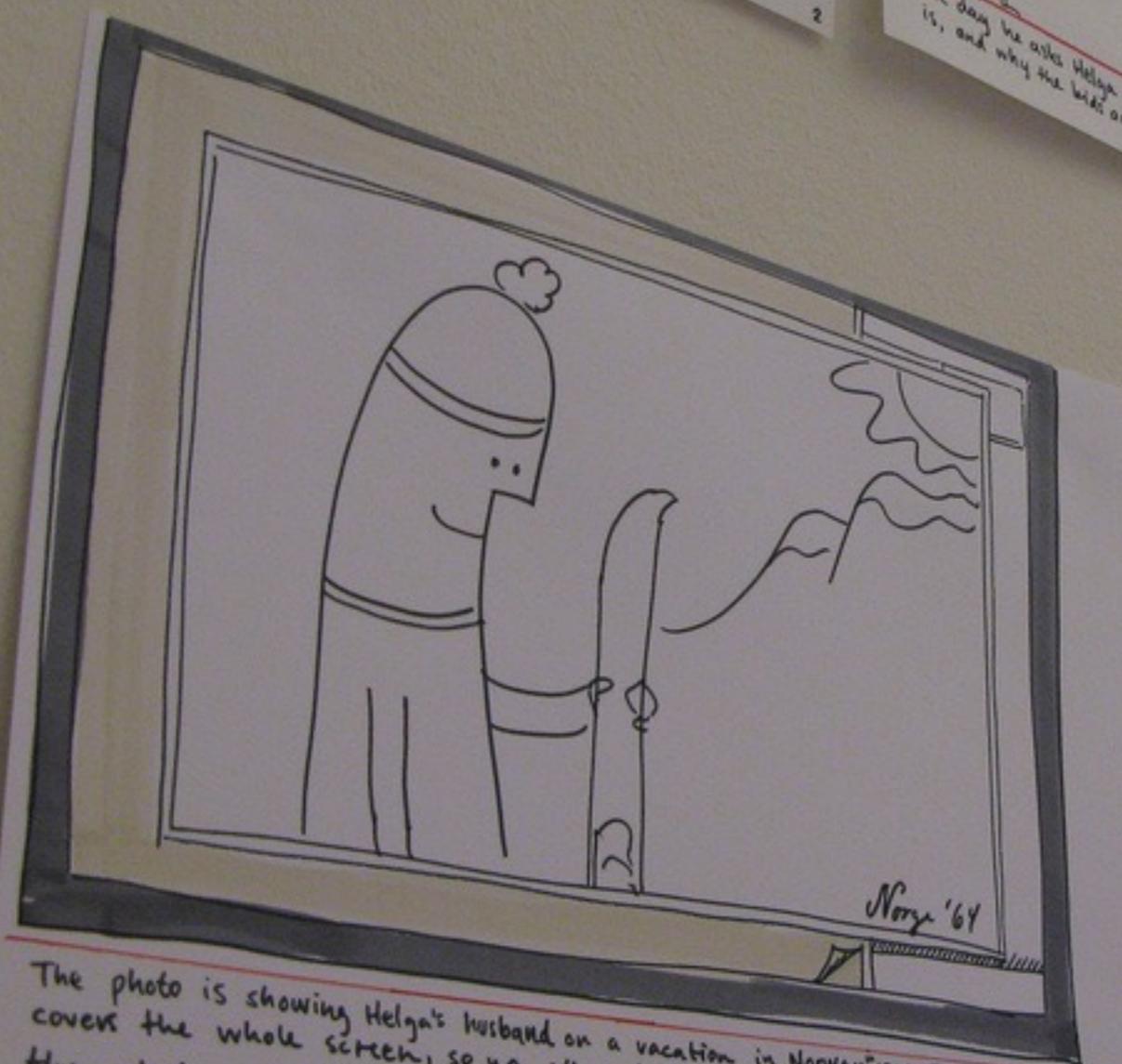
2 One day he asks Helga what kind of photo-album it is, and why the kids are so interested in it.



3 She tells him about the photo-album, which is some kind of modern device that has a screen instead of paper pages.



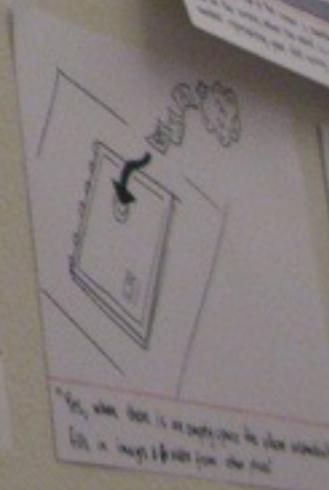
4 The photo album is a special kind of photo album. It has a screen that shows the photos. You can touch the screen to see the photos. It is very modern and interesting.



5 The photo is showing Helga's husband on a vacation in Norway 1964. The photo covers the whole screen, so no other buttons can be pressed. She touches the photo again, and it shrinks to its original size.



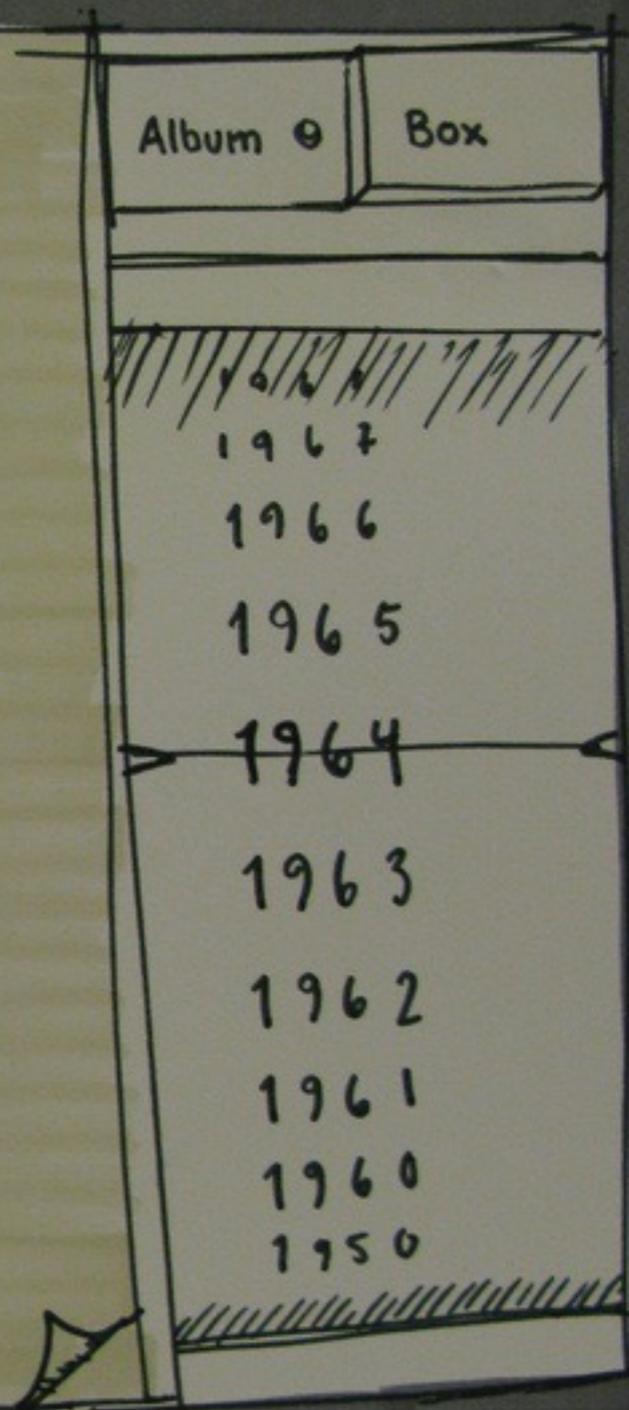
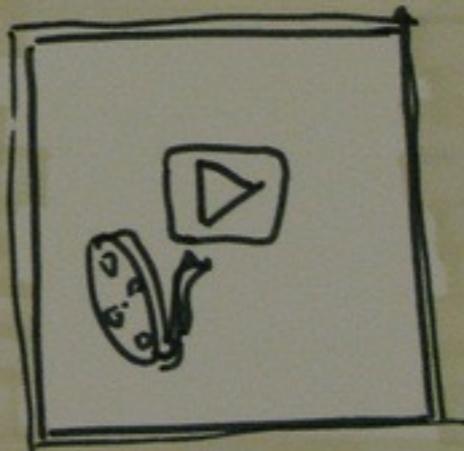
6 "So you have personal photos in it? But wait, didn't I also see a photo from Pölviken in there?" Albert asked.



7 "Yes, when there is no picture on the screen, you can touch the screen to see the photos. It is very modern and interesting.



8 The photo album is a special kind of photo album. It has a screen that shows the photos. You can touch the screen to see the photos. It is very modern and interesting.

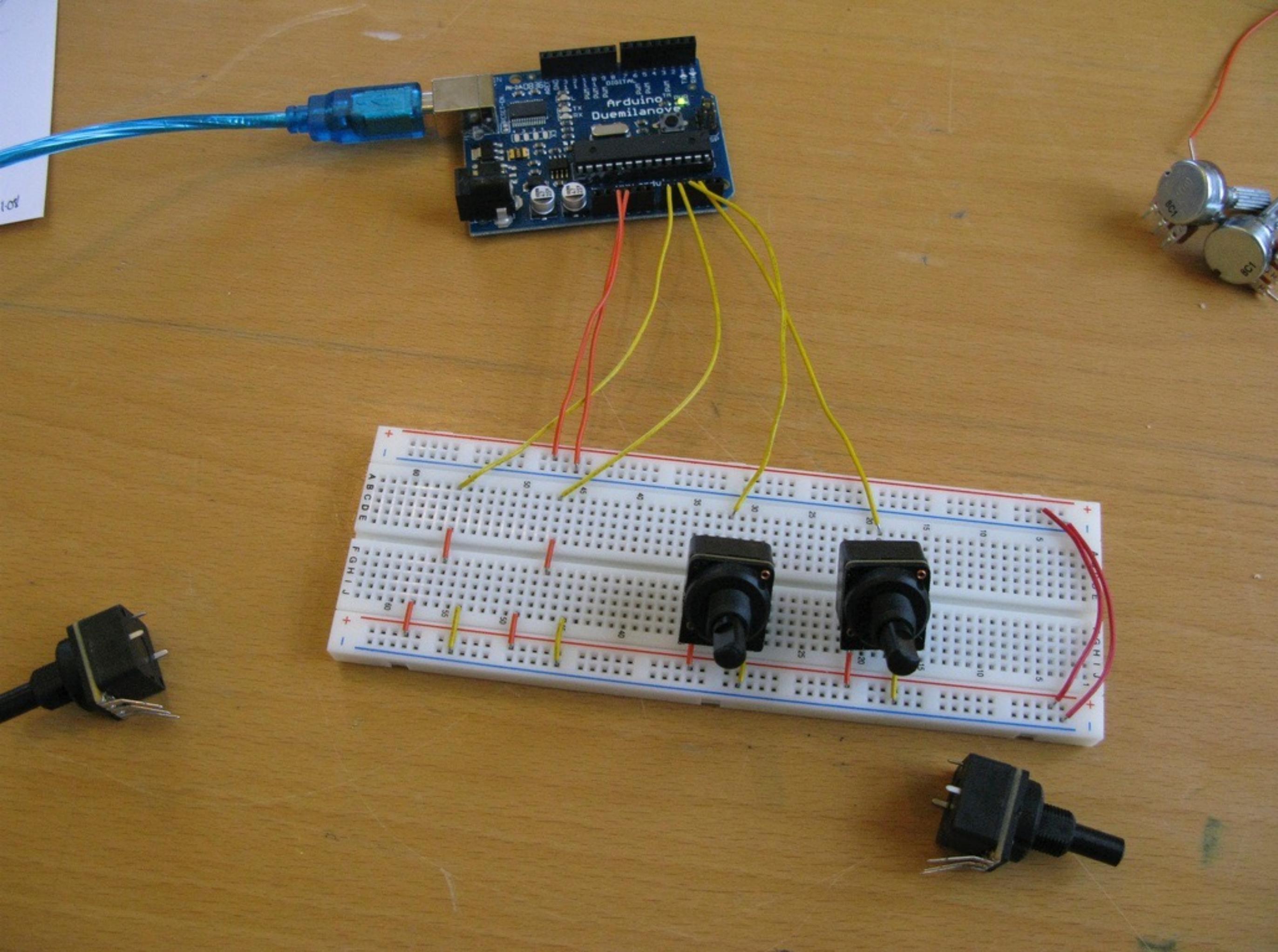


On the ~~left~~ right side of the screen is something that looks like a big wheel. Helga puts her hand on the screen, where the wheel is, and moves it up. The wheel starts rolling and numbers representing years start moving. When the year 1964 is centered, she removes her hand.











Viseaften  
Journalistforeningen  
1968, Music

1965

1970

15

Favorites





Viseaften

Journalistforeningen

1968, Music

198

Favorites

De



OH!  
WHAT A LOVELY WAR

What a lovely war  
Glenn Gauer  
1978, Radio Theater

1975 1980 19 Favorites DC

**Thanks** for your attention !

## References (books)

### **Bill moggridge: designing interactions**

Publisher: The MIT Press; 1 edition (October 1, 2007)

ISBN-10: 0262134748

### **Bill buxton: sketching the user experience**

Publisher: Morgan Kaufmann (March 30, 2007)

ISBN-10: 0123740371

### **Don norman: the design of everyday things**

Publisher: Basic Books (September 17, 2002)

ISBN-10: 0465067107

### **Kevin mullet: designing visual interfaces**

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