

# User Experience Design I (Interaction Design)

Day 6 - (17.12.2020 9-12 a.m.)

Prototyping User Experiences

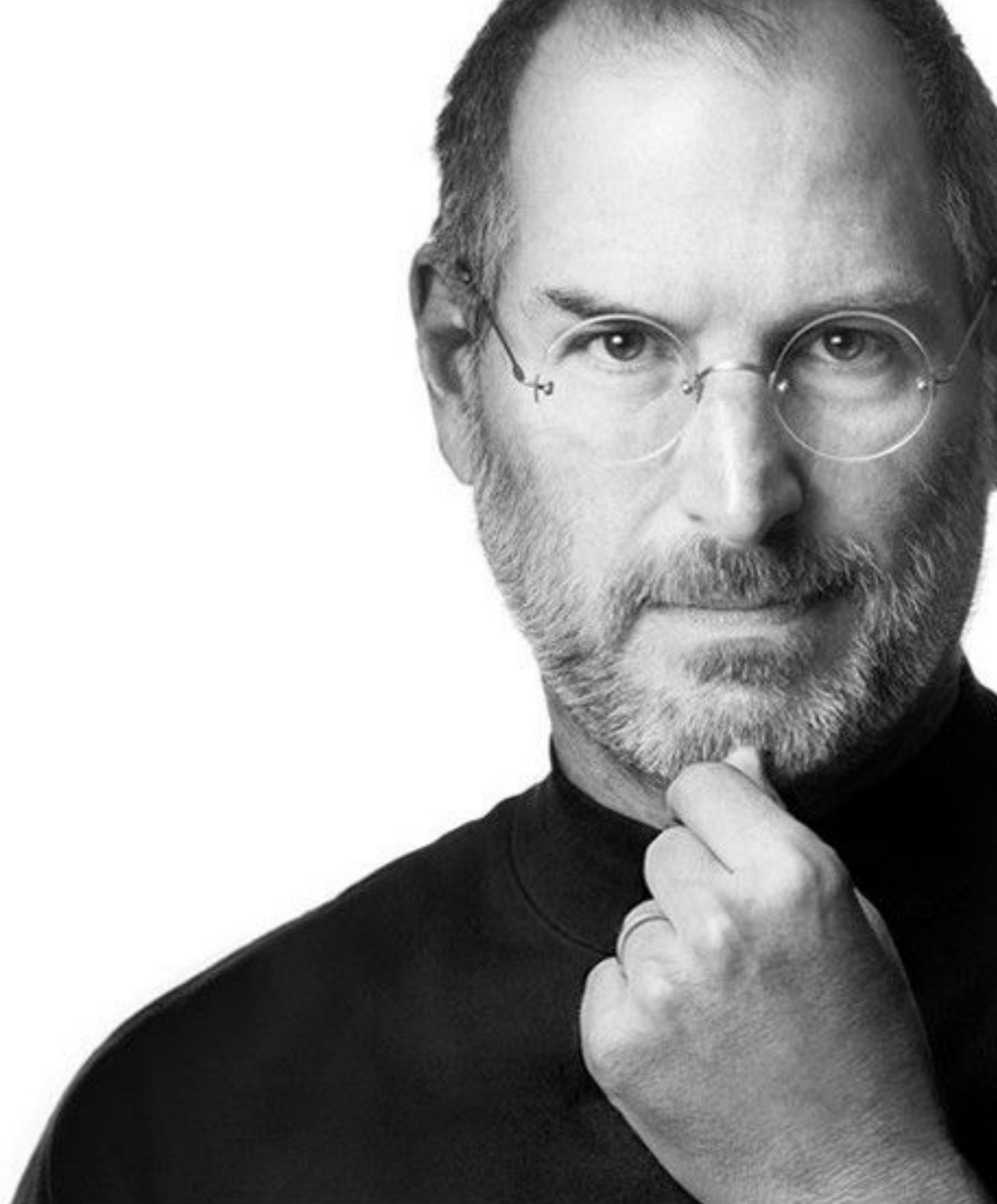
- Prototyping Values and Dimensions
- Low vs. High Fidelity
- Sketching-in-Hardware
- Video-Prototyping

# Prototyping User Experiences

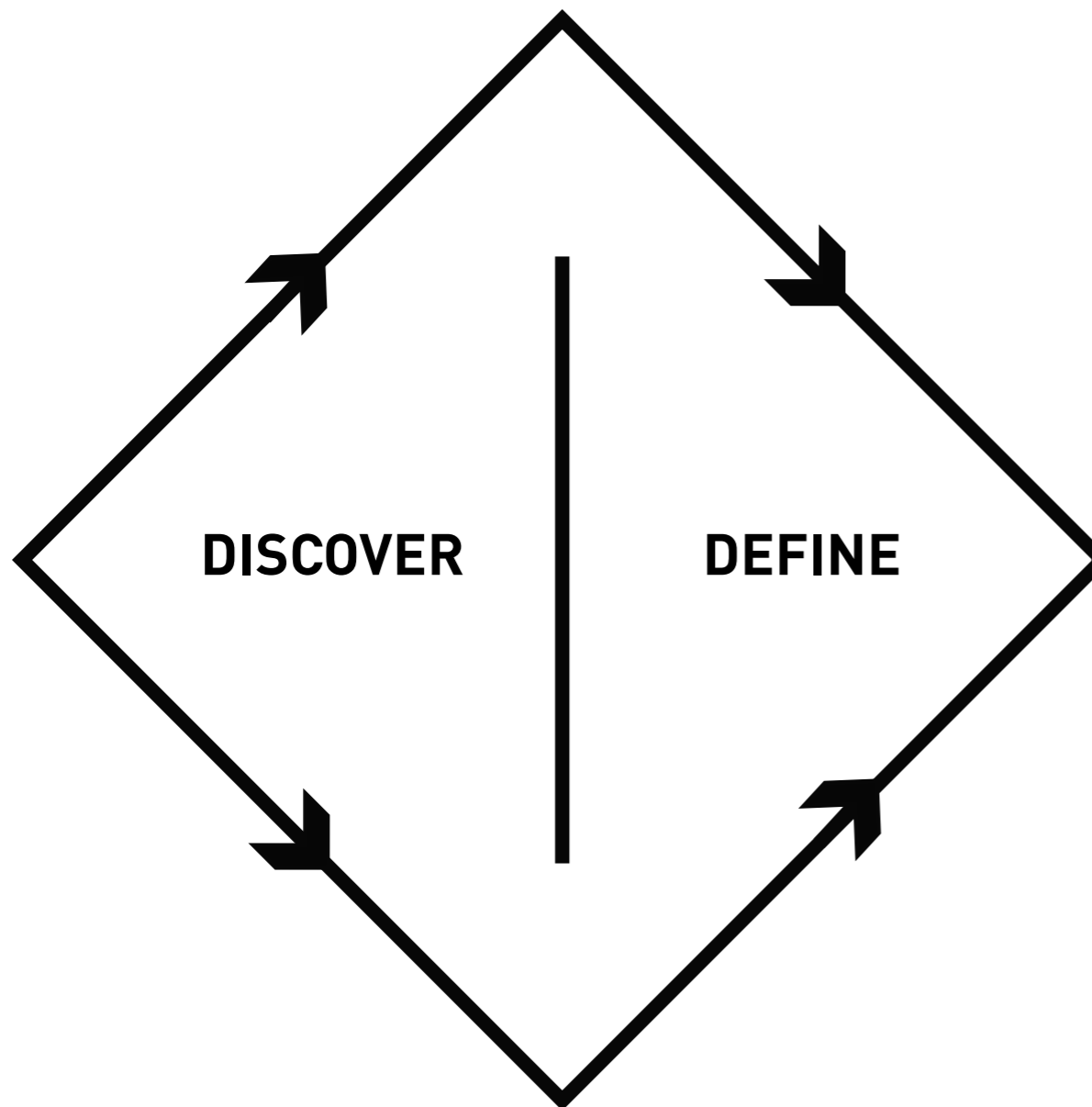
- Prototyping values and dimensions
- Examples: Physical Experience Prototypes
- UX Video Prototyping

“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**



# Double Diamond



## DEFINE STAGE

- The generation of initial ideas and project development
- Ongoing project management
- Corporate objectives agreed and project sign-off

At the Define stage, a combination of the ideas or directions identified during the Discover stage are analysed and synthesised into a brief with actionable tasks related to new and existing product or service development. The Define stage ends with a clear definition of the problem(s) and a plan for how to address this through a design-led product or service. In practice, the Define stage ends in a project go-ahead through corporate level sign-off.

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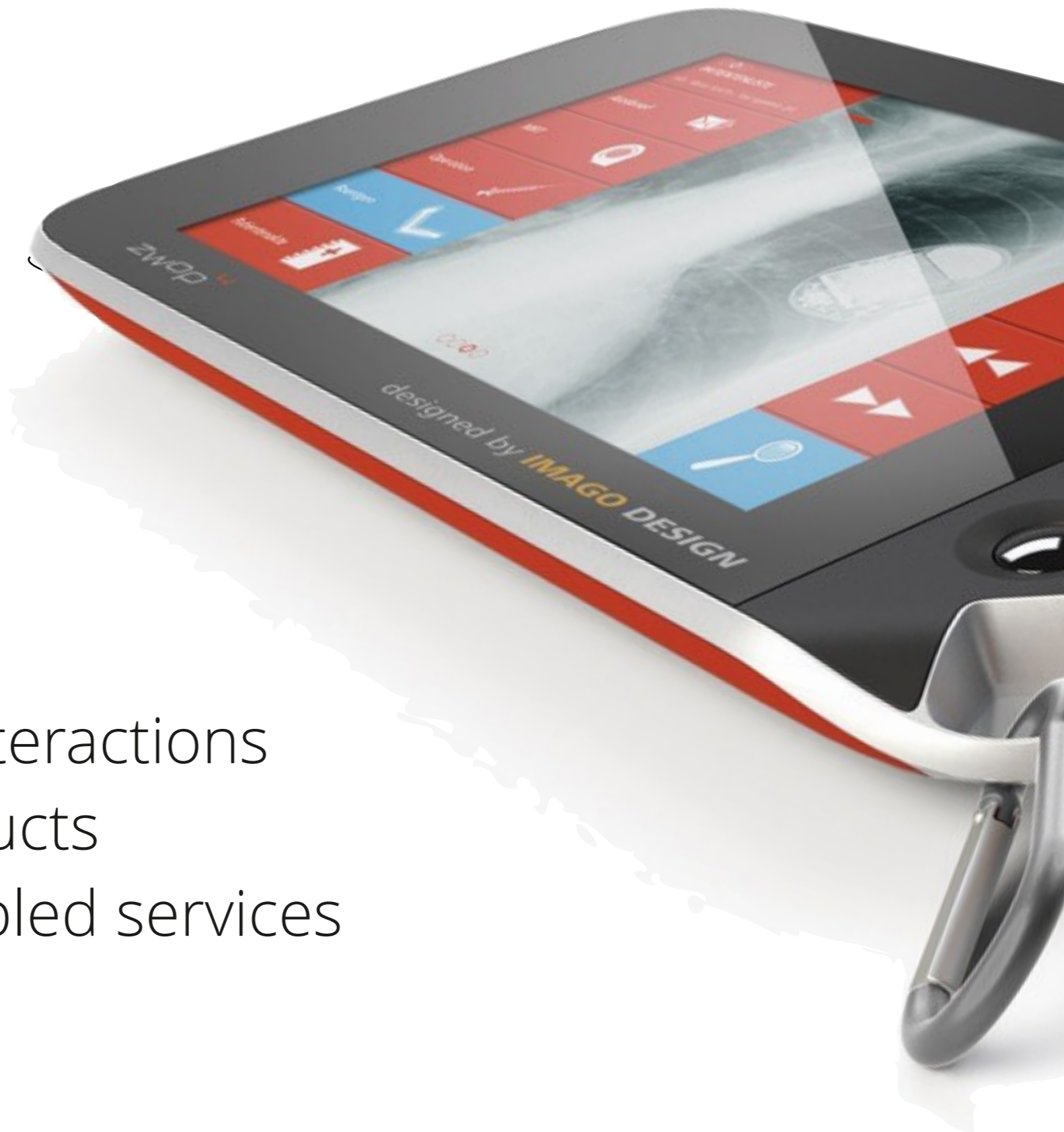
An original type, form, or instance that serves as a model on which later stages are based and judged.

## American Heritage Dictionary



Three main design contexts in the UX domain which can be expressed through prototypes:

- 1.) Screen based interactions
- 2.) Interactive products
- 3.) Technology enabled services



Creating  
Experience  
Prototypes  
during the design  
process pursues  
different goals:

- 1.) Exploring a context / research
- 2.) Examining design problems / testing
- 3.) Evaluating solutions / presentation



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In summary:

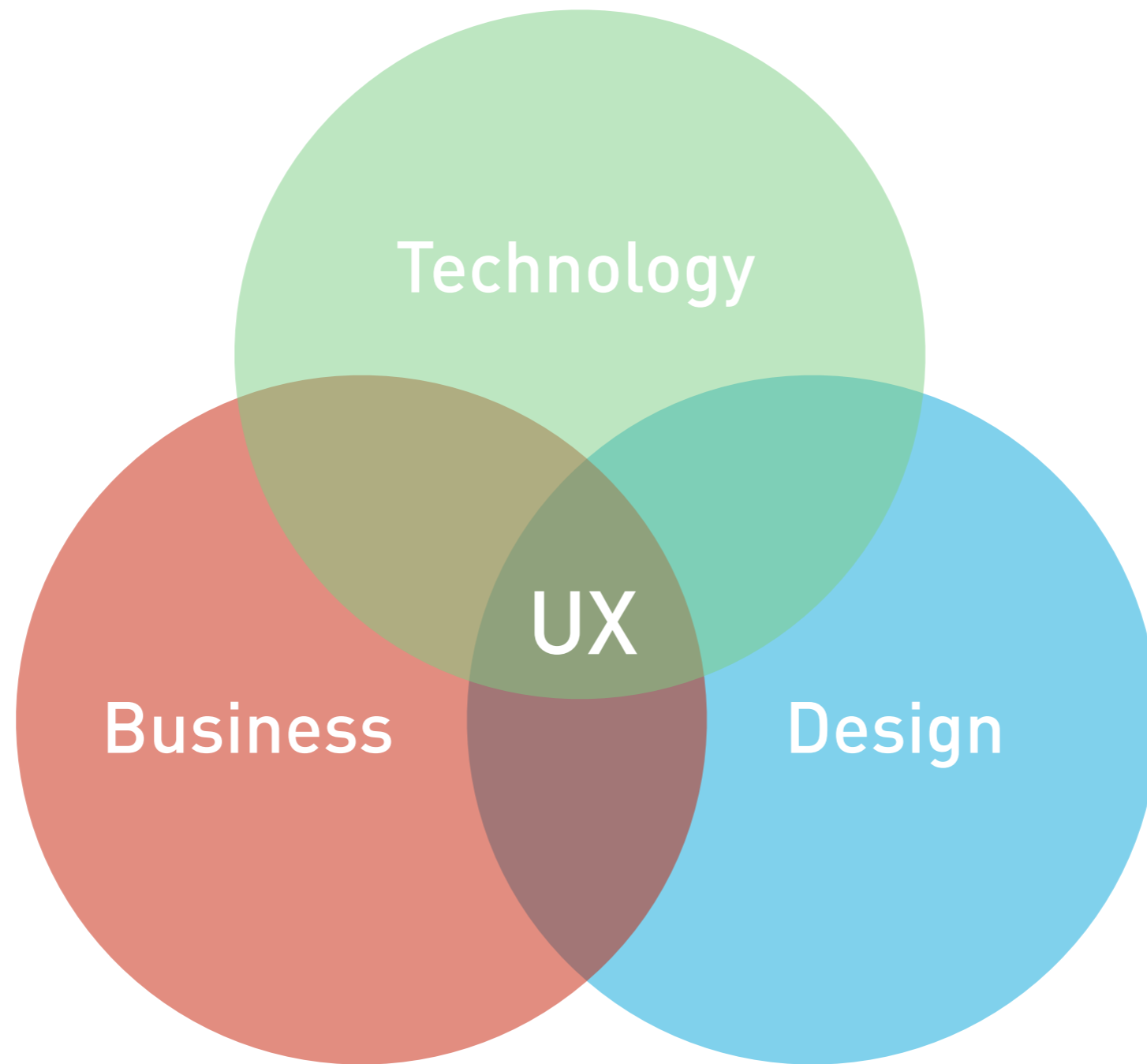
Prototypes are **design-thinking enablers** deeply embedded and immersed in UX design practice.

Prototypes are **learning and discovery tools** for generating and refining UX design ideas.



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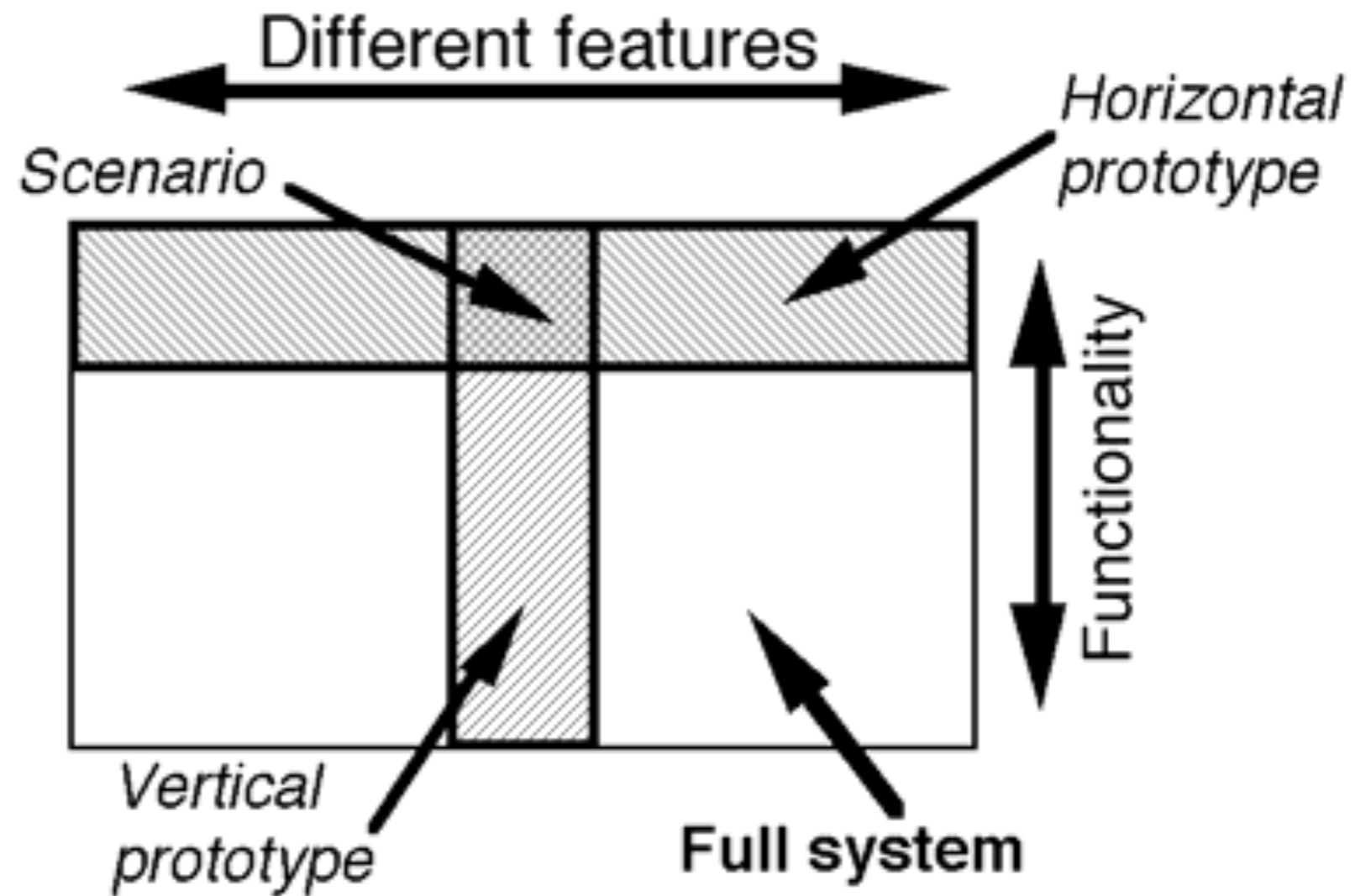




A principle for setting priorities: users will use 20% of the features of your product 80% of the time. Focus the majority of your design and development effort (80%) on the most important 20% of the product.



# Horizontal vs, Vertical Prototypes



80/20 rule

role

**For the Designer:**

Exploration  
Visualisation  
Feasibly  
Inspiration  
Collaboration

look 'n' feel

**For the End User:**

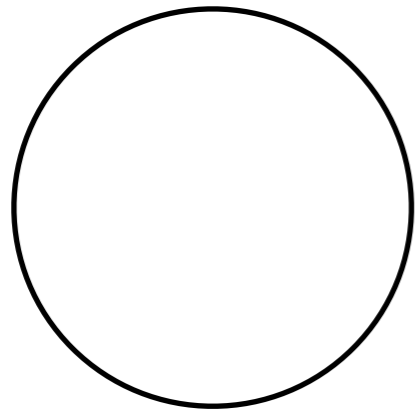
Effectiveness / Usefulness  
A change of viewpoint  
Usability  
Desirability

implementation

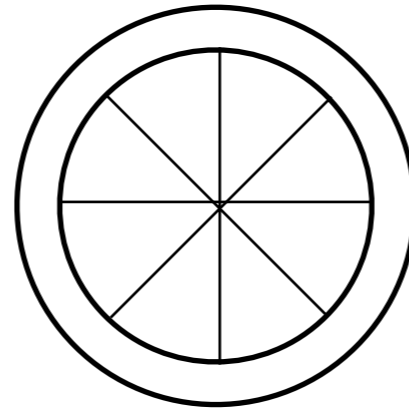
**For the Producer:**

Conviction  
Specification  
Benchmarking

# Fidelity v. Resolution



low resolution  
low fidelity



high resolution  
low fidelity



high resolution  
high fidelity

**resolution = amount of detail**

**fidelity = closeness to the eventual design (product/service)**

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

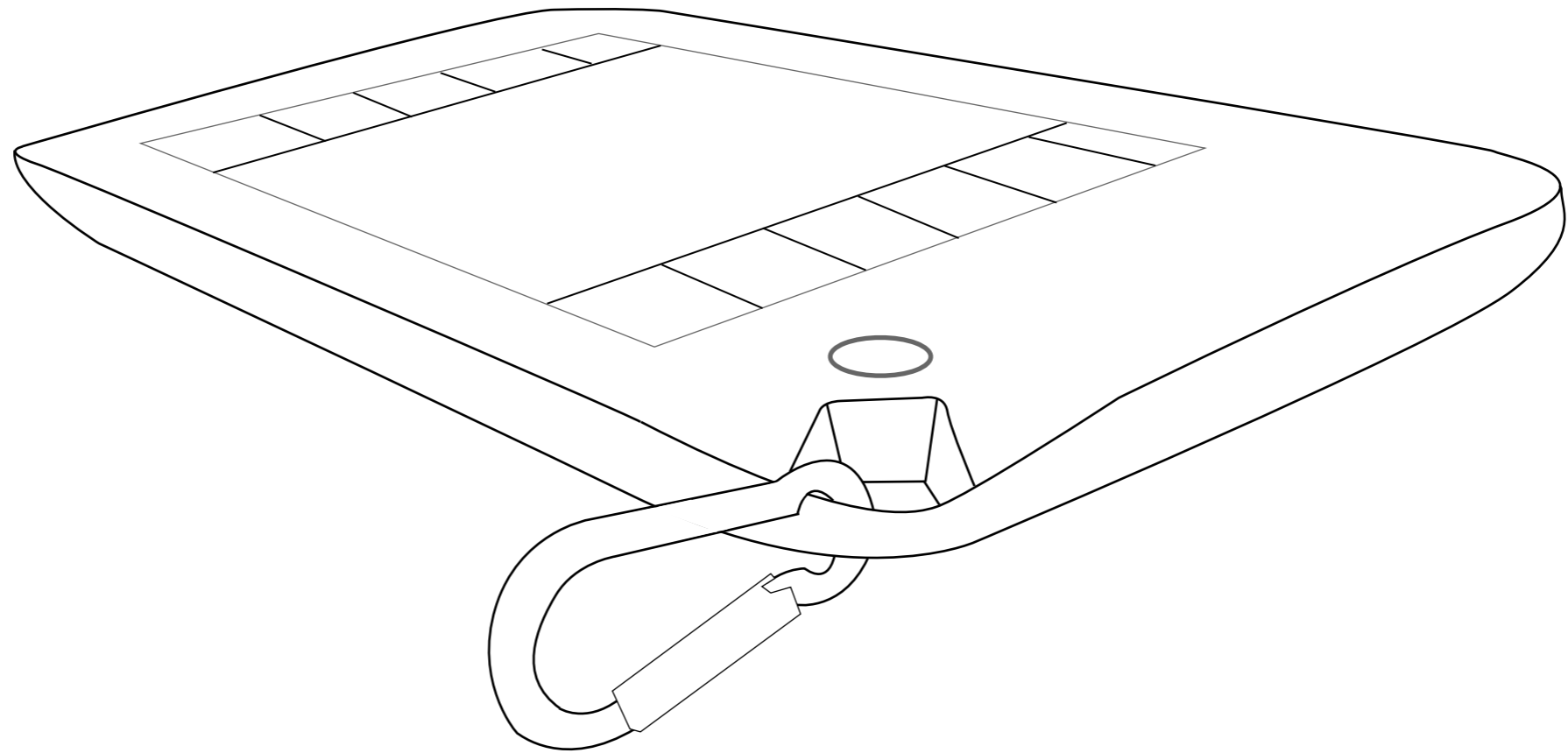
Early Validation

Concrete Ideas

# Prototyping User Experiences from scratch

- Sketches and Wireframes
- Paper Prototypes
- Storyboards

1st Iteration  
low-res/low-fi





# Prototyping User Experiences from scratch

- Design drafts and mock-ups
- Functional prototypes
- 3D Printing

4th Iteration  
high-res/high-fi







Thermistor



Bend Sensor



PIR Sensor



Force Sensor



Potentiometer



Magnet Switch



Distance IR Sensor

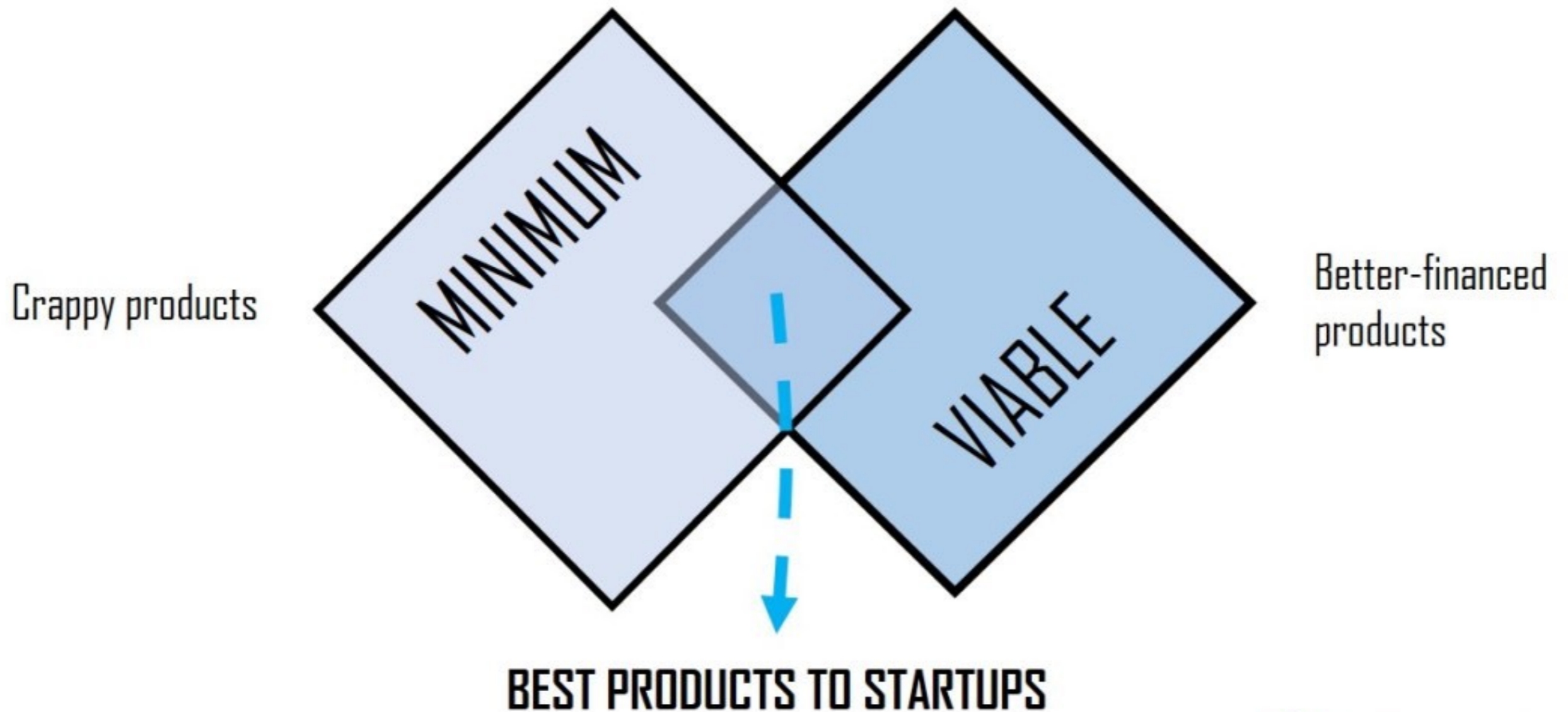


Touch QT Sensor



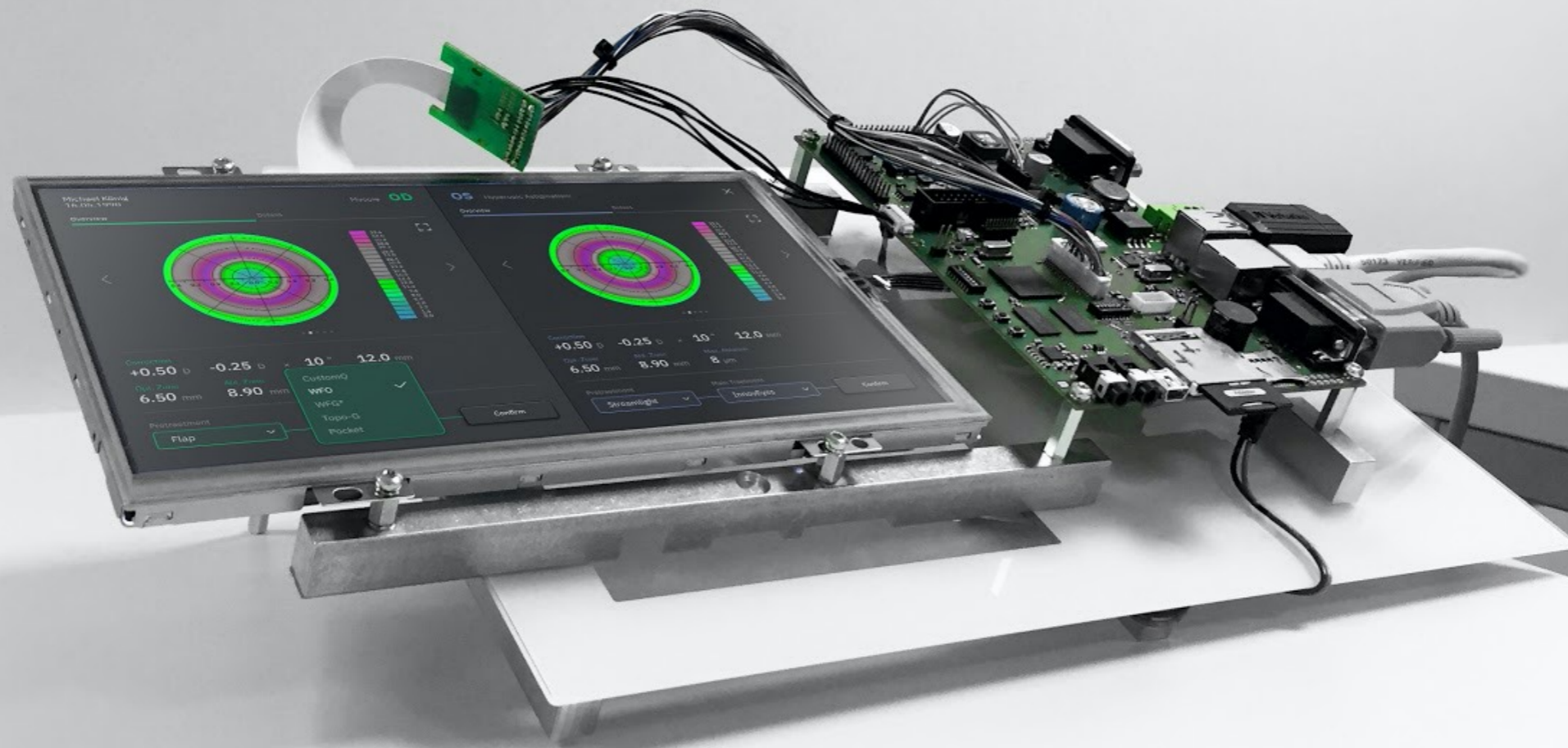
Ultrasound Sensor

# MINIMUM VIABLE PRODUCT



# Prototyping User Experiences for products using

- Embedded Platforms
- Off-the-shelf-components
- Customised hardware



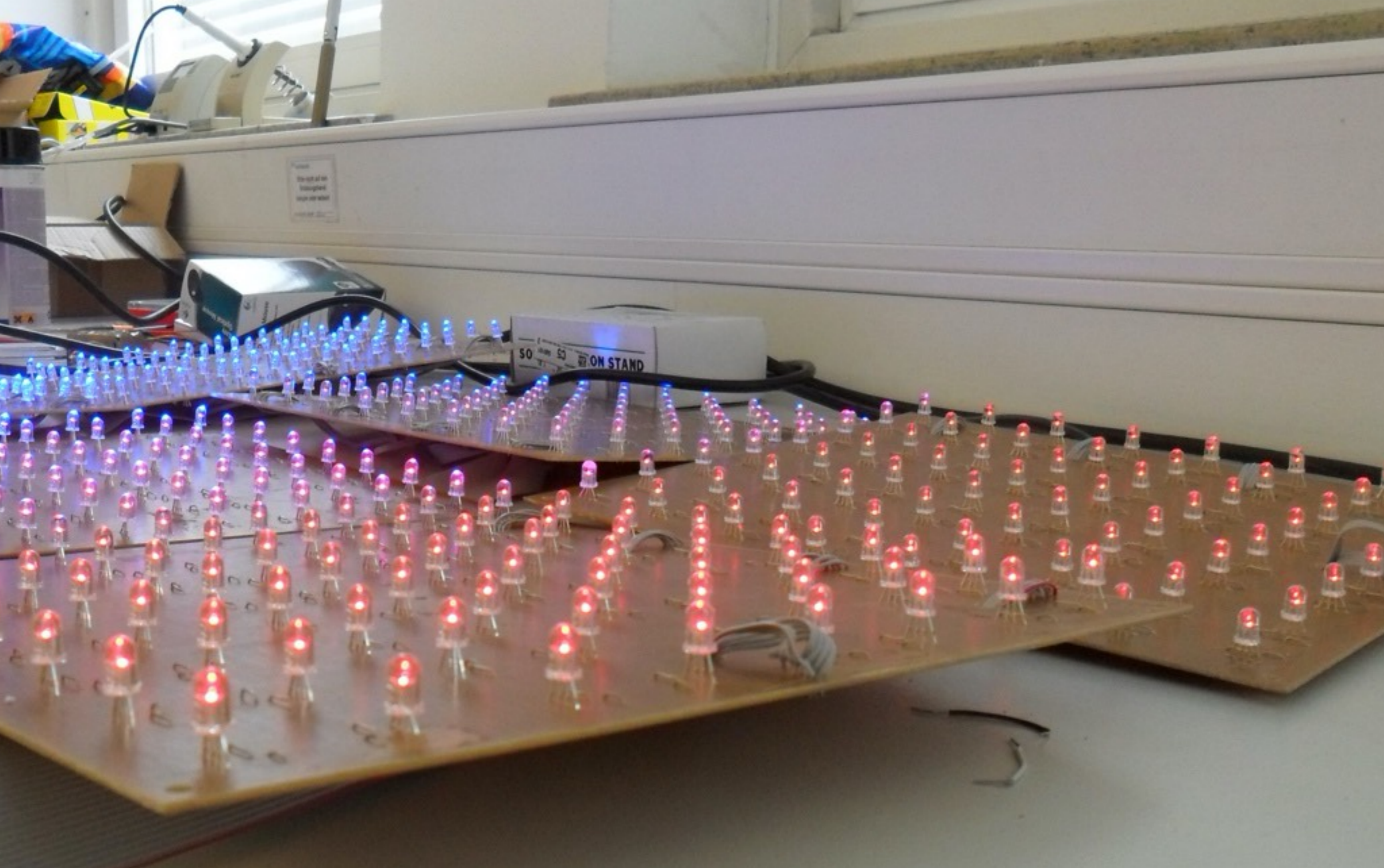
# Prototyping User Experiences

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# Design Workshop II



# Design Workshop II



...to Prototype!

# Design Workshop II

In conjunction with B/S/H (Neff)  
Home Appliances

- 12 MA Media Informatics Students
- Duration: One semester
- Topic: Tactile Feedback



# Prototypes



# Prototypes



# Prototypes





# **Design Workshop II**

## **In conjunction with Acelik**

### **Home Appliances**

- 16 MA Industrial Design Students
- 14 MA Human-Computer Interaction Students
- Duration: One semester



# Reminding Water Dispenser



# Pure Air



# Dirt Buster



# Recipe Printer



HoverMeasure

# Prototyping User Experiences

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# “Why prototype with video?”

Representing complex relationships, new behaviours and attitudes are an integral part of UX design. These can be represented through many means including sketching and making physical prototypes. However, capturing a journey **over time** requires a linear medium like video.





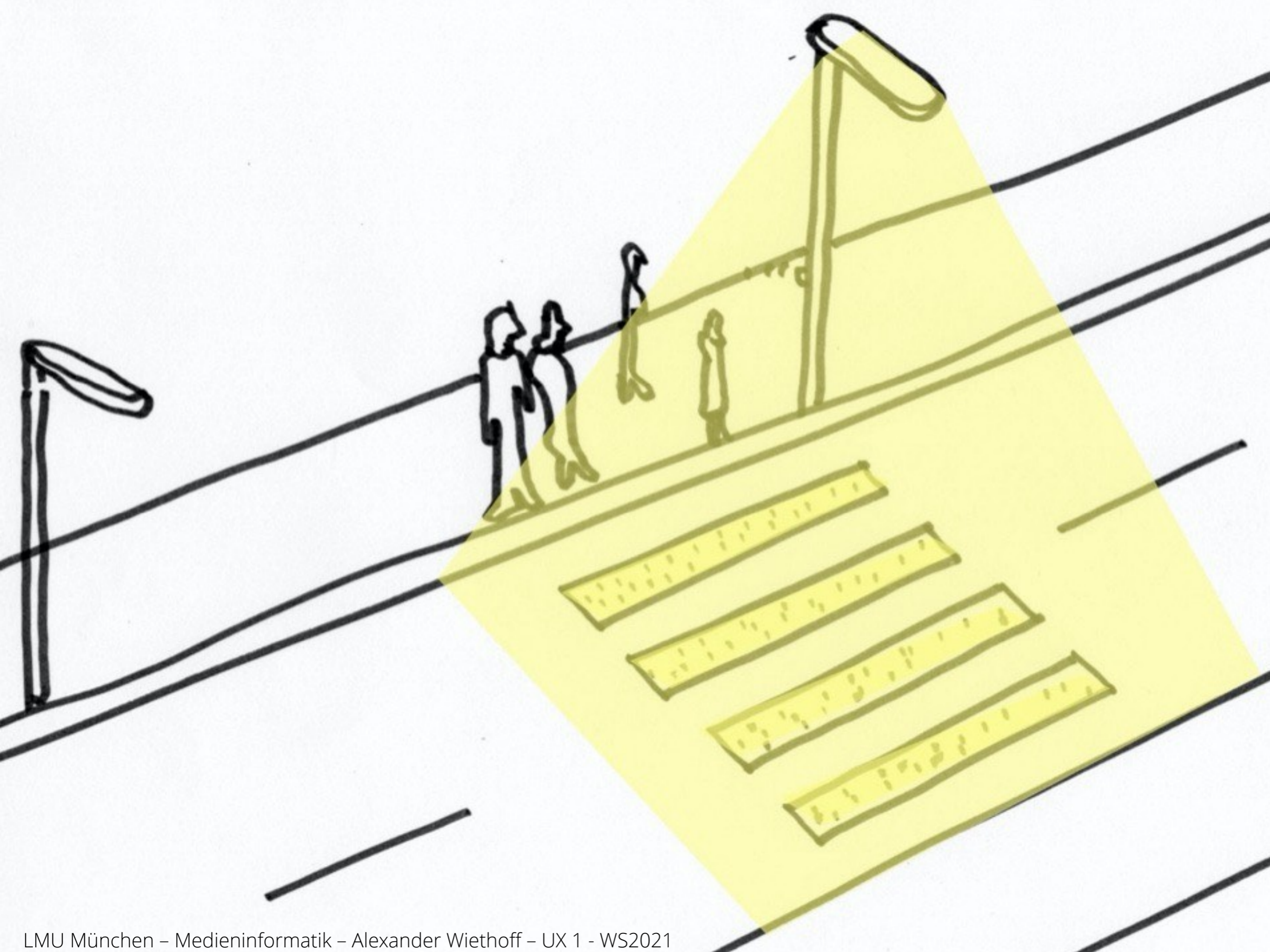
# “Just enough Prototyping”

Understand your audience and choose the right level of resolution and fidelity. Judge the time and resources available. Go for the easiest and **simplest track**, don't overdo you prototype for a given context.



# Example

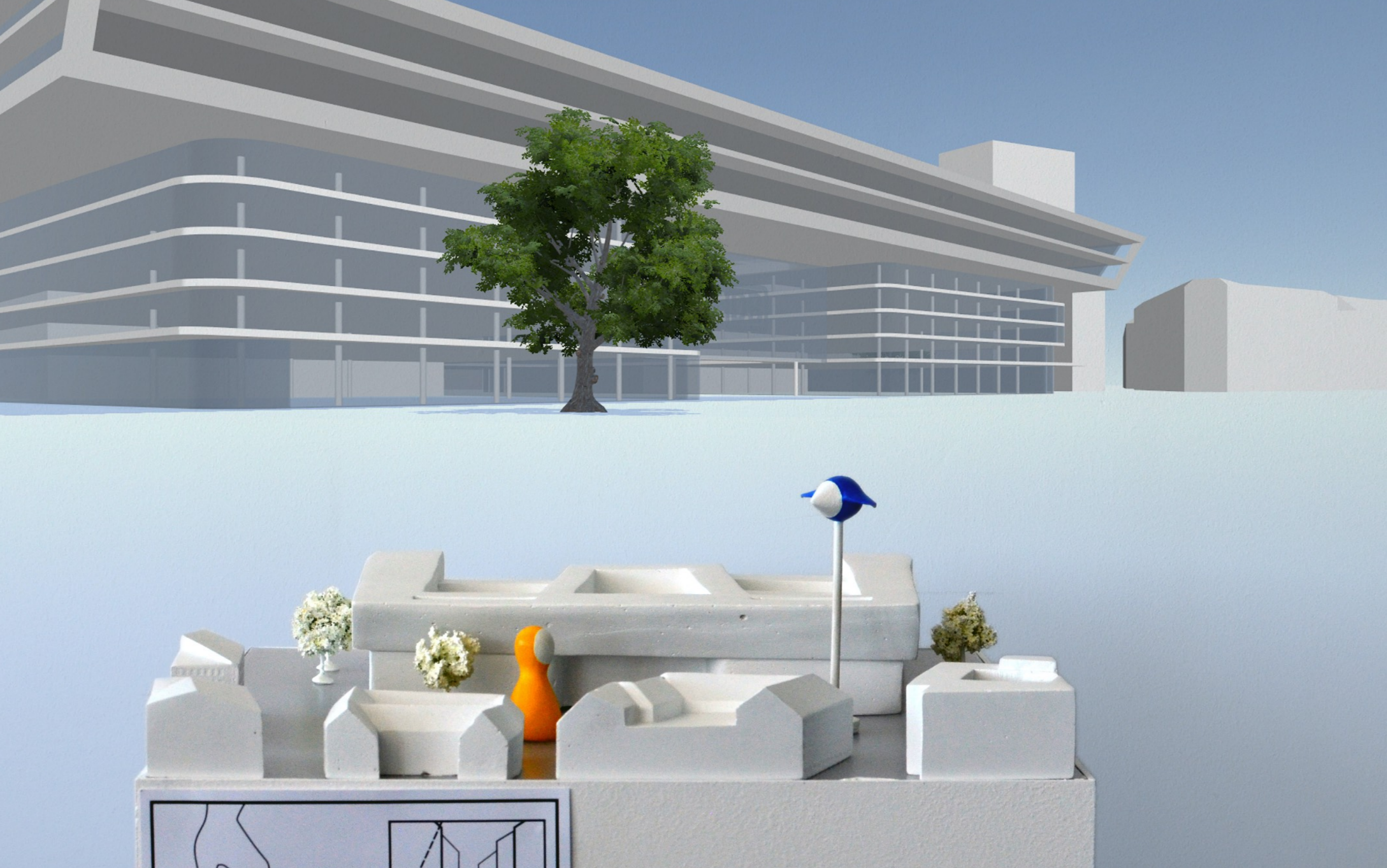
low resolution  
high fidelity  
(crossing on demand)



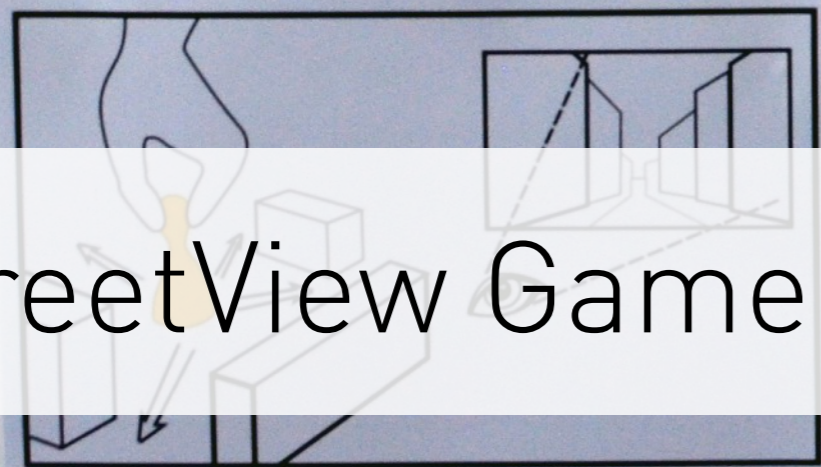


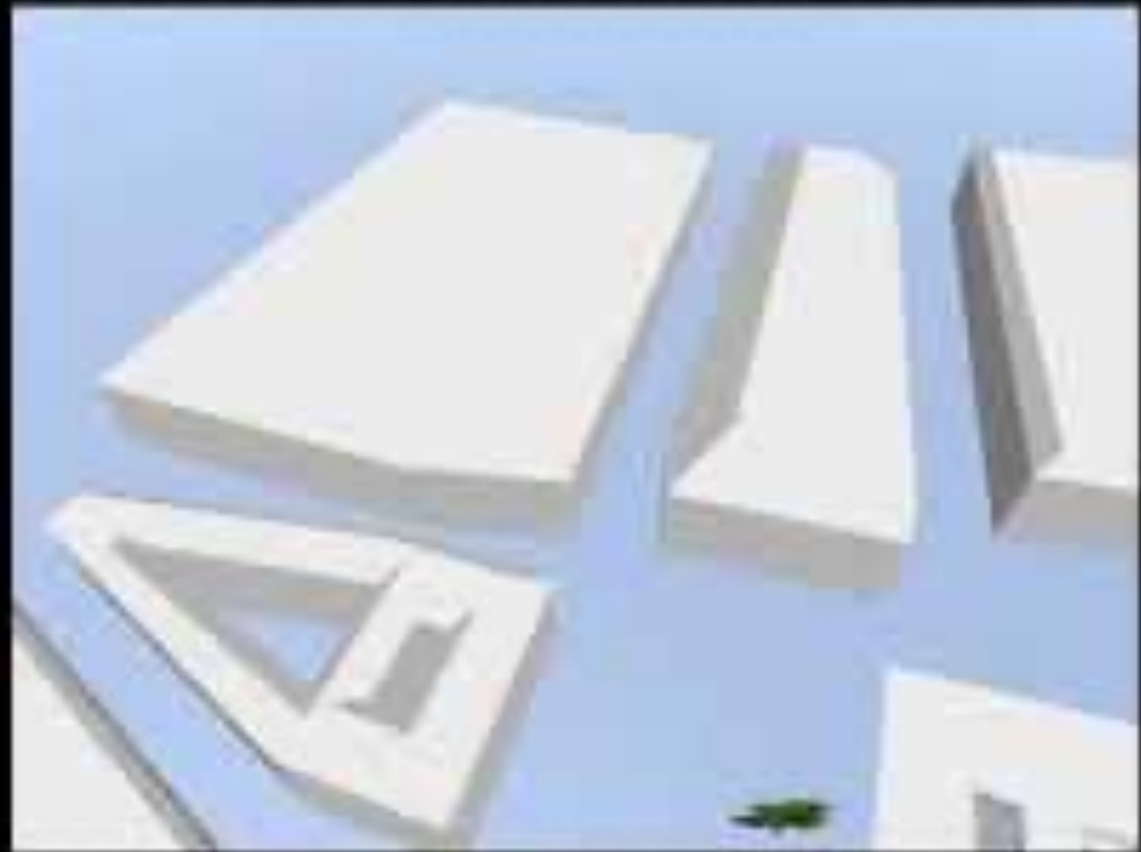
# The Smoke & Mirror Approach





StreetView Game





StreetView Game

# Tutorials

## Keyboard Hacking Tutorials

<http://www.instructables.com/id/Hacking-a-USB-Keyboard/>

## Physical Computing Intro

<https://itp.nyu.edu/physcomp/>

## Arduino Tutorials

<https://www.arduino.cc/en/Tutorial/HomePage>

## Physical Computing w. Raspberry PI

<https://www.raspberrypi.org/learning/physical-computing-with-python/>

## Adafruit Hacking Tutorials

<https://learn.adafruit.com/>



# References:

- [1] Moggridge B: Designing interactions. *The MIT Press* 2005
- [2] Buxton, W.: Sketching the user experience. *Morgan Kaufmann* 2007
- [3] Norman, D.: The design of everyday things. *Basic Books* 2002
- [4] Mullet, K. Designing visual interfaces. *Prentice Hall PTR* 1994
- [5] Houde, S., & Hill, C. What do prototypes prototype? *Handbook of HCI* 1995
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- [7] Lidwell, W. et. al Universal principles of design, Rockport Publishers. 2010
- [8] Buchenau et. al. Experience prototyping. *Proceedings of DIS* 2005
- [9] Gerber et. al. The psychological experience of prototyping. *Design Studies* 2012