**HCI Bootcamp**
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web:  https://ex-situ.lri.fr/workshops/hci-bootcamp-2018

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**Tuesday**

Review:
- Web searches
- Video Brainstorming

Class exercises:
- Ex #10  Design space
- Ex #12  Design concept
- Ex #13  Alternatives
- Ex #14  Interaction Table
- Ex #15  Diagram
- Ex #16  Design scenario
- Ex #17  Storyboard #1

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**Generative Design**

<table>
<thead>
<tr>
<th>Discovery</th>
<th>Who is the user?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Invention</td>
<td>What is possible?</td>
</tr>
<tr>
<td>Design</td>
<td>What should it be?</td>
</tr>
<tr>
<td>Evaluation</td>
<td>Does it work?</td>
</tr>
</tbody>
</table>

**Invention**

Websearch
Invention
Video
Brainstorming

Invention
Design
Space

**Design Space**

- Gather ideas relevant to your design problem:
  - some are your own brainstormed ideas
  - some are from others, e.g., your web search

- Extract different design dimensions that characterize the ideas

- Place the ideas along the design dimensions
  - at least three ideas per dimension
  - generate new ideas if you find gaps
  - explore the intersections of different dimensions

- Select a subset of dimensions and ideas to create a design space

**Exercise: Design space**

- Identify the key ideas

- Categorize the ideas into design dimensions

- Place the ideas along the design dimensions
  - 3 or more ideas per dimension
  - generate new ideas if you find gaps
  - explore the intersections of different dimensions

- Create a design space to explore:
  - Choose interesting dimensions and ideas
Design space: Communication Apps

Design Space: Octopocus

Design space: Octopocus

Generative Design
Design
What should it be?

Design requires **choices**

- Prototypes help express specific concepts at different levels of representation
- **Goal:** quality, not quantity of ideas

**Careful:** Each choice limits options but also poses new questions and may suggest new possibilities

**Prototyping interaction**

- **Design scenario**
  Imagine the system from the user’s perspective
- **Video Prototype**
  Illustrate the use of the system in context
  “sketch” dynamic, interactive user experiences
- **Wizard of Oz**
  Simulate the system live
  with a human operator “behind the curtain”
- **Simulation**
  Create a working subset of the system

**What is a prototype?**

- **Prototype =**
  concrete representation of an interactive system

**Characteristics**

- Representation:
  form of prototype
  sketches - simulations
- Precision:
  level of detail
  informal - complete
- Interactivity:
  interaction
  watch - interact
- Evolution:
  lifecycle of prototype
  throw out - iterative

The choice of prototype depends upon the design phase and the specific needs of the designers
Prototyping helps the designer …

- Consider different design alternatives
- Ensure usability under diverse conditions
- Help users and other stakeholders imagine the interface
- Focus on problematic parts of the interface

Representation

- Paper ‘take away’ prototypes
  - Easy and fast to create
  - Most useful at the beginning of the design process
  - Examples: sketch storyboard sequences, screen mockups, video prototypes

- On-line prototypes
  - Use the computer, longer to create, more polished
  - More appropriate later in the design process
  - Examples: animations, interactive videos, scripting languages, interface builders

Precision

- Low fidelity (lofi) prototypes with little detail
  - Great for rapid exploration of ideas
  - Example: paper sketches, SILK

- High fidelity (hifi) prototypes, very detailed
  - Good to communicate specific design considerations
  - Example: dialog box with layout alternatives

Note: A detailed representation is not always precise
  (You can omit elements that have not been decided)

Details

- A system can be good in theory
  - but unusable in practice
  - Because of flaws in the interface … even small ones

- Good prototypes let designers work with different sets of details at the same time

- Good prototypes allow users to envision the final system: but also to feel comfortable suggesting changes
Level of Interactivity

<table>
<thead>
<tr>
<th>Non-interactive</th>
<th>Fixed</th>
</tr>
</thead>
<tbody>
<tr>
<td>No interaction, but can show potential interaction</td>
<td></td>
</tr>
<tr>
<td>Example: a video clip showing user interacting with a device</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Low interaction</th>
<th>Pre-determined path</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can test several alternative forms of interaction</td>
<td></td>
</tr>
<tr>
<td>Example: designer shows a screen shot, user indicates her action, the designer shows the result</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>High interaction</th>
<th>Open</th>
</tr>
</thead>
<tbody>
<tr>
<td>Users interacts with the system, with some limitations</td>
<td></td>
</tr>
<tr>
<td>Example: Wizard of Oz or computer-based simulation</td>
<td></td>
</tr>
</tbody>
</table>

Wizard of Oz

Technique for prototyping novel user interfaces

Wizard of Oz:
Designer ‘plays computer’ to create an interactive experience for the user
Useful for creating video prototypes but also for creating live experiences that rapidly explore different design alternatives

Evolution

Rapid prototypes: Early exploration of diverse alternatives
Easy to create, check, throw away afterwards
Example: paper prototype or interface like SILK

Iterative prototypes: create individual modules
Create successively more refined versions
Example: series of prototypes, successively more detailed

Evolving prototypes: may become the final product
Different completed sections are successively added
Example: a software module has functionality added before being added to the final system

Prototyping strategies

Horizontal:
Complete one layer of functionality at a time
Example: develop the details of the interface without a working database

Vertical:
Complete functionality of part of the system
Example: develop the spelling checker first

Task:
Create functionality necessary for a single task
Example: develop the interface for adding and editing an image

Scenario:
Create functionality needed to run a scenario
Example: develop the functions needed to edit three images and spell-check a document within a design scenario

Video supports every phase of design

**Evaluation:** Users try new system
- Interaction patterns
- Use scenarios

**Observation:** Users in context
- Design principles
- Interaction techniques

**Prototyping:** Design possibilities
- Brainstorming: Explore new ideas

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**How do you find the design concept?**

- Based on your studies of users, choose a problem to solve specific to your audience.
- Generate a variety of ideas that offer potential solutions.
- Create a design space to embody the set of alternatives.
- Choose a design concept to explore focus on interaction, not just functionality.

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**Creating a concept**

- Identify a real, specific problem.
  - Real problems tend to be complex and messy
  - Look for a small, simple aspect of a real problem
  - Rather than a stereotypical 'toy' problem
- Trade-off between power and simplicity:
  - Less is More
- Be curious, be creative, seek surprises and new opportunities.
### Describe the design concept

- How will the user be able to do?
  - What are the objects of interest?
  - How will users interact with them?
  - What can the system do?
  - How will the user learn it?

- content
- interaction
- function
- discovery

### Iterate the design concept

- Apply the concept to the user scenario:
  - How will a user interact with the objects of interest to perform which functions, in a real-world setting?

- Consider:
  - Does the system respond to real user needs?
  - Is it specific enough to specify a design?
  - Is it technically possible?

- Describe the concept in one sentence

### Avoid Analysis Paralysis

**CHOOSE SOMETHING!!**

The first idea is NEVER complete or right or “good”

- ALWAYS reevaluate, redesign, and refine

### Exercise: Design concept

- Describe the design concept
  - One-sentence description

- What user problem(s) does it solve?
  - Is the interaction clear?
  - What technology does it use?
  - How does it help users?
Exercise: Design alternatives

Don’t stop with your first design concept … but don’t explore 50 ideas either!

Carefully consider 3-5 alternatives

Focus on alternative forms of interaction, not different functionality

Button presses and pull-down menus encourage procedural, annoying interfaces
You can do better!

Design
Design
Alternatives

lunch!

Design
Design
Scenario
Using a Design Concept

Revisit the user profile and personas
Can you target the users better?

“Animate” the personas in the use scenario
How does applying the concept address their issues?
Can you push the limits to generate something new?

Create a design scenario
Revisit each interaction point in the scenario
Apply video brainstormed or new ideas
Create a storyboard and a video prototype
to illustrate the concept in context

Quick review: user-based design resources

1. Critical Interview stories
   Specific, real incidents where a user has a problem that illustrates an opportunity for design, organized into categories.

2. User profile
   High-level description of target user’s characteristics and needs

3. Personas (and extreme character)
   Specific, imagined people who have typical or extreme needs from the target user group identified in the user profile

4. Use Scenario
   Realistic description of a series of events and activities, based on key issues identified in the interviews, in which realistic people (personas) face problems in a realistic setting, that serve as the foundation for the design of a new interactive system.

Reminder: Use scenario

Like a tiny, branching one-act play,
sub-divided into one-paragraph micro scenes that describe a series of ‘interaction points’

Create one or more personas (characters), each with:
name, age, gender, motivation
usually with a profession, expertise
usually with a goal or motivation

Create one or more realistic setting(s):
date, time, place, context

Identify a series of events over a period of time
From use to design scenarios

Tell a story that illustrates how one or more people interact with technology in a real-world setting.

Use scenario:
- Draws from real-world observation of people who face challenges that a new technology might address.

Design scenario:
- Builds upon current scenarios and speculates how these people would interact with new technology, in this setting.
- Change the use scenario if it helps you explore alternatives.

Tip: Choosing character names

Make names short, ideally one syllable.

Either alphabetize them:
- Ann, Bob, Chuck, Dave, Eli

Or link names to functions:
- Pat is a patient.
- Sue is a surgeon.

Design scenarios ≠ Concept scenarios

Design scenarios
- Help interaction designers explore possibilities
- Value: realism, grounded, challenges ideas

Contrast with:

Concept and marketing videos
- Help ‘sell’ the concept
- Value: idealized use, market potential

Scenarios: What to do

Create a theme … and variations to explore alternatives.

Balance both ‘normal’ and unusual situations, especially breakdowns and errors. (… and normal is rarely normal)

Consider external events that affect interaction as well as motivated action by the user.

Include patterns of interaction over time, including repetitions and wasted effort.

Highlight surprises.
Scenarios: What NOT to do

Avoid ‘over-selling’ the technology
    Explore options rather than one solution
Avoid irrelevant detail
    Focus on interaction, not users’ personal lives
Avoid flowery description
    Stick to the facts
Avoid humor, at least for now
    Difficult to do well
    Often distracting

Exercise: Design scenario

Create a realistic description of the use in context of a new system

Procedure
    Start with the personas and the use scenario
    Decide how they will interact with your new system in a real context
    Tell the story, step by step

Design scenario format

| Title: | Event or technology being designed |
| Who?: | Characteristics: name, sex, age, profession, ... |
| What?: | Event that sparks the story |
| Where?: | Location |
| When?: | Date, time |
| Motivation: | Why is this happening? |
| Situation: | Relevant detail to aid understanding |

Design scenarios ➔ Video Prototypes

Design scenarios lead to storyboards which lead to video prototypes

Each provides a successively deeper way to think about situated interaction

Each should be considered highly iterative:
    Creating alternatives is cheap
    Use them to explore alternatives
    Don’t be afraid to try and reject ideas
Design scenarios ➔ Video Prototypes

Scenarios use words to describe situations
Create multiple paragraphs to explore options

Storyboard break up the action and illustrate it
forcing you to think more deeply about interaction
They take more time, so select options carefully

Video prototypes are dynamic sketches of interaction
Acting out the interaction
enhances thinking deeply,
remembering ideas
sharing with users, designers, management, stakeholders
deciding what to program or test

Storyboard

Goal
Illustrate the design scenario,
emphasizing the details of the interaction with the system
being designed

Procedure
Divide the design scenario into a series of interaction points
Create a series of images and text to illustrate each point

Storyboard

Borrowed from cinema to illustrate a scenario
Key images
Framing (shots)
Subtitles
Flow
Overview of the action
Key interaction points
Coherent order
Relevant details
### Storyboards

**Moment**
- Highlight what matters, omit the rest interaction points

**Frame**
- Sense of place, position & focus
- Start with overview, then show details
- Interstitutes, wide shots, close-ups

**Image**
- Evokes characters, objects, environments
- Focus on the user’s interaction
- Use simple special effects

**Words**
- Communicate ideas, voices
- Interstitutes (silent film)
- Voice-over (narrated), dialogue

**Flow**
- Guide reader
- Linear or branching

### Regular storyboard

- Identify key interaction points in the scenario
- Examine the key ideas from the design space (brainstormed ideas)
- Illustrate the interaction between user and novel system
- Describe key issues on the right

### Storyboard structure

- **Buena Vista CommApp**
- **System title**
- **User(s)**
- **Situation**
- **Establishing shot**
- **First interaction**
- **Closeup shot**
- **Second interaction**
- **Mid-range shot**
- **Third interaction**
- **Wide shot**
- **Fourth interaction**
- **Final credits**

### Video supports every phase of design

- **3. Design**: Video prototypes illustrating use in context
- **2. Brainstorming**: Video prototypes of design ideas illustrating interaction patterns
- **1. Observation**: Video clips of use scenarios