HCI Bootcamp

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

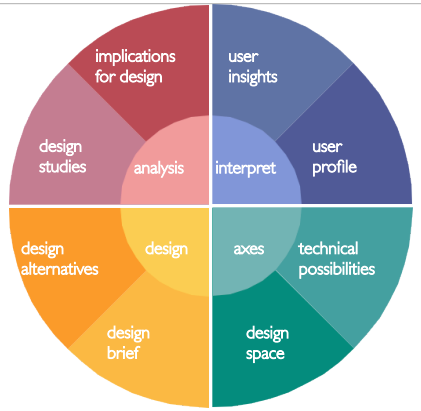
Generative Design

Discovery
Who is the user?

Invention
What is possible?

Design
What should it be?

Evaluation :
Does it work?



Tuesday

Review:
- Ex #9 Video Brainstorming
- Ex #10 Web searches

Class exercises:
- Ex #11 Design dimensions
- Ex #12 Design space
- Ex #13 Concept
- Ex #14 Alternatives
- Ex #15 Interaction Table
- Ex #16 Diagram
- Ex #17 Design scenario
- Ex #18 Storyboard #1

Goal: Create a Design Concept

Base your design concept on
- the user profile, grounded in your interviews

"Animate" your personas to
- walk through the use scenario
- push the limits with your personas / extreme characters

Create a design scenario
- choose your favorite video brainstormed ideas
- illustrate what happens at each interaction point
- create a sequence of events in the storyboard:
- shoot a video prototype to illustrate the concept in context

Invention

Design
Dimensions

Invention

Design
Space

Design Dimensions

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

Design Space

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

Place each idea where it fits on
- one or more design dimensions
  - at least three ideas per dimension
  - generate new ideas if you find gaps
  - explore the intersections of different dimensions

Exercise: Design dimensions & Design space

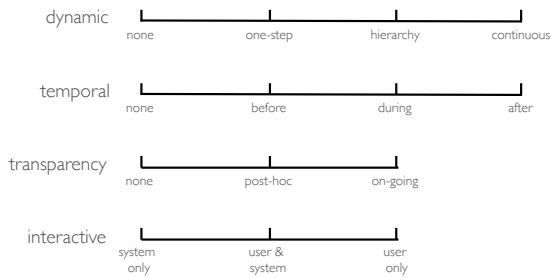
Identify the key ideas

Categorize the ideas into design dimensions

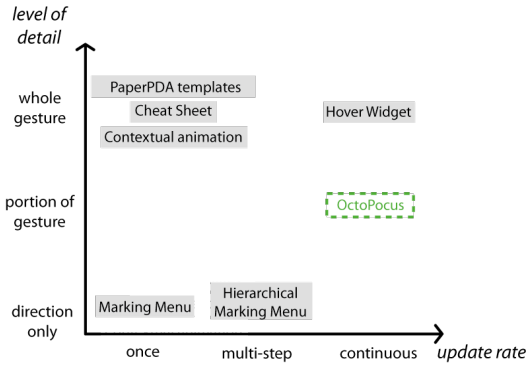
Place the ideas along the design dimensions
- 3 or more ideas per dimension
- generate new ideas if you find gaps
- explore the intersections of different dimensions

Create a design space to explore:
Choose interesting dimensions and ideas

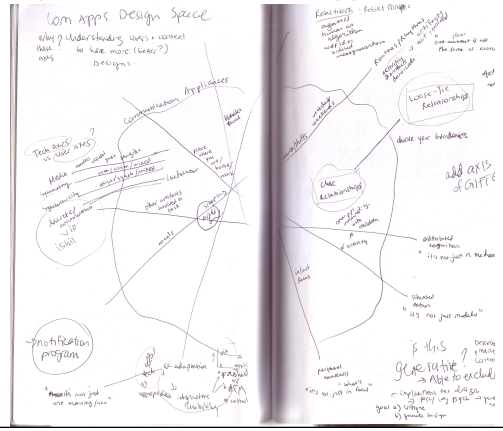
Design Dimensions: Octopocus



Design space: Octopocus



Design space: Communication Apps



Generative Design

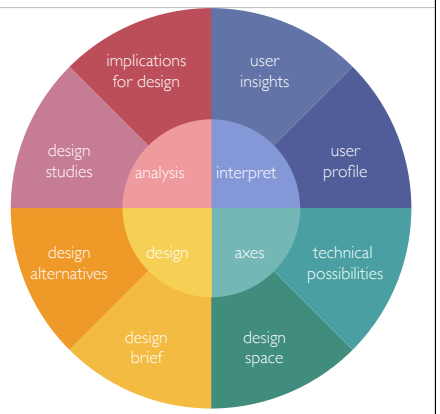
Discovery
Who is the user?

Invention
What is possible?

Design
What should it be?

Evaluation
Does it work?

Redesign
How to improve it?

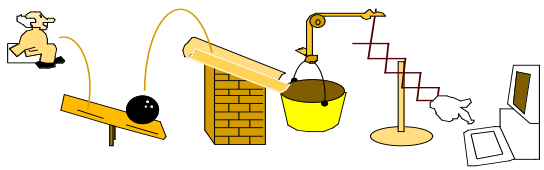


Design
What should it be ?

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

Non-interactive (fixed)
No interaction, but can show potential interaction
example: a video clip showing user interacting with a device

Low interaction (pre-determined path)
Can test several alternative forms of interaction
example: designer shows a screen shot, user indicates her action, the designer shows the result

High interaction (open)
Users interacts with the system, with some limitations
example: Wizard of Oz or computer-based simulation

What's wrong with wireframes?

Graphic designers create wireframes
Focus on screen layout, not interaction
Static, not dynamic
Encourages procedural interaction
Assumes buttons, sliders and pulldown menus
(least efficient forms of interaction)

Interaction designers should focus on *interaction*
Create simple, but powerful interaction

Competing interaction paradigms

Computer as *tool*
First person interfaces
Empower users

Human-computer interaction

Computer as *servant*
Second person interfaces
Delegate tasks

Artificial intelligence

Computer as *medium*
Third person interfaces
Communication

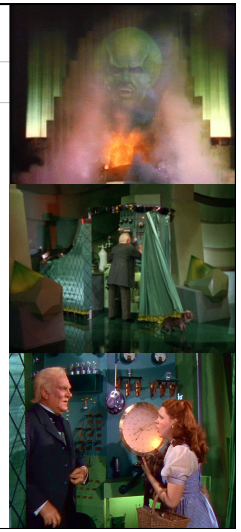
Mediated Communication, Social media

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

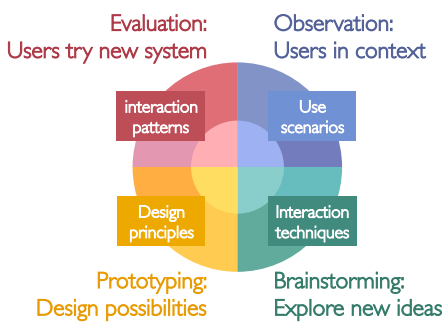
Vertical: complete functionality of part of the system
example: develop the spelling checker fiirst

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

Beaudouin-Lafon and Mackay (2007) Prototyping Tools and Techniques

Video supports every phase of design



Design

Design
Concept

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

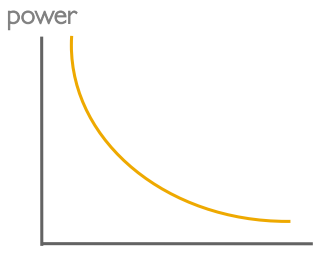
Creating a concept

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

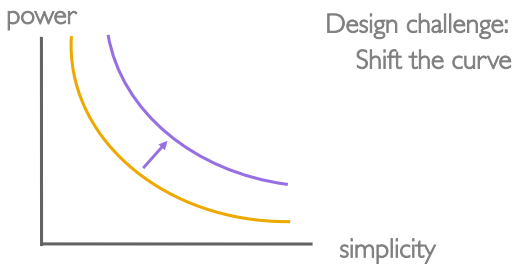
Be curious, be creative, seek surprises and new opportunities

Design Trade-offs



Balance trade-off between
power of expression
and simplicity of interaction

Design Trade-offs



Design challenge:
Shift the curve

Simple things should be simple,
complex things should be possible

Describe the design concept

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

Justification
- What are the alternatives?
- What are the advantages and disadvantages of this solution?

Describe the design concept

How will the user be able to do?
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Justification
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One strategy

Find a key object of interest for the user
- Make it persist
- Make it interactive

Example:
- Search for a route
- Create a 'route' object
- Create an interactive route object
  - modify, extend, transform
  - share, compare . . .

Avoid Analysis Paralysis

CHOOSE SOMETHING !!

The first idea is NEVER complete or right or "good"

ALWAYS reevaluate, redesign, and refine

Exercise: Concept

Can you describe your design concept
in one sentence?

What user problem(s) does it solve?
Is the interaction clear?
What technology does it use?
How does it help users?

Design

Design Alternatives

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!

Interaction Table

Interaction Table

Goal

Top-down description of key functions and objects
and the details of how to interact with them

Procedure

List the conceptual objects in the system
List the functions available for manipulating those objects
Describe how each object is represented in the interface
Describe how to access each function via interaction techniques
Describe which interaction techniques affect which functions

Ensure completeness
Ensure coherence

Exercise: Interaction table

Table 1 : Table of functions

	Function	Object	Interaction	Effect
1	scroll	webpage	click on the scrollbar	scroll the page
			touch Page Up/Down	scroll the page
2	jump to a link	link	click on the link	go to the destination page

Table 2 : Table of Objects

	Object	Properties	Representations	Functions
1	web page	HTML text	window with page	scroll
		links	content	add favorites
		images		
2	link	page destination	underlined text	jump
				save

Design

Diagram

Design Diagram

Capture the essence of your design with a diagram

Examples:
- exploded diagram with key functions
- process diagram with arrows

Design concept

Diagram

Lunch!

Design
Design Scenario

Using your 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

Use Scenario

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 scenarios 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 market or '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 situtions
- 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

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
Story:	Paragraph-by-paragraph description of who does what and why.

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 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

Storyboards 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

Design
Storyboards

Storyboard

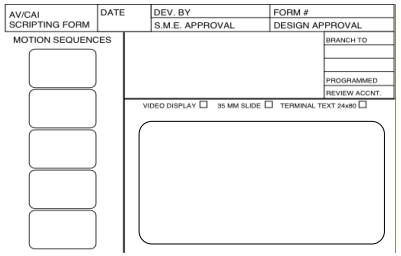
Goal
- Illustrate the design scenario,
  - emphasizing the details of the interaction with the system being designed

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



Digital Equipment, 1982

Storyboards

Moment Highlight what matters, omit the rest
Interaction points

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

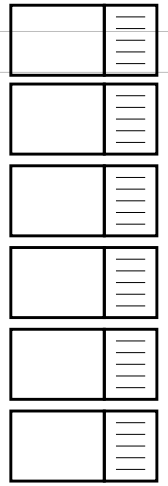
Image Evoke characters, objects, environments
Focus on the user's interaction
Use simple special effects

Words Communicate ideas, voices
Intertitle (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



Title
User(s)
Situation

Establishing shot
First interaction

Closeup shot
Second interaction

Mid-range shot
Third interaction

Wide shot
Forth interaction

Final credits

Storyboard structure

Buena Vista CommApp	*System title* *Group*		*close-up* show the interaction
Ann and Pierre are engaged, but live in different towns. He's in a meeting …	*intertitre* explain the situation		*close-up* show the interaction
	*establishing shot* show the situation	Pierre leaves a message	*intertitle* continue the story
	*mid-shot* show Pierre and the technology	Anne Dubois Bob Martin Charles Smith	*credits* Group members

Tuesday afternoon

Review class exercises:
- Concept
- Alternatives
- Interaction table
- Design diagram

Design scenario
Paper Storyboard 1

Design
Prototyping

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 ?

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Wizard of Oz

Technique for prototyping
novel user interfaces

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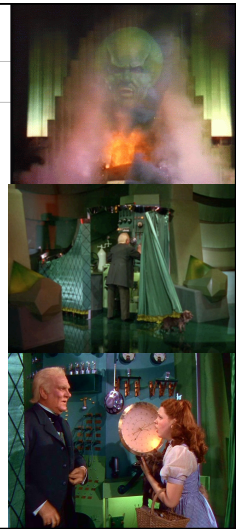


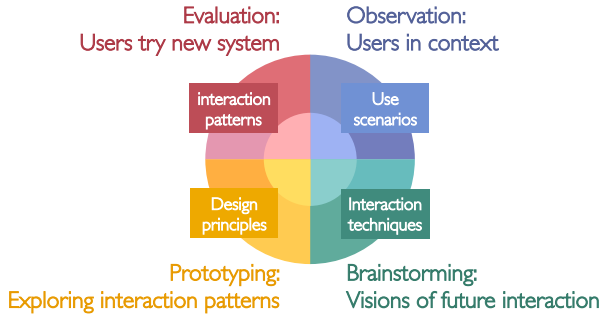
Wizard of Oz

The designer/wizard interprets the actions of the user
and controls the responses of the system
The user experiences what the 'real' system might be like

The system may be:
non-existent
partially built
completely functional

Best for certain types of
interaction (based on
wizard's reaction time)

Video supports every phase of design



Design
Storyboards

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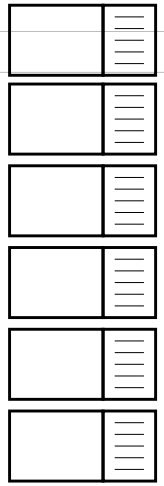

Storyboard structure