Advanced Design and Evaluation
of Interactive Systems

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Slides: *http://insitu.lri.fr/People/AdvancedDesignOfInteractiveSystems2017*
HCI Bootcamp slides: *http://insitu.lri.fr/People/HCIBootcamp2017*

ExSitu lab, Inria & Univ. Paris-Sud
21 February 2018

For Thursday: (morning session)

Each group should prepare a 70-minute
    participatory design session for another group
    • Design 3 activities   (NOT interviews!)
    • Create 3 method cards

What do you need to decide?
How will the results of these activities
    help you modify your design?

Participatory
Design
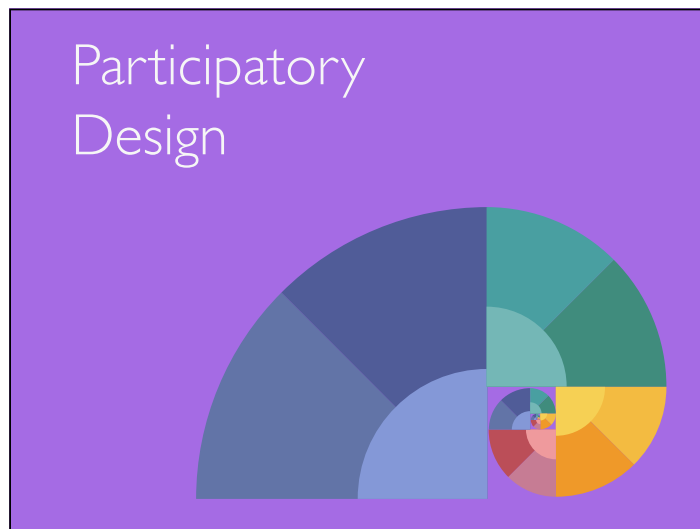
Participatory Design

Include users and designers in collaborative design

Participatory Design

Techniques include regular and video brainstorming,
developing scenarios, paper prototyping and
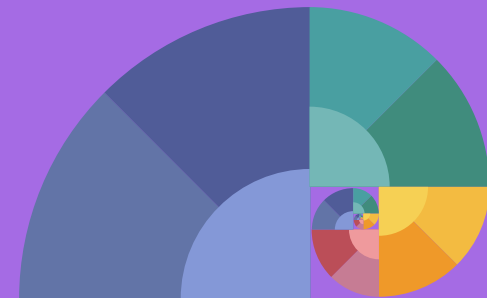video prototyping

Why participatory design?

Asking users ≠ letting them show you

It is hard to figure out what the user experiences…
    especially if you are not one of your own users.

Your instincts are not enough and often wrong
    … and get worse as you delve deeper into the design.

You will understand the system more
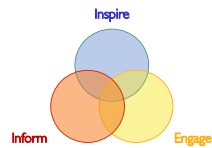   … but the user less.

Cultural Probes

Cultural probes

Purpose

Exploration of Research/Design Space
Challenge assumptions
Validate predictions
Look for unexpected
Gather subjective, intimate material
Dialog with users

Deployment
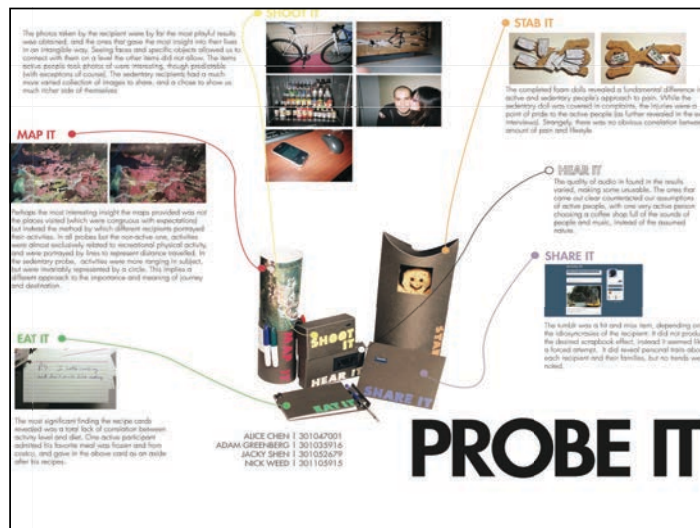
Involve users
Consider privacy
Required resources
Length of time

Classic probes:

disposable camera with questions
diaries
dream recorder



Example: Participatory design with families

Established long-term relationships
"home" work
interviews
workshops
cultural probes
technology probes

interLiving

Designing Interactive, Intergenerational
interfaces for Living Together. IST-2000-26068
http://interliving.kth.se

Cultural probes for InterLiving project

"Probe kit" sent to users
with stamped envelopes to return materials
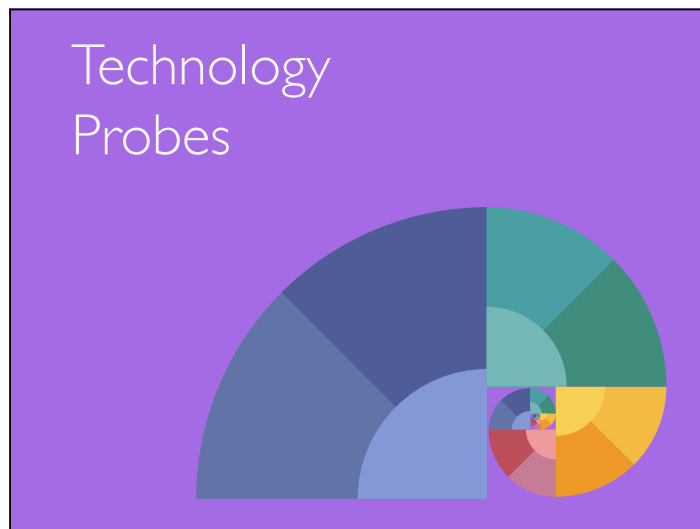
Technology
Probes

Technology probes

Goals:
- inspire users and designers to generate new design ideas
- understand how a technology is used in a real world setting
- study emergent behavior patterns around new technologies
- create common ground for subsequent design

Combine three perspectives:
Scientific: collect data about users *in situ*
Engineering: test technical infrastructure
Design: inspire new ideas

Technology probes

Three phases:
  1. Introduce technology to users
  2. Observe and interpret use in situ
  3. Participatory design to explore alternatives and new ideas
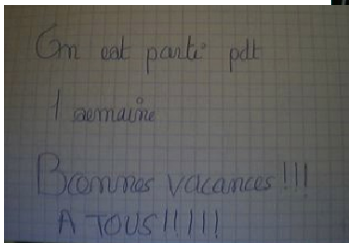
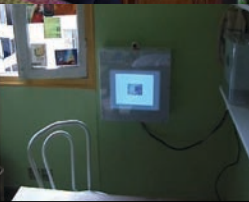| Compare:	Technology probes	Prototypes
Simplicity:	Single function	Multiple functions
Usabilty:	Not the focus	Major focus
Logging:	Major focus	Secondary focus
Flexibility:	Open-ended	Specified purpose
Originality:	Unusual, provocative	Relevant to needs
Design cycle:	Early-middle	Middle-end
Longevity:	Throw away	Evolvable
Concept:	Still unclear	Mostly defined

Example: InterLiving

Goals:
  learn about family communication
  discover real-world technological constraints
  spark new ideas

Technology probe, not a prototype:
  Simple, single function technology
  Installed in home settings over time
  Open to reinterpretation by users
  Instrumented to log data
  Follow-up prototyping in participatory design workshops

Participatory design with families

Design
methods:

Cultural probes
Design workshops
"Home" work
In situ observation

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MessageProbe

Hand-written notes on a tablet screen
Synchronous or asynchronous
Zoomable interface
All notes shared among all households
Temporal or selected order

MessageProbe

conversations between   message?
grandpa and grand children   conversation?
                               game?

VideoProbe   *IHM '03*

Images captured by video camera
    3" without motion = 1 image
    Feedback before taking picture
    Shared picture archive

"We're leaving for a week!

Happy Vacation Everybody!!"

Testing in the home

Use differs in
different
settings:

VideoProbe

View images with remote control
Images fade unless explicitly saved

Marker Clock

Peripheral awareness for seniors at
home
  Monitoring vs. Peer-care
  Implicit sharing: movement on clock face
  Explicit sharing: leaving markers

Field tested with seniors in France
  Easily interpretable by people who

Exercise: Design a probe

What would you like to find out about your users?

What kind of existing device can you use that will:
    capture relevant information from them
    provide elements of a new experience that
        helps inspire ideas relevant to your project?

Cultural probes: Discover user characteristics
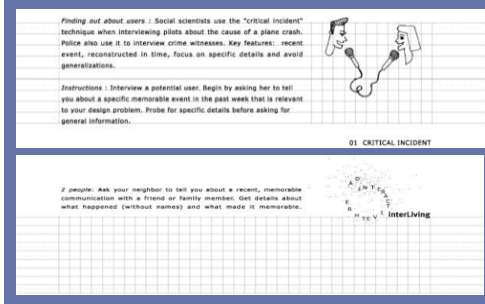Technology probes: Inspire new designs

TableProbe

Tangible
interface
  for
collaborative
video
editing

RFID tags
30" clips

Outside main
conference
room

Table Probe

TableProbe for collaborative video editing
Participatory design toolkit

What did we learn?

TableProbe: made it simpler

Inspired StoryTable

StoryTable: Tangible video editing

Physical objects represent video information
   Card with RFID tag
   30-second video clips (super-imposed)

Manage on-line video clips with physical cards

IST interLiving project   31

Example: MessageProbe

Hand-written notes on a tablet screen
Synchronous or asynchronous
Zoomable interface
All notes shared among all households
Temporal or selected order

INRIA
Confidential

INRIA 2004 /
Confidential   33

TableProbe → StoryTable

Tangible, Collaborative Video Editing
    RFID tagged cards control 30'' super-imposed video clips
        First, a communication table next to the front door…

INRIA 2004 /
Confidential   34

TableProbe → StoryTable

Tangible, Collaborative Video Editing
    RFID tagged cards control 30'' super-imposed video clips
        First, a communication table next to the front door…
            Evolved into a child's interactive puppet theatre

INRIA 2004 /
Confidential

VideoProbe

Images captured by a video camera
    3'' without motion = 1 image
Image archive
    shared between households

"We're going away for a week

Happy vacation Everybody!!"

INRIA 2004 /
Confidential   36

VideoProbe

Images captured by a video camera
   3 seconds without motion = 1 ima...
Image archive
   shared between households
View images with a remote control
Images fade unless explicitly saved

INRIA 2004 /   **37**
Confidential

→ MirrorSpace

Handling privacy concerns:
   Distance to mirror controls
   video image & communication

Proximity sensor, image analysis
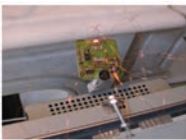   Far away: blurry image
   Approach: crisp image

INRIA 2004 /
Confidential

→ MirrorSpace

Handling privacy concerns:
   Distance to mirror controls
   video image & communication

Proximity sensor, image analysis
Camera placed in center of screen

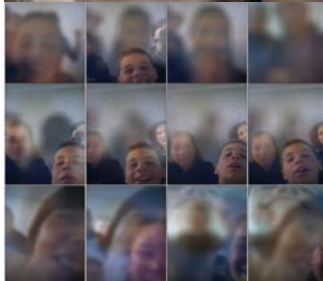**INRIA 2004 /**
Confidential

→ MirrorSpace

Handling privacy concerns:
   Distance to mirror controls
   video image & communication

Proximity sensor, image analysis
Camera placed in center of screen
Exhibited at:
   La Villette
   Pompidou Centre

Family members get much closer
   than strangers…

INRIA 2004 /
Confidential

Home installation

We installed several communication appliances in the families' homes, over weeks and months

(Sweden, France & United States)

INRIA 2004 / Confidential   **41**

Marker Clock   Interact '07, JCSCW '10

Peripheral awareness for seniors at home
  Monitoring vs. Peer-care
  Implicit sharing: movement on clock face
  Explicit sharing: leaving markers

Field tested with seniors in France
  Easily interpretable by people who
  know each others' rhythms and routines


WeMe   HCII'09

A "Conversation Piece" that supports
  multiple engagement and multiple interpretation.

Bubbles move in response
  to ambient sounds
  (local and distant)
1-3 people per household
  can create patterns

WeMe

Nightboard
Wautier MA '06

Remote couples stay in touch

Input:
movement detector
laser pointer
Display:
projection on the ceiling

Supports both
direct and implicit interaction

MissU
CHI '09

Sharing 'Empty Moments' between remote couples
Private 'radio channel'
Implicit : shared ambient sounds (dual control)
Explicit : shared music playlists
Exploration with 13 couples via technology probes
Social Science, Technology & Design results

Interactive Thread

Weaving an interactive thread
Participatory research methods
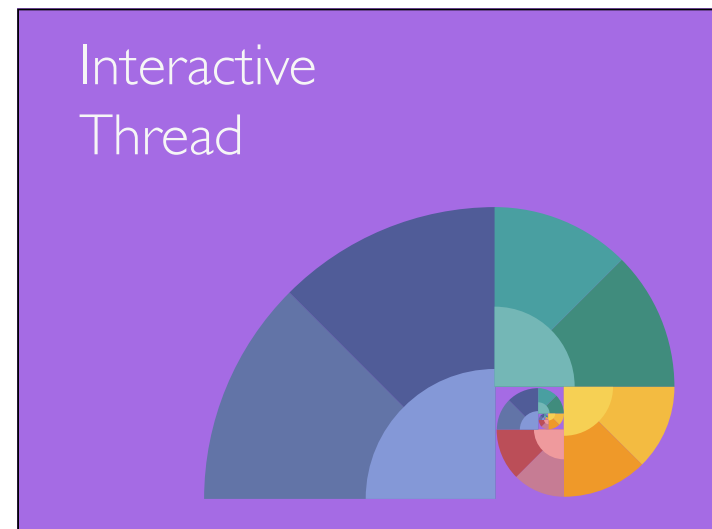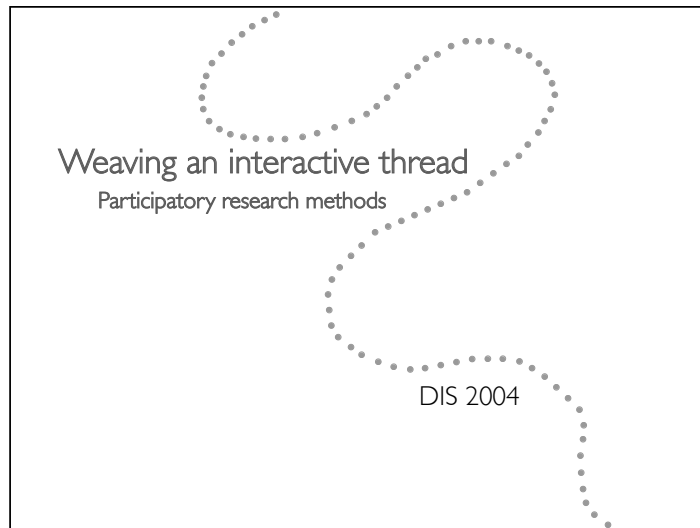
DIS 2004

Planning DIS 2002…

How to create a dynamic, interesting event that emphasizes:
  audience interaction?
  multi-disciplinary design methods?

Solution:
  An 'interactive thread' woven throughout the conference

Goals:
  Engage conference attendees
  Demonstrate diverse design techniques
  Collect user data

DIS 2004

Goal: collaborate on a common design

Create a focal point: Henrik Färling's poster with stories
                         stories from the interLiving project

Create ten
  10-minute exercises
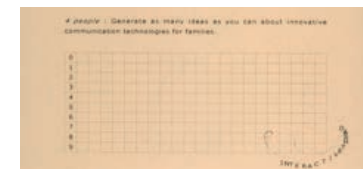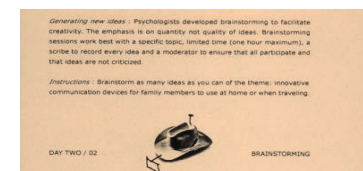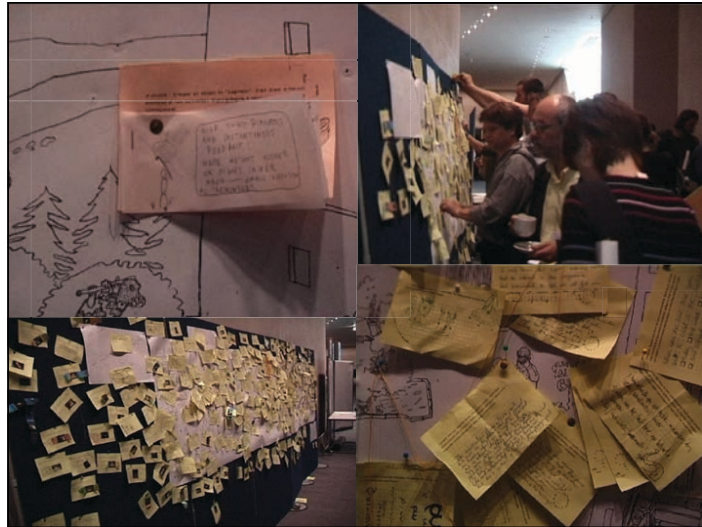 that build upon
  each other

interactive thread cards

One card per exercise:

Front: Describe goal
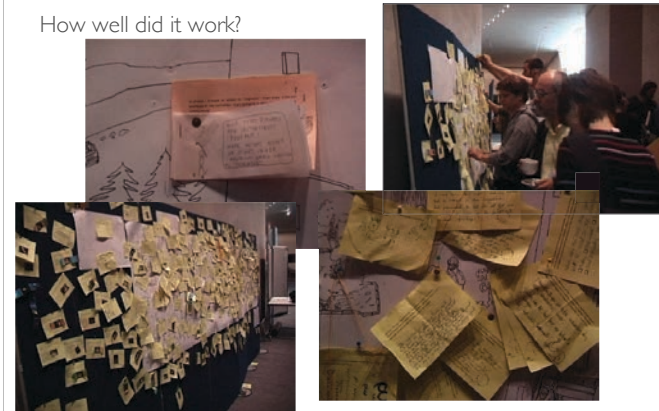   and instructions

Back: Specific task
        and workspace

DIS 2002

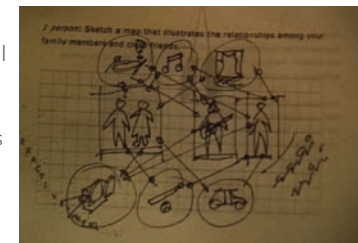How well did it work?

interactive thread
DIS 2002

What we learned

What worked well:
  Poster as focal point
  Early, short exercises
  Data gathering exercises
  Participant interaction

What worked less well:
  Removing poster after day 1
  Longer exercises
  Too many exercises
  Stress from linked exercises

Additional tests

Conference:
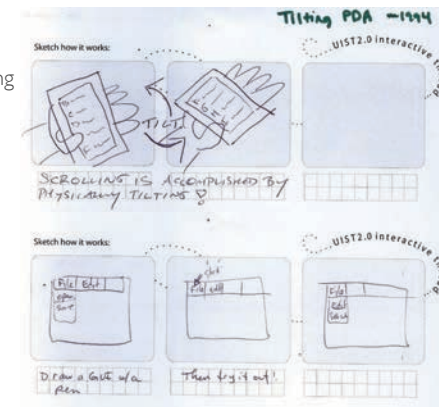   UIST '07 20th anniversary
   Newport, Rhode Island

Modifications:
   Timeline poster,
   past and future
   Banquet exercise

Capturing the past on a timeline

Experts fill in the
history of interactive
technology, identifying
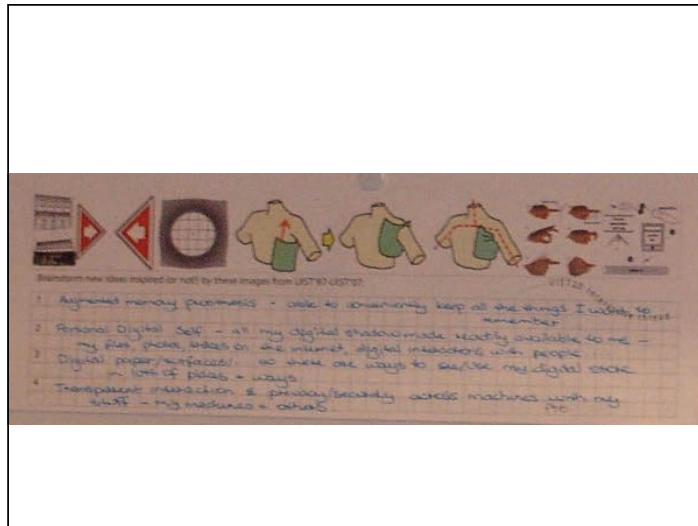specific examples
and placing them
on a large timeline.


Capturing the past

Designing the future

Building on the past to brainstorm
about the future…

Possible interactive thread events

Post-class exercise
    students perform exercises just before the bell rings
Experiment debriefing
    subjects interview each other after a session
Corporate meetings
    expose everyone to interactive design techniques
Seminars or conferences (sessions or banquets)
    get specialized interviews from doctors,
    air traffic controllers, fighter pilots and
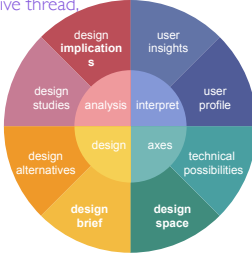   other hard-to-access users

Participatory Design Workshop
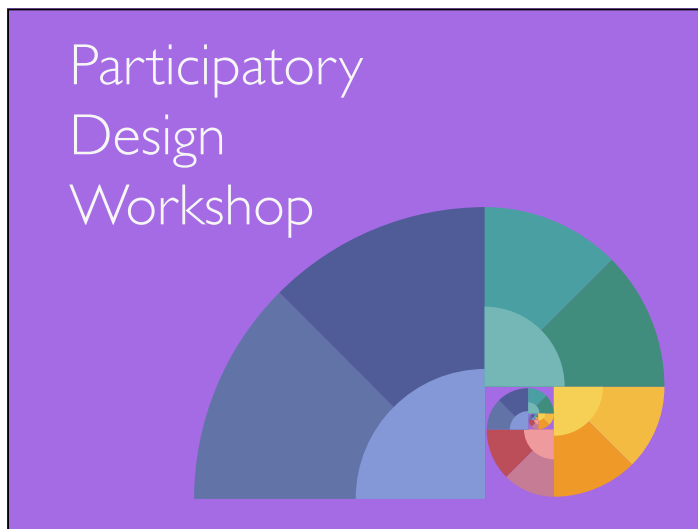
Participatory design workshops

Bring together users and designers
Create an environment for collaborative exploration of ideas

Activities can:
    capture experiences
    create scenarios
    brainstorm ideas
    explore ideas

Do not ASK users …
    help them to
    show, tell or act.

Create new design activities

Users: Interviews, use scenarios, personas, *cultural probes*

Design ideas: Brainstorming, video brainstorming, web links

Prototypes   Design scenarios, storyboards, video prototypes
                 design concept, overview diagram,

Evaluations: Design walkthroughs, experiments, *field and user studies*

Redesign: Generative walkthroughs, interactive thread,
                 cultural probes, *technology probes*

Actively involve users throughout
    the design process

Consider which techniques work
    for which users

Try to establish long-term relationships
    not just 'one-offs'

Exercise: Design a participatory design workshop

Decide on: participants, setting, schedule, activities
    Ratio of team members to users?

Preparation:
    Materials? Pre-workshop activities?

Workshop activities:
    Which activities from class are appropriate?
    Can you think of any others?

Follow-up activities:
    What do participants get as a result of participating
    (Need not be money or gifts … but they should benefit)

For Thursday: (morning session)

Each group should prepare a 75-minute
    participatory design session for another group
    • Design 3 activities   (NOT interviews!)
    • Create 3 method cards

What do you need to decide?
How will the results of these activities
    help you modify your design?