

Questions?

- Broken hardware
 - Why was it not reported?
- Project Step 3 due next week
- Show and Tell due this Thursday
- PWM circuit

Evaluating your design

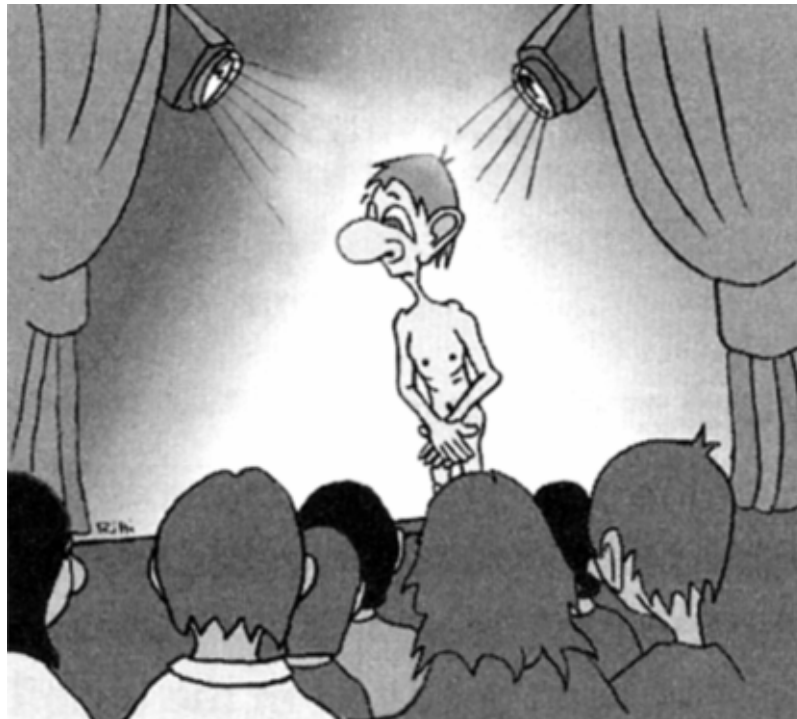
- Proceed in a hierarchical manner
 - Sub-system testing
 - *Does the hardware design work?*
 - Integration testing;
 - *Are the different part of the design working together?*
 - Specifications testing;
 - *Does the application perform as expected (per specifications)*
 - Users testing
 - *Will users be able to use the system?*
 - *Does the system fulfill users' goals*
- An iterative approach will lead to best results

Questioning measurements

- Are they reliable?
 - Does the experiment take into account possible variations in measurement?
 - *Need for testing a sample of subjects*
- Are they valid?
 - Does the experiment reflects target use?
 - *Were users typical?*
 - *Were tasks typical?*
 - *Was the setting realistic?*
 - *Was the experience biased?*
- Do they make sense?
 - Setting the stage for discovery!

The participant standpoint

- Testing is a distressing experience
 - Pressure to perform
 - Feeling of inadequacy
 - Looking like a fool in front of your peers, your boss,...



(from "Paper Prototyping" by Snyder)

Treating subjects with respect

- Follow human subject protocols
 - Individual test results will be kept confidential
 - Users can stop the test at any time
 - Users are aware (and understand) the monitoring technique
 - Their performance will have not implication on their life
 - Records will be made anonymous
 - *Videos*
- Use standard informed consent form
 - Especially for quantitative tests
 - Be aware of legal requirements

Ethics: The Stanford prison experiment

- Was it useful?

“...that’s the most valuable kind of information that you can have - and that certainly a society needs it” (Zimbardo)

- Was it ethical?

- Could we have gathered this knowledge by other means?

Conducting a test

- Before the experiment
 - Have them read and sign the consent form
 - Explain the goal of the experiment
 - *In a way accessible to users*
 - *Be careful about the demand characteristic*
 - *Answer questions*
- During the experiment
 - Stay neutral
 - *Never indicate displeasure with users performance*
- After the experiment
 - Debrief users
 - *Inform users about the goal of the experiment*
 - Answer any questions they have

Managing subjects

- Don't waste users time
 - Use pilot tests to debug experiments, questionnaires, etc...
 - Have everything ready before users show up
- Make users comfortable
 - Keep a relaxed atmosphere
 - Allow for breaks
 - Pace tasks correctly
 - Stop the test if it becomes too unpleasant

Direct observation method

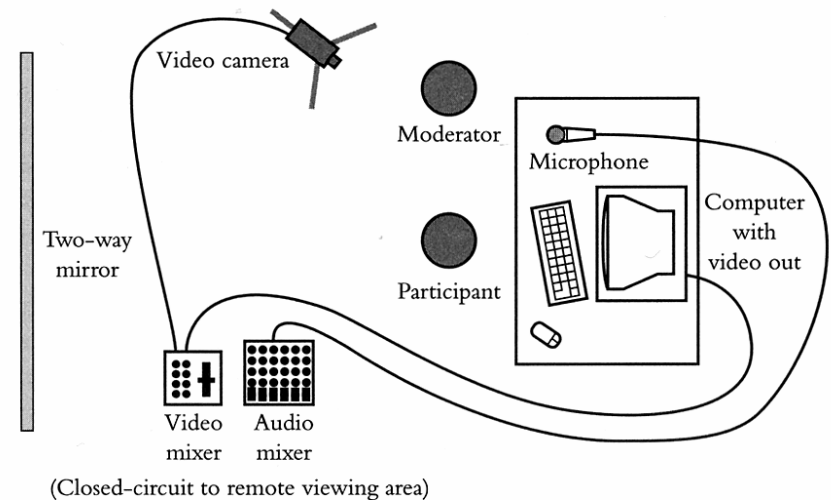
- Observing (and recording) users interacting with the system
 - In lab or in the field
 - For a set of pre-determined tasks or through normal duties
 - *Be prepared!*
- Excellent at identifying gross design/interface problems
- Three general approaches:
 - simple observation
 - think-aloud
 - constructive interaction

Be prepared!

- Select the correct population
- Set objectives and Tasks
 - Realistic
 - Informative
- Apply for the IRB
 - <http://www.umresearch.umd.edu/IRB/>
- Hardware
 - Computer, video equipment...
- Software
 - Up and running, properly debugged...
- Facilitator
 - Using a checklist might be useful
 - Practice!

Recording observations

- Need a record
 - Further analysis
 - Proofs during discussion
- Techniques
 - Paper and pencil
 - *Simple to set up*
 - Free form
 - Coding scheme
 - *Might be biased*
 - Audio/Video recording
 - *More accurate*
 - *Time consuming to analysis*
 - Encoding is a time consuming process



From "Observing the user experience" (Kuniavsky)

Coding scheme example

- Tracking activity in the office

Time	Desktop activities			Absences		Interruptions	
	Computer	Desk	Telephone	Desk	Room	Visitor	Telephone
9:00	s						
9:02	e					s	
9:05					s	e	
9:10			s		e		
9:13							

Simple observation method

- Evaluator observes users interacting
 - Sometime behind a half-silvered mirror
- Drawback
 - No insight into the user decision process or attitude

The think aloud method

- Subjects are asked to say what they are thinking/doing
 - What they believe is happening
 - What they are trying to do
 - Why they took an action
- Widely used in industry
- Drawbacks
 - Awkward/uncomfortable for subject (thinking aloud is not normal!)
 - “Thinking” about it may alter the way people perform their task
 - Hard to talk when they are concentrating on problem

The constructive interaction method

- Two people work together on a task
 - Normal conversation between the two users is monitored
 - *removes awkwardness of think-aloud*
 - Variant: Co-discovery learning
 - *Use semi-knowledgeable “coach” and naive subject together*
 - *Make naive subject use the interface*
- Drawback
 - Need a good team

Debriefing

- Post-observation interviews
 - Questions from your notes
 - Questions from users diary
 - Questions from a video footage
- Very important
 - Avoids erroneous reconstruction
 - *Provide many constructive suggestions*
 - Let participants understand their role in the research process

Example