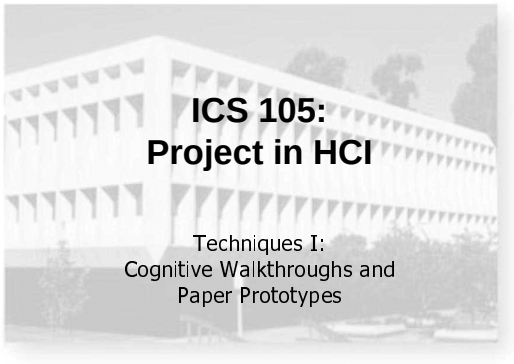


# ICS 105: Project in HCI

Techniques I:
Cognitive Walkthroughs and
Paper Prototypes

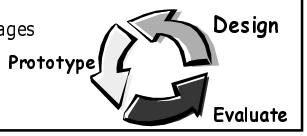
## the usability requirement

## administrivia

- project teams
  - check the web page and see if it's right
  - email us with team rosters and assignments
- project guidelines document
- meetings with Doshi
  - check information at http://www.ics.uci.edu/~jpd/ics105

## design/evaluation techniques

- design and evaluation are tightly coupled
  - in fact, we want to get them as close as possible
    - evaluate as you design
    - design as you evaluate
    - iterate on the results
- next few lectures focus on techniques
  - methods and mechanisms
  - design & evaluation
  - apply at different stages




## inspection techniques

- two basic approaches
  - user-based techniques
    - watch real people use the interface in more or less formal settings
  - inspection-based techniques
    - evaluation of the interface through inspection by experts
    - similar to SE code review
- generally, you need *both*
- caveats
  - only as good as the people performing them
  - only as good as the theories they embody

## inspection techniques

- structured versus unstructured approaches
  - methods
  - reports
- the difficulty of finding the right reviewers
- various approaches
  - usage simulation
  - heuristic evaluation
  - cognitive walkthrough

## heuristic evaluation

- structured evaluation against heuristics
  - use simple and natural dialogue
  - speak the users' language
  - minimize user memory load
  - be consistent
  - provide feedback
  - provide clearly marked exist
  - provide shortcuts
  - provide good error messages
  - prevent errors

## heuristic evaluation

- advantages
  - faster and easier to perform
  - structure helps get the process started
  - good place to start
- disadvantages
  - very generic, not specialised to different needs
  - not particularly detailed
  - heuristics needs to be interpreted

## cognitive walkthrough

- what's a cognitive walkthrough?
  - walkthrough – stepping through the interface as a user would encounter it
  - cognitive – evaluating, step-by-step, the cognitive loads and requirements of the interface
- structured technique
  - structure imposed by the task being performed
  - very structured report format

## cognitive walkthrough

- goals and tasks
  - cognitive walkthrough of
    - a particular interface, being used to perform
    - a particular task
- procedure
  - define task and actions
  - step through execution
    - at each step, ask a series of questions
    - focused on goal formation and goal achievement
    - ask, what percentage of people will have a problem?

## cognitive walkthrough

- problems forming correct goals
  - failure to add goals
  - failure to drop goals
  - addition of spurious goals
  - no-progress impasse
  - premature loss of goals
  - supergoal kill-off

## cognitive walk-through

- problems identifying action
  - correct action doesn't match goal
  - incorrect actions match goals
- problems performing the action
  - physical difficulties
  - time-outs

## walkthrough sheet

1. description of user's immediate goal
2. (first/next) atomic acton user should take:
   a. obvious that action is available?
   b. obvious that action is appropriate?
3. how will user access description of action?
   a. problem accessing?
4. how will user associate description with action?
   a. problem associating?
5. are all other available actions less appropriate?
6. how will user execute the action?
   a. problems?
7. if timeouts, time for user to decide before timeout?
8. execute the action. describe system response
   a. obvious progress made towards goal
   b. user can access needed information in response?
9. define appropriate modified goal, if any
   a. obvious that goal should change?
   b. if task completed, is it obvious?

## cognitive walkthrough

- advantages
  - systematic evaluation
  - theory-based
- disadvantages
  - experts can be biased and blind-sided
  - extremely time-consusming and detailed
    - various alternative approaches exist
      - the cognitive "jog-through"

## paper prototypes

- early engagement with users
  - the earlier the better… head off problems
  - better to engage before you start to build
  - minimise wasted development effort
- paper prototyping
  - user engagement with interface mock-ups
  - paper isn't interactive, so you need to be

## paper prototyping

- before you start
  - what you'll need
    - heavy paper, index cards, tape, pens & markers, scissors
    - a well-worked out design!
    - tasks and scenarios
  - build the model
    - draw window frame on large paper
    - put different screen regions on card
      - anything that appears, disappears, changes, moves
    - ready response for user action
      - pull-down menus, for example
    - use photocopier to generate generic objects
      - error and input dialogs

## paper prototyping

- beforehand
  - select your users
- the session
  - introduce them to the interface and the task
    - give tasks IN WRITING
- afterwards
  - debrief (questionnaire)
  - ask about things you saw problems on
  - gather their impressions
  - thank them!

## paper prototyping

- during the session
  - one person to facilitate
    - interact with user – *ONLY PERSON WHO SPEAKS!*
    - keep getting "output" from user
      - "what are you thinking now?"
      - "what do you need to do next?"
    - you're there to *observe*
      - not to laugh, observe, comment, criticize, or guide
  - one person to "be the interface"
    - respond to user input
    - simulate the application logic

## paper prototyping

- during the session (contd.)
  - one person to supply the interface
    - manage the paper resources
    - produce new ones
    - keep track of what's going on and likely to happen
  - one person to observe and take notes
    - no intervention, just watch and observe

## paper prototyping

- important things to remember
  - you need to really know the interface
    - you can't go into this with a partial understanding
    - know what happens for each potential mouse click
  - you can always generate new interface components
    - many will be generated on the fly
    - remember that paper can be layered…!
  - figure out where precision's needed and where it's not
  - when "being" the interface, be no more or less
    - no extraneous hints
    - just respond to what the user's doing

## paper prototyping

- advantages
  - takes only a few hours
  - no equipment needed
  - can test multiple alternatives
- disadvantages
  - some interfaces more complex to fake
  - can be hard to achieve suspension of disbelief

## silk video

## for next time

- still need those project groups!
- make appointment times with Doshi
- next time, more on techniques
  - usage data and predictive evaluation
  - ch 30, 31