Overview:
- Usability Evaluation
- Types of evaluation
- Evaluations methods
  - Analytical methods

Reminder: Mid-project progress report due Friday

Usability Evaluation
• Any analysis or empirical study of the usability of a prototype or a system
• Goal is to provide feedback in software development. Answer questions like:
  - Is system sufficiently useful?
  - Is it too difficult to use or learn?
  - Is it not satisfying to use?
  - Does it meet the stated goals?
• Understand problems and causes; plan changes to correct them

Types of Evaluation
• **Formative** evaluation – done during system development. Drives redesign. Often done by asking user to verbalize thoughts during user test of prototypes
• **Summative** evaluation – done at the end of project or other checkpoint. Answers “how well did we do?” Generally done by measuring performance times and error rates.

Evaluation Methods
• **Analytical** methods – study the design/system characteristics and compare with theory, modeling, or guidelines (from experts)
• **Empirical** methods – study how users use system via observation, surveys, controlled experiments
• Need both: Is it a bad implementation of a good design or a good implementation of a bad design?

Evaluation Methods 2
• How to choose what methods to use?
• Which is more expensive?
• Which carries more weight with developers?

Analytical Methods
• SBD claims analysis
• Usability inspection
  - Expert walk-through based on guidelines or checklist (more than one if possible)
  - Walk-through at different levels or categories
  - List problems in each level/category, order by severity
Analytical Methods 2

- Cognitive walk-through for walk-up and use systems (e.g. ATMs)
  - Look for affordances, metaphors
  - Careful task selection, answer questions at each step: what comes next, what is assumed, are there any competing goals
- All methods use checklist forms, very popular with industry – generates lots of data for low cost

Heuristic Evaluation – Homework 5

- Nielsen (1994) gives 10 general guidelines
  - Want multiple experts
  - Want point of view (POV) of different classes of stakeholders
- Homework 5 due on Monday: apply Nielsen’s guidelines to www.amazon.com, discuss on Monday

Model-Based Analysis

- User is modeled as a breakdown of goal identification, steps to achieve goal, implementation of steps, and selection rules
- Predictive model developed using scientific knowledge of human memory and behavior
  - Use model elements for mental activities
  - Like HTA, also estimate task times for alternatives

GOMS Example

- Goals, Operators, Methods, Selection rules
- Example: how to close Firefox tab

```
GOAL: CLOSE-ACTIVE-TAB
 |-{select GOAL: USE-MENU-METHOD
 | |-MOVE-MOUSE-TO-MENU-BAR
 | | DRAG-DOWN-FILEMENU
 | | RELEASE-ON-CLOSE-OPTION
 | |----GOAL: USE-HANDLE-METHOD
 | | |-MOVE-MOUSE-TO-INTERNAL-CORNER
 | | | CLICK-ON-CLOSE-BOX
 | | |----GOAL: USE-CONTROL-KEY
 | | | | PRESS-ALT-P
 | | | | PRESS-CTRL-W
```

Tradeoffs

- Usability inspections are fast and cheap BUT
  - Miss details only seen in actual use
  - Doesn’t identify causes of problems
  - Emphasizes problems that are infrequent or atypical in actual use
  - Contributes little to overall HCI theory

Tradeoffs 2

- Model-based analysis has scientific foundation and is powerful and credible BUT
  - Limited to the scope of the theory
  - Time-consuming to develop
  - Ignores higher level structures of behavior