Midterm Review
Administration
Midterm

- 80 minutes, start promptly at 14:05

- Style:
  - Short answer
  - Essay: apply a concept
  - Problem solving: programming (limited)
Learning Goals

• Express yourself in executable form
• Basics of what is hard and easy to rapidly prototype
• Terminology and approaches used by programmers, so you can work with them
• Experience pain of programming
• Design and conduct informal user tests
User Interfaces Introduction

• Terms: Users, user interfaces, usability

• Why are interfaces important?

• Why are interfaces hard to design?

• Why are interfaces hard to implement?
What is Design?

- Terms: design, affordances, user conceptual model, constraints, natural mappings, feedback
- Good and bad examples
- Norman’s 7 stages
- Gulf of evaluation and gulf of execution
- Tradeoffs/issues
- Design support
- How designers work
Usability Engineering Design Process

- Terms: waterfall model, iterative process
- 10 steps of process, issues
  1. Study the users and their tasks
  2. Study the competition
  3. Set usability goals
  4. Participatory Design
  5. Coordinating the Total Interface for Consistency
     - Include documentation, help, etc.
  6. Guidelines and Heuristic Evaluation
     - Evaluate your interface according to the guidelines.
  7. Make prototypes of the system early and quickly
     - Actually is faster to prototype first
  8. Empirical testing
  9. Iterative design
  10. Collect feedback from field use

- Obstacles/warnings
Prototyping

• Terms: prototype, lo-fi, medium-fi, high-fi
• What, why, who, when, how
• Types of prototypes
• Types of prototyping
• Trade-offs
• Testing
• Support tools
• Paper prototyping exercise/lessons
UI Software Organization

• Terms: separation of concerns, windows system, windows manager, toolkit, UIDE
• UI flow
• Models
  – Model-View-Controller
  – Object-oriented
• Layers of UI software
• Window System: input and output model
• Window Manager
• Toolkit and High-Level Tools
Debugging

- Terms: bug, debugging
- Why debug?
- Why is it hard?
- Types of bugs, how to fix
- Debugging steps and approach
- Debugging strategies
- Tools
Output Styles

• Terms: metaphors, styles
• Issues with interaction styles
  – How do you choose?
• Interaction styles: pros/cons
  1. Question and answer,
  2. Single character commands and/or function keys,
  3. Command Language,
  4. Menus
  5. Forms/Dialogue Boxes
  6. Direct Manipulation
  7. WYSIWYG
     -- really is a subclass of DM, not another style
  8. Gestures
  9. Natural Language
 10. Natural Behavior
Output Graphics

• Terms: anti-aliasing
• Models: stroke, pixel, region, color
• Coordinate systems
• Drawing Objects: Lines, Bezier Curves, Fonts, FontMetrics, Images,
• Transformations
Input Devices

• Why harder than output?
• Devices: keyboard, buttons, valuators, locators,
• Absolute, relative, clutched absolute locators
Input Models

• Terms: events
• Logical devices, events, sampling
• Unified model of events
• What does an event consist of?
• Extending events
• Synchronizing problem
• Dispatching and handling events
Questions?