

# Course Summary

# Interaction Style Categories

- Command-line interfaces
- Menus
- Natural Language
- Q&A & query dialogs
- Form-fills and spreadsheets
- WIMP
- Point and click
- Three-dimensional interfaces

Know..

- What they are
- Advantages
- Disadvantages
- Features
- Comparisons
- Etc.

# Program Categories

- Sequential
- Event-driven

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# Types of Events

- User-initiated events
- System-initiated events

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# Java Events

- Event class hierarchy
- Event sources
  - E.g., mouse events, key events
- Listening for events
- Using Listeners vs. Adapters

# Swing Basics

- AWT vs. Swing
- Creating a window using JFrame
- JFrame's content pane

# WIMP Elements

- Windows
- Icons
- Pointers
- Menus

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# Containment Hierarchy

- Top-level containers
  - E.g., JFrame
- Intermediate containers
  - E.g., JPanel
- Atomic components
  - E.g. JButton

# Menus

- Recognize vs. recall
- Parts
  - E.g., menu bar
- Types
  - E.g., popup, cascading
- Features
  - e.g., separators
- Designing

# Widgets

- Buttons
- Combo boxes
- Tool bars
- Text components
- Sliders
- Scrollbars
- etc.

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# Buttons

- Push
- Radio
- Checkbox
- Modal

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# Text Components

- Output (aka non-editable)
  - Labels
  - Labelled borders
  - Tool tips
  - Message Boxes
- Input/output (aka editable)
  - Text fields
  - Text areas
  - Editable combo boxes
  - Dialog boxes

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# Validating Input

- Keystroke-level
- Focus-level
- Data-model level

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# Navigation Techniques

- Clicking with mouse pointer
  - Generates mouse/focus events
- TAB key
  - Generates focus event
- ENTER key
  - Generates key/action events

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# Widget/Component Layout

- The task: determine size and position of each component
- Component size properties critical
  - These are...
    - Preferred size
    - Minimum size
    - Maximum size
  - Used in different ways (sometimes ignored!) by layout managers

# Widget Layout Models

- Absolute (aka fixed)
  - Control for component size and position
- Struts and springs
  - Control for component position
- Variable intrinsic size
  - Control for component size

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# Java's Layout Managers

- BorderLayout
- FlowLayout
- GridLayout
- BoxLayout
- GridBagLayout
- CardLayout
- OverlayLayout
- etc.

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# Output Model

- Coordinate systems
  - Device
  - Physical
- Things to know about:
  - Pixels, raster, display size, resolution, video RAM requirements, aspect ratio, dot pitch
- Color models
  - RGB, HSB

# Java's Graphics Features

- Drawing primitives for...
  - Shapes, lines, curves, images, text
- Text characteristics
  - Font family, size, style
  - Font metrics
- Images
  - File formats

# Images

- Images
  - File formats
    - gif, jpg, tiff, bmp
- Drawing images in panels
- Animation user threads
  - Timer class

# Model-View-Controller Architecture

- Model
  - Holds & manages data
- View
  - Implements visual display of data/component
- Controller
  - Maps input into commands

# MVC and Java/Swing

- Know how MVC is implemented in Swing component
  - View & controller combined into UI delegate

# Design for Humans

- SR Compatibility
  - S = Stimulus, the input device that is being manipulated or stimulated
  - R = Response, the visual, aural, or kinesthetic sense that is affected by the stimulus
  - Compatibility refers to the correctness of the match between the stimulus and the response

# Senses

- Of primary concern...
  - Vision
  - Aural
  - Kinesthetic

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# 2D vs 3D Interaction

- Dimensions vs degrees of freedom

# Human Limits and Capabilities

- Bailey's framework



- The two-handed desktop interface lecture...
  - Bimanual control +
  - Handedness +
  - Scrolling =
  - New keyboard design

# Types of Limits

- Sensory (visual/audio intensity/frequency)
- Responder (Fitts' law)
- Cognitive (short-term memory)

# Characteristics of Good UIs

- Consistency
  - Lexical, Syntactic, Semantic
- Feedback
  - Lexical, Syntactic, Semantic
- Use of hierarchy and grouping
- Explicitly shows states and state changes
- Avoids overload

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# Readings

- Java/Swing Tutorial
- MVC article by Fowler
- Java API (Swing components and other classes used in 3461)
- *PowerPoint* slides
- Demo program code and documentation
- Norman, Cooper, Martin chapters

Thank you!