Guidelines, Principles, and Theories

- The state of HCI art has gone way past intuition — though reality does not quite reflect that yet

- Three levels for better-than-intuition, effective interaction design:

    1. Guidelines — very specific rule sets, usually centered on organizations or commercial entities

    2. Principles — middle level of abstraction

    3. Theories — universal notions, capable of being predictive (i.e. "anti-hindsight")

Guidelines for Guidelines

- By far the most heavily-documented; each set of guidelines is an "HCI universe" unto itself

- Well-known guidelines include the *Apple Human Interface Guidelines, Java Look and Feel Design Guidelines*, and *Java Look and Feel Graphics Repository* — links available on the course Web site

- Microsoft publishes a number of guideline books via its paper imprint, Microsoft Press

- This discussion highlights specific tidbits of interest from assorted guidelines documents

Guidelines: Navigation

National Cancer Institute has published a 388-guideline set for Web pages:

- "Standardize task sequences"
- "Ensure that embedded links are descriptive"
- "Use unique and descriptive headings"
- "Use check boxes for binary choices"
- "Develop pages that will print properly"
- "Use thumbnail images to preview larger images"

Guidelines for Accessibility

World Wide Web Consortium (W3C), adapted from US Rehabilitation Act Amendments of 1998

- "Provide a text equivalent for every non-text element"
- "For any time-based multimedia presentation, synchronize equivalent [non-multimedia] alternatives"
- "Ensure that all information conveyed with color is also available without color"
- "Provide a title for every Web frame"

Guidelines: Organization

High-level goals for data display organization (Smith and Mosier 1986)

1. Consistency of data display

2. Efficient information assimilation by the user

3. Minimal memory load on the user

4. Compatibility of data display with data entry

5. Flexibility for user control of data display

Display Guidelines may be Application- or Domain-Specific

…but in the end they share common themes — case in point, a Lockheed set for electric-power control rooms

- Be consistent in labeling and graphic conventions
- Standardize abbreviations
- Use consistent formatting in all displays
- Present data only if they assist the operator
- Avoid alphanumeric data when possible
- Present alphanumeric data only when necessary
- Use and maintain high-resolution monitors
- Design in monochrome first, then add color only where needed
- Involve users when developing new displays and procedures

Guidelines: Notification

Wickens and Hollands have proposed techniques for making information stand out (2000):

intensity	inverse video
marking	blinking
size	color
fonts	audio

Caveat Notificator!

Notification is an area where tradeoffs may occur:

- Boy-who-cried-wolf syndrome — overuse of attention-grabbing techniques may "dull" the user's awareness…or, at the very least, irritate or annoy the user

- Similar formatting implies relationships among similarly formatted items

- Sound saves display real estate, and is processed differently by the brain — but, like visual attention grabbers, must not be overdone

Guidelines: Input/Data Entry

- Proper data entry is crucial in some areas — many times, bad data entry results in serious consequences

- Enter Smith and Mosier again, with these goals:
    1. Consistency in data-entry transactions
    2. Minimal input actions by user
    3. Minimal memory load on users
    4. Compatibility between data entry and display
    5. Flexibility for user control of data entry

- User control vs. consistency — a frequent tradeoff

A Story from the Trenches

- Medical informatics seeks to develop effective applications of computing technology to medicine

- When I first started here, everyone was into fancy "visualization" and "integration" of medical data — none of which got wide adoption or use

- When I asked how the data gets into the system in the first place, a frequent answer was "Data entry? The data is already there!"

- In many facilities, "already there" implies the use of mainframe-based terminals or scanned documents