Presentation Design Principles

Grouping, Contrast, Proportion

SWEN-444
Usability Presentation Design Framework

Properties – color, size, intensity, metaphor, shape, …
Presentation Simplicity

- **Remove** whatever *isn’t essential*
- Use a **regular pattern** for elements, limit variation – same font, color, size, ...
- **Combine** element **roles** – e.g., label as a link (affordances?)
- **Balance, symmetry, alignment**
- **White space**
  - Provide white space **margins** around objects to avoid crowding
  - Crowding impacts scanning
  - **Balance** with need to use **screen real estate**
Mapping

• Mapping describes how we **make connections between things**; patterns

Proper mapping can increase the usability of an interface

![Stove Top](image)

What is the best mapping of the controls?
Mapping

• Mapping describes how we make connections between things; patterns

Proper mapping can increase the usability of an interface

Arbitrary

Arbitrary improved

Natural

Stove Top

Use natural mapping whenever possible
Grouping: Gestalt Principles of Perception

• Gestalt psychology strives to explain the factors involved in the way we group things:
  
  – Perception of the environment as whole entities even without complete information
  – Distinguish foreground objects from background
  – The viewer looks for the simplest solutions even when visually information is incomplete

“Gestalt psychology tries to understand the laws of our ability to acquire and maintain meaningful perceptions in an apparently chaotic world. The central principle of gestalt psychology is that the mind forms a global whole with self-organizing tendencies.” Wikipedia
FIGURE 15.

Gödel Escher Bach: An Eternal Golden Braid
M. C. Escher (1898-1972)
Reversing Staircase

Hering Illusion
A Bongard problem is a kind of puzzle invented by the Russian computer scientist Mikhail Moiseevich Bongard, probably in the mid-1960s.
Grouping

• Gestalt perception principles are useful to guide the placement and organization of screen elements; e.g., icons, structure menu items

  • Proximity
  • Similarity
  • Common Fate
  • Closure
  • Good Continuity

  • Area
  • Symmetry
  • Surroundedness
  • Prägnanz
Gestalt Principles of Perception

• **Proximity Principle** – Objects that are **close** to each other will be seen as **belonging together**

Equidistant  Horizontal Proximity  Vertical Proximity
Gestalt Principles of Perception

• **Proximity** - Adobe PhotoShop Preferences Dialog
Gestalt Principles of Perception

• **Similarity Principle** – Objects that have similar visual characteristics, such as size, shape or color will be seen as a group and therefore related

Columns of Similar Objects
Gestalt Principles of Perception

- **Common Fate Principle** – Objects that move together (beginning, direction, end) are seen as related.
Common Fate Metaphor
Gestalt Principles of Perception

- **Closure Principle** – We tend to see things as complete objects even though there may be gaps in their shape.

- **Good Continuity Principle** – We tend to see things as smooth, continuous representations; e.g., tendency to perceive a line continuing its established direction.
Gestalt Principles of Perception

• **The Area Principle** – Objects with **small area** tend to be seen as the figure, not the (back)ground (also called the smallness principle)
Gestalt Principles of Perception

• **Surroundedness Principle** – An area that is surrounded will be seen as the **figure** and the **area that surrounds** will be seen as the **ground**
Gestalt Principles of Perception

- **Prägnanz Principle** – we tend to **order** our **experience** in a manner that is **regular, orderly, symmetric, and simple**
  - An **overarching principle** evolved from the combination and interaction of the other principles
  - Avoid conflicts of principles

Similarity vs. common fate or surroundedness perception
Contrast

• **Visual stimulus via contrast** – we perceive **visual differences** of an object **before** its meaning

1 3 5 7
2 4 6 8
7 5 3 1
4 6 6 2

• **Visual variables** – visual dimensions of perception
  – Selective – **single value** of the variable can be **distinguished** in the visual field – **locate at a glance**
Contrast

- Find all letters on the left
- Find all red letters
- Find all K’s
- Easiest, hardest?
Contrast in Design

• Choose **appropriate** visual variables
• Use **as much range as possible** (e.g., small to large)
• Variable **values** that make distinctions **obvious**
• **Multiple variable reinforcement**; e.g., bold and color
• Use the squint test
**Proportion**

- **Proportion** – relative size
  - E.g. – heading element hierarchy (this slide!)
  - **Golden ratio** – found in nature, pleasing visual proportions
    \[ \varphi = 1.618 \]