Perceptual Organization and Visual Design

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Outline
- Perceptual Organization: Theory
- Gestalt Laws
- Transparency
- Summary
Perceptual Organization

- How all the bits and pieces of visual information are structured into the larger units of perceived objects and their interrelations
- Objects are extracted from patterns of features

Perceptual Organization

- Early feature abstraction stages
  - Primitive elements—visual image analysis
  - Parallel processing of the entire image

- 2D pattern perception stage
  - Contours—visual image into regions
  - Structures—connections between parts
  - Serial processing of smaller amount of objects
Proximity

- Things that are close together are perceived as grouped together

It is hard to find things if they are not spatially grouped
Proximity

Better Design

Proximity

Even better design
Proximity

- Study shows that labelled visual hierarchies can be searched much more efficiently than unlabelled visual hierarchies

<Visual Search and Mouse-Pointing in Labelled versus Unlabelled Two-Dimensional Visual Hierarchies, HORNOF, TOCHI 8(3), 2001>

Similarity

- Similar elements tend to be grouped together
  - Colour
  - Size
  - Orientation
Similarity

- When displays are the same, make them look the same
- When displays are different, make them look different

Similarity

- Microsoft Calculator (Windows 2000)
  - Which are the operators (+, -, x, sqrt, %)?
  - Which are the operands (1, 2, 3...)?
Similarity

- Better design
- Can easily distinguish operators and operands

Continuity

- More likely to perceive visual element as smooth and continuous, than with abrupt changes
Continuity

- Continuity may be the reason behind the rule of **alignment**
  - Alignment refers to items on a page being lined up with each other
  - Effective alignment makes multiple lines of text easier to read, and easier to search

Continuity

- Left alignments are usually better
Continuity

- Centred alignment provides visual balance, but is less visually strong

Closure

- Closed contour tends to be seen as an object
Closure

- Basis for multi-document interfaces

Closed contour divides region into “inside” and “outside” -> works to enhance proximity

- Usually a good idea to group related displays using frames
Figure/Ground

- Due to all Gestalt laws, and textual segmentation
- Vase or Faces?

Figure/Ground

- Effectiveness depends on
  - Surroundedness
  - Size
  - Orientation
Figure Ground

Effectiveness depends (cont’d):
- Concavity
- Contrast
- Symmetry
- Parallelism

Figure/Ground

- More attention paid to dialog boxes
Figure/Ground

- In small screen displays, things may not be that obvious...
  - Surroundedness
  - Size
  - Contrast

Guideline for Pocket PC 2002: Minimize the use of floating dialog boxes
Figure/Ground

- Text or picture?
  - The “Hallmark moments” in web page design...

Perception of Transparency: Overlapping Data

- One layer over another
- Problems
  - Interference between the overlapped layers
  - Fusion of layers—which is which?
- Requires
  - Good continuity
  - Adequate contrast
Transparency

- Innovative way to overcome screen size constraint in small devices?
- Visual design in small devices
  - Small screen size: 6cm x 6cm
  - Low resolution: 1/15 – 1/10 of desktop
    -> Cannot display a lot of information

Transparency

- Transparency can use screen real estate more effectively
- E.g.: Overlapping semi-transparent “widgets” and text

<Using Small Screen Space More Efficiently, KAMBA, CHI 96>
**Transparency**

- Applying the idea of semi-transparent “widgets” to a small-device online library catalogue

**Summary**

- Gestalt Laws are very useful in visual design
Summary

- Insights in perception organization may lead to innovative ways in visual design