

PUI – Prototyping Lab

Fall 2013

Human Computer Interaction Institute

Carnegie Mellon University

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Overview

- When to prototype?
- How to prototype?
- Part Two
 - Visual Perception & Interface Design



Why prototype?

- Prototyping can help estimate complexity
- Usability testing ensures it is a worthwhile (or better) decision
- Informs a cost vs. benefit decision
- Demonstrate your idea



When to prototype?



When to prototype

- Brainstorm different representations
- Choose a representation
- “Rough out” interface
- Task-centered walkthrough and redesign
- Fine tune interface, screen design
- Heuristic evaluation and redesign
- Usability testing and redesign
- Limited field testing
- Alpha/Beta tests



When to prototype

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Early Design
Low fidelity



Late
High fidelity



How to Prototype

- A series of screen sketches (paper)
- A cardboard mock-up
- A storyboard, i.e. a cartoon-like series of scenes illustrating key points of a scenario
- A PowerPoint Slide show
- A video simulating the use of a system
- A piece of software with limited functionality written in the target language or in another language



Paper/Cardboard

- Pro
 - Readily available
 - Easy to manipulate
 - Scissor, tape

- Con
 - Clearly fake
 - Falls apart



Low-fi Prototypes

- Traditional methods take too long
 - Sketches->beta version->evaluate->iterate
- Can simulate the prototype
 - Sketches->evaluate->iterate
 - Sketches are the prototypes
 - Designer “plays computer”
 - Other design team members observe and record
- Purpose
 - Flesh out competing representations
 - Elicit user reactions
 - Elicit user modifications / suggestions
 - Clients don't fixate on look and feel, but rather functionality



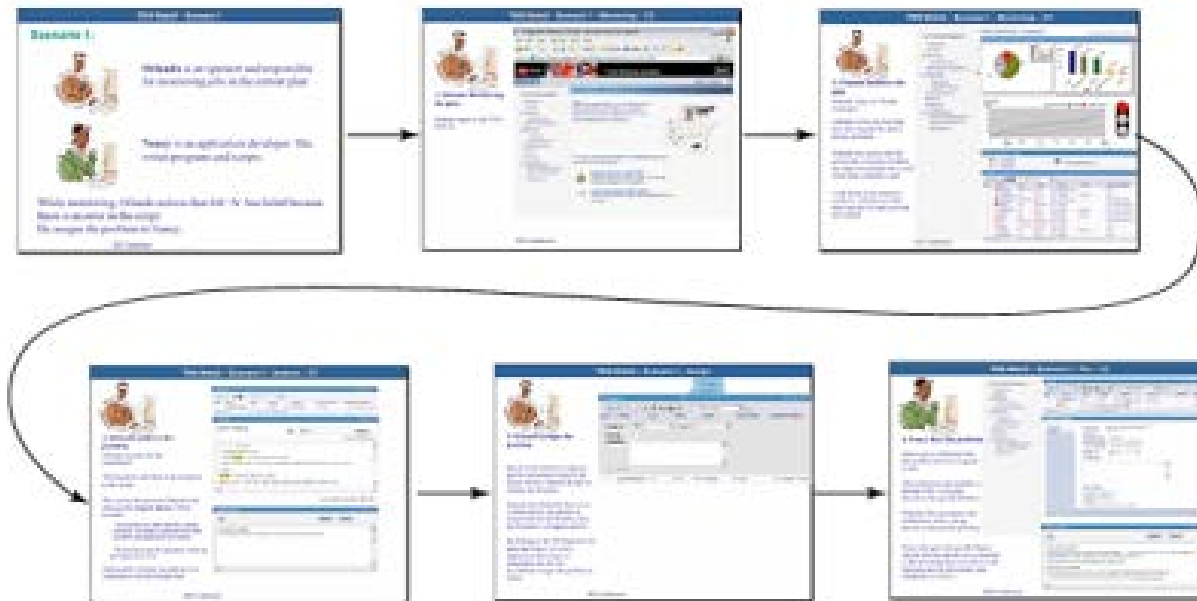
Paper/Cardboard

- Sketching is important to low fidelity prototyping
- Don't be inhibited about drawing ability
- Practice simple symbols
- Develop your own symbols and icons



Storyboard

- A series of “key” frames
 - Used in film to get idea of a scene
 - Snapshots of the interface at important points in the interaction



Powerpoint

- Great for slightly higher fidelity prototypes
- Graphics, logos
- Easily updatable, sharable



Webpages

- Slightly higher fidelity prototypes...
- Graphics, logos
- Easily updatable, sharable



Flex

- Slightly higher fidelity prototypes...
- Graphics, logos
- Easily updatable, sharable



Questions?



Overview

- When to prototype? & How to prototype?
- **Visual perception & Interface design**





Store

Mac

iPod

iPhone

iPad

iTunes

Support



iPhone 5 (S)

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Design

Built-in Apps

App Store

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iPhone 5 (S)

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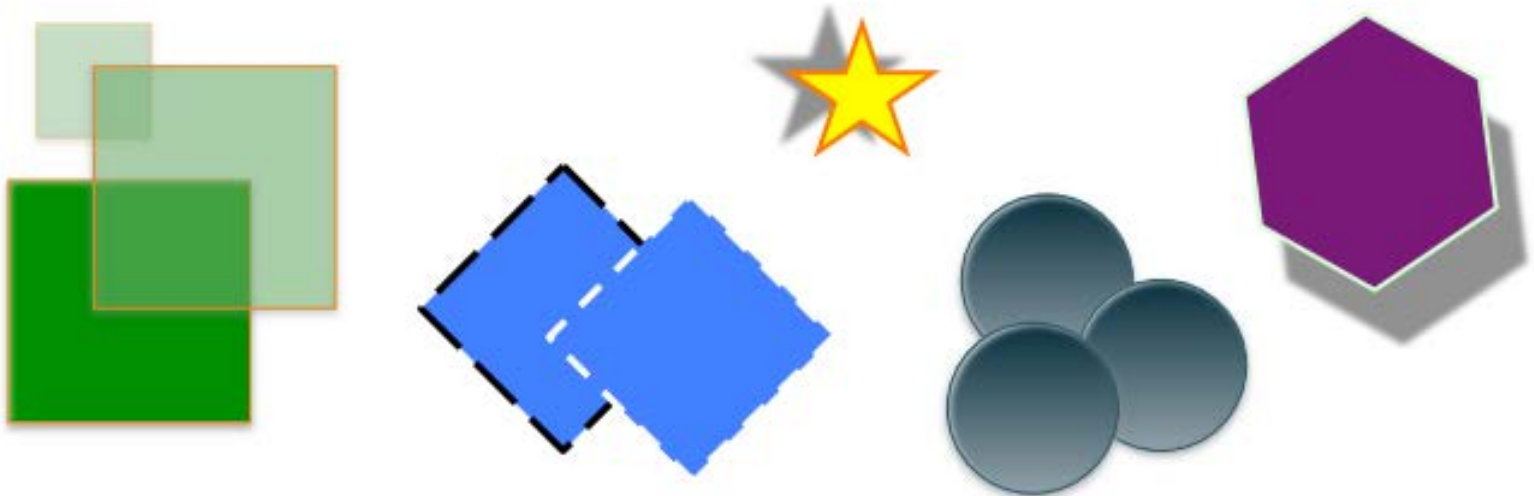
Education

Movies



Vision & Perception

- High bandwidth
 - Color, shape, size, orientation, ordering...



Vision & Perception

- Fast
 - Can glance 10 milliseconds
 - Extract information quickly and reliably



- A wrought-iron structure erected for the World Exhibition of 1889. With a height of 984 feet (300 m), it was the tallest man-made structure for many years.

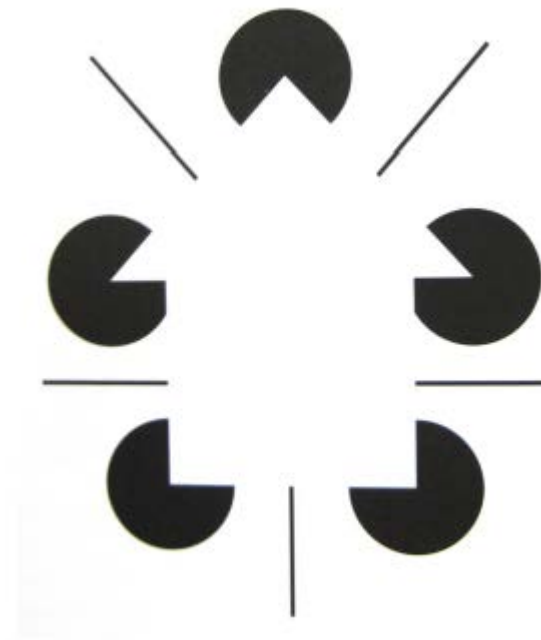
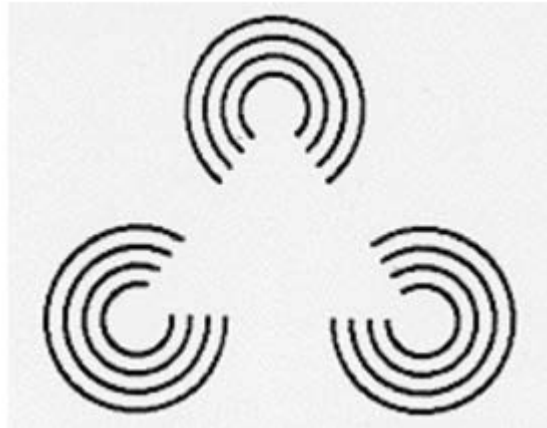


<http://middlezonemusings.com/wp-content/uploads/2007/03/eiffel-tower.jpg>

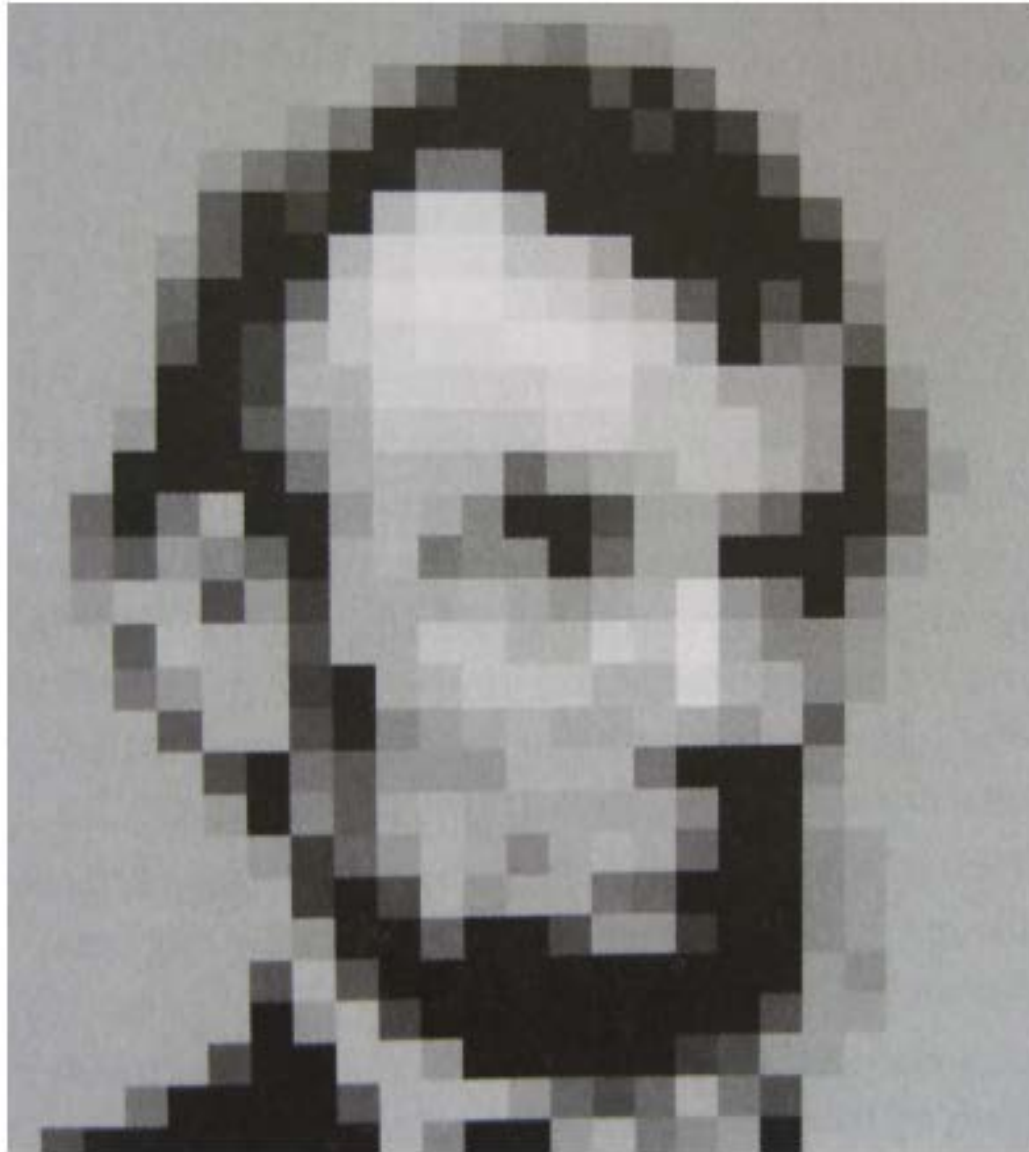


Vision & Perception

- Fill in missing information



Wolfe, 2006



Wolfe, 2006



Vision & Perception

- Highly parallel
 - Can simultaneously process entire field of vision



Car

Boat

Load

Scramble

Fix

Tie

Jump

Swing

Build

Art

Truck

Run

Drive

Yield

Large

Pickle

Germany

Flight

Cat

Wing

Numbers

Keyboard



Car

Boat

Load

Scramble

Fix

Tie

Jump

Swing

Build

Art

Truck

Run

Drive

Yield

Large

Pickle

Germany

Flight

Cat

Wing

Numbers

Keyboard



Information Visualization

- Information Visualization
 - Leverage perceptual strengths
 - Increase information density
 - More data at same level of visual complexity
 - A picture is worth a thousand words



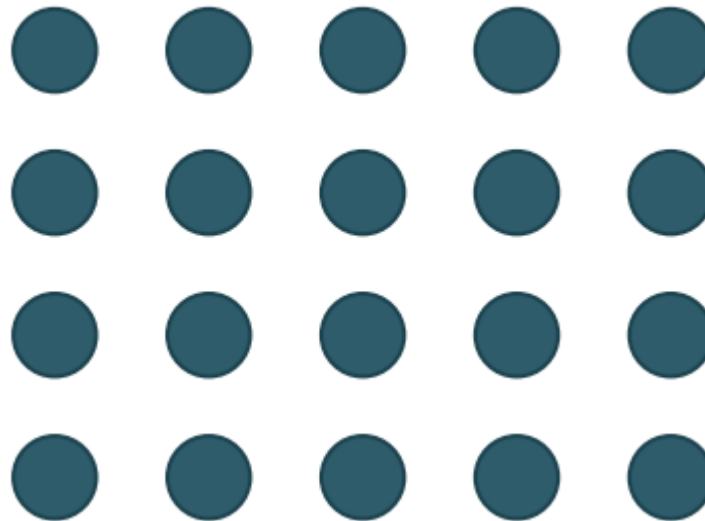
Information Visualization

- Visualize large data sets
 - Scan over data quickly
 - Analyze several dimensions simultaneously
 - Reduces short term memory burden
 - Find complex trends, relationships, patterns ...



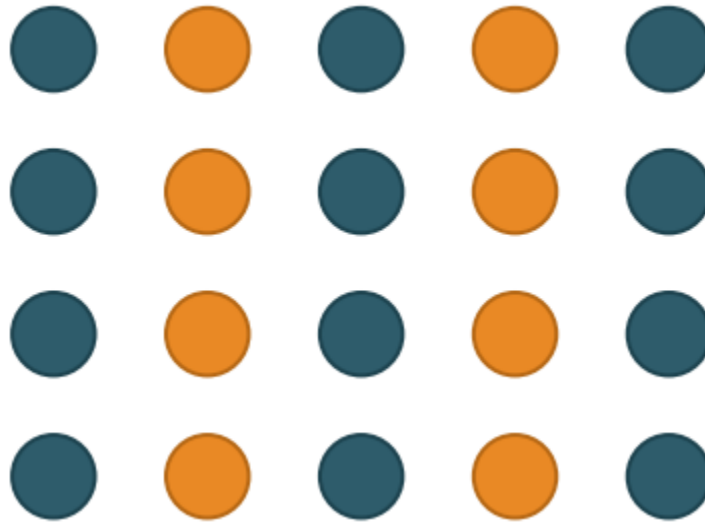
Gestalt Grouping Principles

- Binding and grouping information



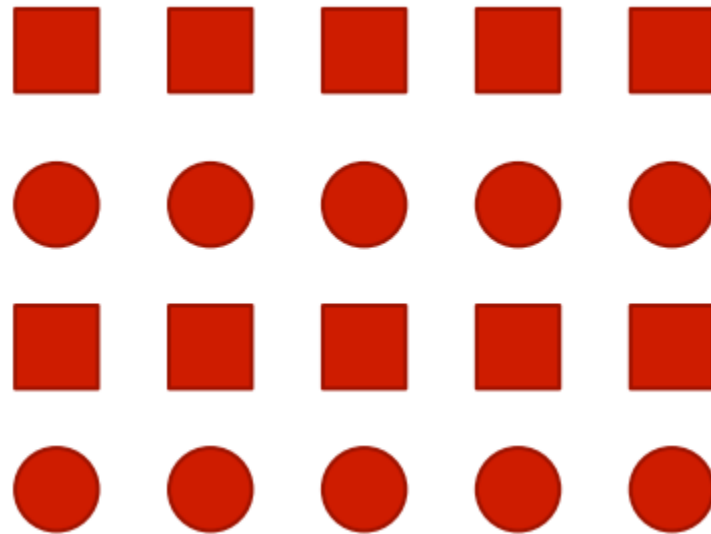
Gestalt Grouping Principles

- Similarity



Gestalt Grouping Principles

- Similarity



Gestalt Grouping Principles

- Proximity



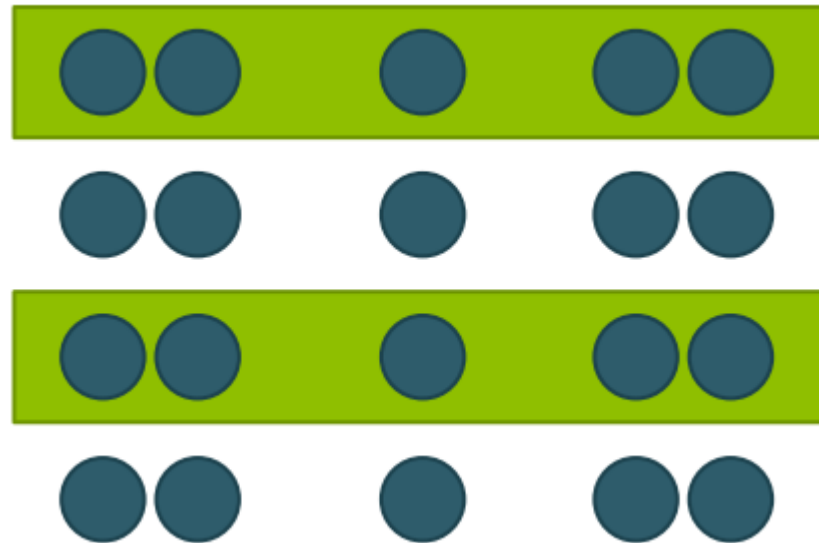
Gestalt Grouping Principles

- Proximity



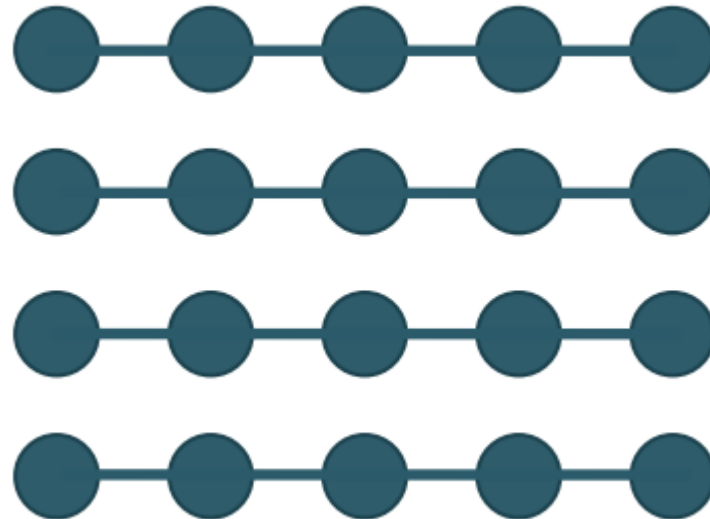
Gestalt Grouping Principles

- Common Region



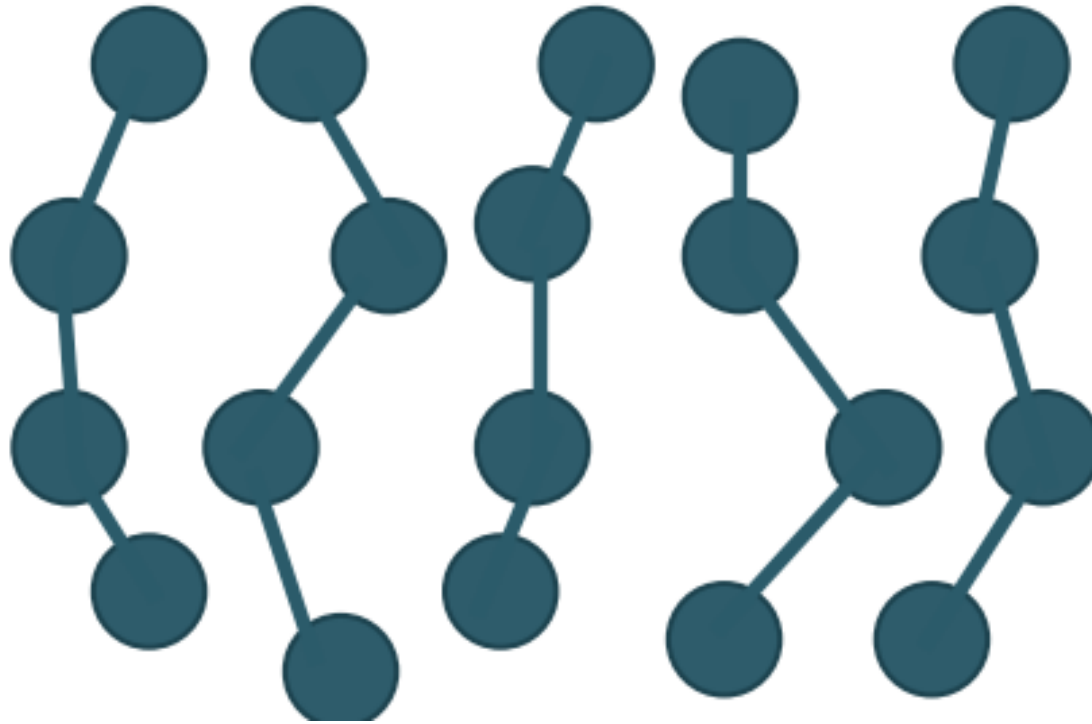
Gestalt Grouping Principles

- Connectedness



Gestalt Grouping Principles

- Connectedness



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Questions?

