

USER INTERFACE DESIGN + PROTOTYPING + EVALUATION

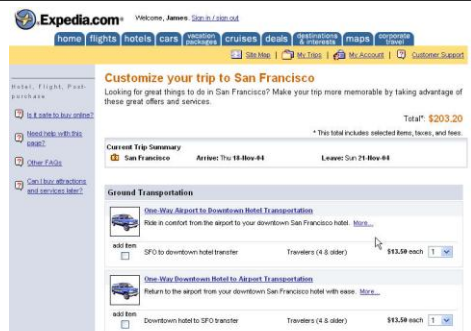
# Visual Information Design

Prof. James A. Landay  
University of Washington

Autumn 2012

*\* Includes material from Skip Shelly, Edward Tufte, Kevin Mullet, & Scott Klemmer*

## Hall of Fame or Shame?



Expedia.com

home flights hotels cars vacations cruises deals restaurants & events maps airports

San Francisco

Customize your trip to San Francisco

Looking for great things to do in San Francisco? Make your trip more memorable by taking advantage of these great offers and services.

Total\* \$203.20

\* This total includes selected items, taxes, and fees.

Current Trip Summary

San Francisco Arrives Thu 18-Nov-04 Leaves Sun 24-Nov-04

Ground Transportation

One-Way Airport to Downtown Hotel Transportation

Rate in context from the airport to your downtown San Francisco hotel. [More...](#)

add item

SFO to downtown hotel transfer Travelers (4 & older) \$13.58 each

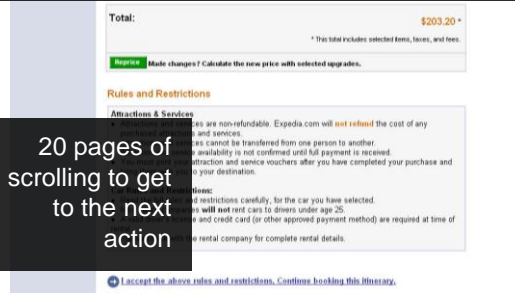
One-Way Downtown Hotel to Airport Transportation

Return to the airport from your downtown San Francisco hotel with ease. [More...](#)

add item

Downtown hotel to SFO transfer Travelers (4 & older) \$13.58 each

## Hall of Shame!



Total: \$203.20

Made changes? Calculate the new price with selected upgrades.

Rules and Restrictions

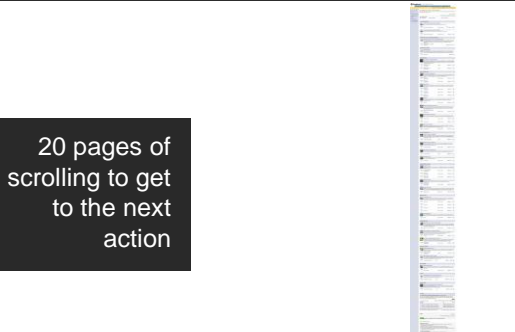
Attractions & Services

20 pages of scrolling to get to the next action

Accept the above rules and restrictions. Continue looking this itinerary.

Cancel and view itinerary.

## Hall of Shame!



20 pages of scrolling to get to the next action

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# Visual Information Design

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## Outline

- Review Prototyping
- Simplification
- Small Multiples
- Typography & Grid systems
- Things to Avoid
- Color
- Proportion & Scale
- Design economy
- Visualization

## Prototyping Review

- Prototypes are a concrete representation of a design or final product
- Low-fi testing allows us to?
  - quickly iterate
  - get feedback from users & change right away
- Problems with lo-fi testing?
  - computer inherently “buggy”
  - timings not accurate
  - some widgets hard to recognize as sketches
  - dynamic behaviors hard to simulate

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## Quotes: Mullet and Sano

“Design is not something that can be applied after the fact, when the fundamental organization of the product has already been determined—though this is indeed a common misconception. To be effective, design must be an integral part of the product development lifecycle.”

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## Quotes: Mihai Nadin

“Method helps intuition when it is not transformed into dictatorship. Intuition augments method if it does not instill anarchy. In every moment of our semiotic existence, method and intuition complement one another.”

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## How Might We Improve This?

You're invited to Zelda's 30th Birthday Party! Please come dressed as your favorite Gilbert and Sullivan character. Children are welcome. Dinner will be served; if you'd like to bring food, call Stacy at 555-1212. When: October 20th, at 7:00 PM Where: Zelda's house. If you need directions, feel free to call Zelda and ask. Please RSVP to Stacy by October 10th. See you there!

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## Use whitespace to make groupings obvious

“Some space must be narrow so that other space may be wide, and some space must be emptied so that other space may be filled.”

– Robert Bringhurst  
*Elements of Typographic Style*

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CSE 440 - Winter 2012

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## Can We Do Better Still?

You're invited to

Zelda's 30th Birthday Party!

Please come dressed as your favorite Gilbert and Sullivan character. Children are welcome. Dinner will be served; if you'd like to bring food, call Stacy at 555-1212.

When: October 20th, at 7:00 PM

Where: Zelda's house. If you need directions, feel free to call Zelda and ask.

Please RSVP to Stacy by October 10th. See you there!

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## Use size contrasts to indicate hierarchy

“Information consists of differences that make a difference.”

– Edward Tufte

*Envisioning Information*

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You're invited to

## Zelda's 30th Birthday Party!

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## Quotes: Antoine de Saint Exupery

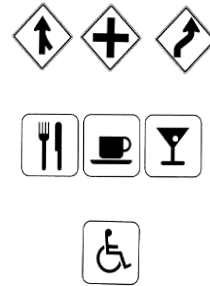
“In anything at all, perfection is attained not when there is no longer anything to add, but when there is no longer anything to take away.”

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## Simplification & Reduction



## Abstraction London Underground



## Small Multiples

- Economy of line
- Similarities enable us to notice differences

Images from Edward Tufte's *Envisioning Information* (removed for copyright)

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### International Women's Day SMALL MULTIPLES

Echeverria, Heriberto 1971  
 March 8 - International Women's Day  
 Cuban Poster Art Gallery, <http://www.sims.berkeley.edu/~lcush/GenCat.html/>

Diaz, Estela 1974  
 March 8 - International Women's Day

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### Reid Miles, Blue Note Cover SMALL MULTIPLES

STEREO  
 THE FIRST IN A SERIES SINCE 1954  
 84041 / BLUE NOTE  
 Freddie Hubbard, Duke Jordan, Sam Jones, Art Taylor  
**TRUE BLUE TINA BROOKS**

Blue Sky and Out, Eternal Blue, Alone Blue, Blue-Hot, Blue Army, True Blue, Love Blue

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### Jan Tschichold's Revolution

- Champion of Modernist Typography

THE NEW  
**TYPOGRAPHY**  
 THE FIRST COMPLETE TRANSLATION  
 OF THE REVOLUTIONARY 1928 DOCUMENT  
 TRANSLATED BY ROBERT D. DINKER  
 INTRODUCTION BY HERBERT A. SIMS

*Die Neue Typographie*  
 Berlin, 1928

Bauhaus school  
 Dessau, 1925-26

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### Type Classifications

- Typeface (Arial) vs Font (Arial Bold)
- Serifs: Structural details in letters that help the reader connect them

	Sans Serif	Serif
	Optima	Fenice Bold
Roman	answ	<b>answ</b>
Obliqued	<i>answ</i>	<b><i>answ</i></b>
True italic	<i>answ</i>	<b><i>answ</i></b>

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### Asymmetric Typography JAN TSCHICHOLD

How blocks used to be arranged in magazines. Schematic, thoughtless centering of blocks (= ugly).

The same blocks, correctly arranged in the same type-area. Constructive, meaningful, and economical (= beautiful).

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### Grid Systems

- A key pattern for implementing rationality, modernism, asymmetry
- Note that no elements are "centered"

Place most important option near the top

Align related options along column guide

Java Look and Feel Design Guidelines

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## Use alignment to guide the eye & reduce clutter

- Avoid slight misalignments; undermine your ability to beacon organization
- And they draw the eye – our perceptual system notices deviations from patterns
- When you deviate from a pattern, do so strategically

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## Icon Design: Differences that Make a Difference



[www.jensondesign.com/1+1=3.pdf](http://www.jensondesign.com/1+1=3.pdf)

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## Administrivia

- Medium-fidelity Interactive prototype due Tue 12/4
  - as much of the final UI as possible
  - much of backend processing or data faked
  - run on phone in web browser (most)
  - use a prototyping tool (we highly recommend JustinMind)
- Presentations 12/4 & 12/6
- Presentations & poster session during final exam slot (Mon 12/10)

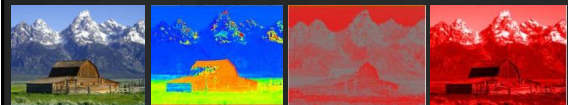
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## Color

- Hue is gradation of colour
- Saturation/purity is intensity of the hue
- Luminance is the brightness in an image



Photo

Hue Saturation

Luminance

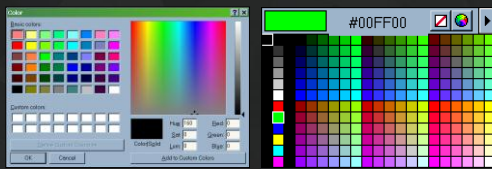
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## Technology-Centered Colors

- Nice Hex codes, “evenly” distributed
- But yowch! Lime green and hot pink?

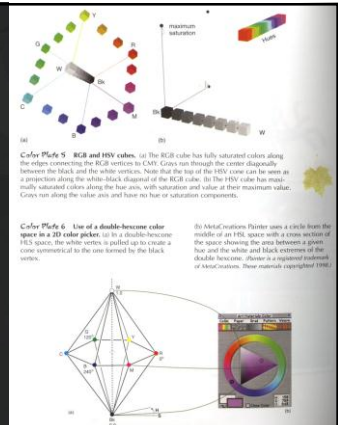


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## Color Spaces



**Color Plate 5** RGB and HSV cubes. (a) The RGB cube has fully saturated colors along the edges connecting the RGB vertices in CMY. Colors run through the center diagonally between the black and the white vertices. Note that the top of the HSV cone can be seen as a perspective along the white-black diagonal of the RGB cube. (b) The HSV cube has maximally saturated colors along the hue axis, with saturation and value at their maximum value. Colors run along the value axis and have no hue or saturation components.

**Color Plate 6** Use of a double-beamer color space in a 2D color picker. (a) In a double-beamer RGB space, the white vertex is pulled up to create a cone symmetrical to the cone formed by the black vertex.

(b) Abbot/Invision Firetree uses a circle from the middle of an HSV space with a cross section of the space showing the area between a hue, and the white and black extremes of the double-beamer cone. (c) Abbot/Invision Firetree uses a circle from the middle of an HSV space with a cross section of the space showing the area between a hue, and the white and black extremes of the double-beamer cone. (d) Abbot/Invision Firetree uses a circle from the middle of an HSV space with a cross section of the space showing the area between a hue, and the white and black extremes of the double-beamer cone. These materials copyrighted 1992.

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## Human-Centered Colors

- Munsell (left): Perceptually based
- Pantone (right): Functionally based

**Color Plate 8** views through the internal color space. The swatches are arranged at perceptually determined brightness positions, but the shape of the space links the geometric components and a color name.

**Color Munsell 3** Color-matching systems. Color naming and printed reference swatches ensure consistent color matching.

Anne Spalter, *The Computer in the Visual Arts*

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## Color: Edward Tufte

IMAGE REMOVED

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## Color: Edward Tufte

IMAGE REMOVED

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## How to get color right

- Design in grayscale first
- Keep luminance values from grayscale when moving to color

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## Scale

**FILM CLIPS**  
 Also opening today

**'RESPIRO'**  
 Drama. Starring Valeria Golino and Francesco Casia. Directed by Emanuele Crialese. (PG-13, 90 minutes. In Italian and Sicilian with English subtitles. At Bay Area theaters.)

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## Proportion and Scale

**52:** Bertin's "retinal variables" form the basis for all forms of visual coding. A visual code can be based on (from left to right) contrasts in size, value, orientation, texture, shape, or position in 2D or 3D space. Hue (chromatic color) provides an additional dimension not pictured here.

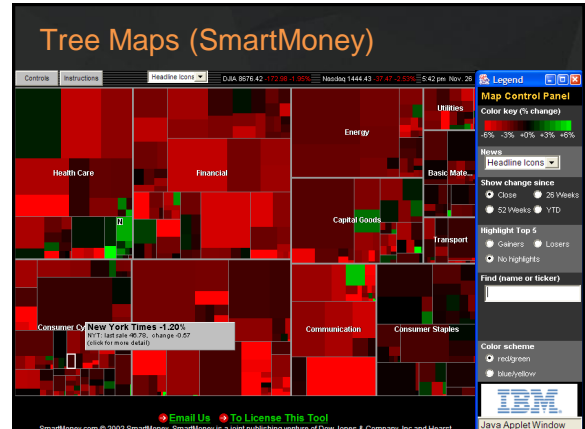
Kevin Mullet and Darrell Sano, *Designing Visual Interfaces*

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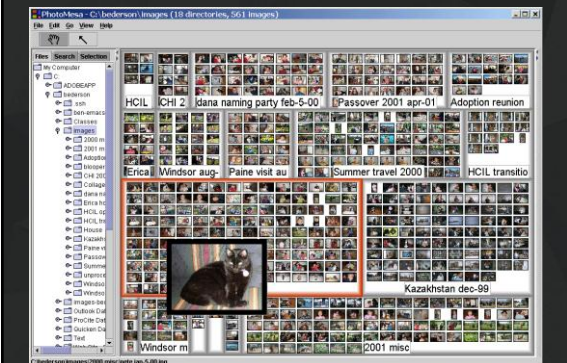
## Visualization

- Tree maps
- Design Galleries

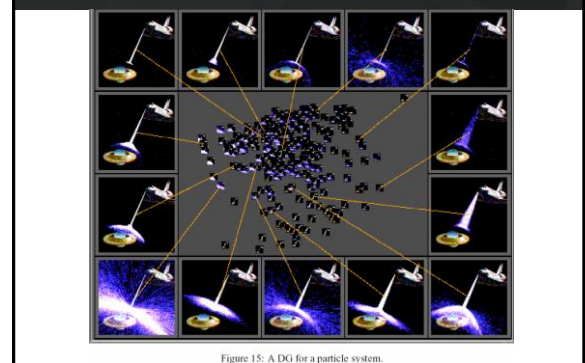
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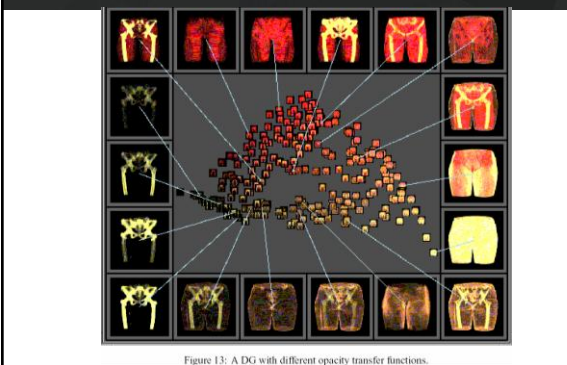
## Tree Maps (PhotoMesa)



## Design Galleries



## Design Galleries



## Some Starting Points

- Gather materials you find...
  - successful
  - contextually relevant
- Could be from a very different domain
  - “Good artists borrow, great artists steal”
  - Picasso
- Include visual design professionals in the iterative design cycle

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## Further Reading

- Kevin Mullet and Darrell Sano, *Designing Visual Interfaces*
- Edward Tufte's books and course
- Anne Spalter, *The Computer in the Visual Arts*
- Robin Williams, *The Non-Designer's Design Book*
- Typography
  - Jan Tschichold, *The New Typography*
  - Robert Bringhurst, *The Elements of Typographic Style*
  - <http://www.adobe.com/type/>

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## Further Reading

- Color: Charles Poynton, *A Technical Introduction to Digital Video*
  - also his SIGGRAPH course
  - web <http://www.inforamp.net/~poynton/>
- Typography on the web
  - <http://www.pemberley.com/janeinfo/latin1.html>
  - <http://www.microsoft.com/typography/>

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## Summary

- Grid systems help us put information on the page in a logical manner
  - similar things close together
- Small changes help us see key differences (e.g., small multiples)
- Abstraction is a key to design
- RGB color space leads to bad colors
- Use color properly – not for ordering!
- Avoid clutter

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## Next Time

- Have a Happy Thanksgiving!
- Tue, 11/27: User Testing
- Read
  - *Appendix A* from *The Design of Sites*
  - [Discussion of guidelines for user observation](#) By Kathleen Gomoll & Anne Nichol
  - optional: [Statistica Ch1](#), & parts of [Ch3](#)
  - optional: [Lewis & Rieman Ch. 5](#)

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