Poster Presentations, Mon May 12!

See the flyer.

Welcome

Welcome to the course Website for i247, Information Visualization and Presentation!

Instructor

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TA

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Course Objectives

The goal of information visualization is the unveiling of the underlying structure of large or abstract data sets using visual representations that utilize the powerful processing capabilities of the human visual perceptual system. Information visualization is an exciting topic, and the last decade has witnessed the development of many interesting ideas about how to visualize abstract information.

In 1998 when I first taught this course, the field was very young, I knew every piece of work that had been done, and the course was a survey of the field. Now the field is very active and a survey a survey or a history of all information visualization techniques would not be feasible nor particularly enlightening.

This course will take a critical stance towards the field of information visualization. Rather than survey existing approaches, we will analyze the factors contribute to success or lack thereof, as a means to determine how to devise future successful visualizations. Criteria for success in this analysis are either positive results from usability studies or wide adoption by the target user population.

This course will also have a focus on how to present information clearly and effectively.

There are many related topics that this class will not address. These include: scientific visualization, cartography, computer graphics, and visualization as an artistic enterprise.

Class Meetings

Class meets on Mondays and Wednesdays from 10:30am-12:00 in 202 South Hall. The format of the class will be a mix of lecturing, looking at visualizations, student presentations and in-class design and activities.

Grading

Grading will be 50% on assignments, readings, and in-class work and 50% on a final project. (See projects from last time for an idea of what they are like.)

Readings and Books

Readings will consist of two required books: Stephen Few's Information Dashboard Design, Tufte's The Visual Display of Quantitative Information, and a number of papers that will be accessible online or handed out in class. You can purchase these from the IMSA website.

You can also access Few's book for free on the UC Berkeley SafariU site, but there are a limited number of people who can look at any one book there at one time.

O'Reilly's *Actionscript 3.0 Cookbook* can be read online here.

O'Reilly's *Essential Actionscript 3.0* is also good, but takes longer to get through. Access it online here.

Software

We'll be using the Tableau software package extensively. You will receive a code for accessing it; do not share this with others. It only works under windows, so Mac users will have to dual boot or use a designated lab machine. Access Tableau

Computer Accounts

If you are not an ischool student, see Roberta (roberta@ischool) in 210 South Hall.

Foundations

1. Wed, Jan 23 Introduction

No Readings

2. Mon, Jan 28 Types of Graphs and Visualizations

Readings

- Pages 1-4, 28-33 of Chapter 1 of Colin Ware's *Information Visualization: Perception for Design*, Morgan Kauffman, 2004. (class handout)
- Tableau Tutorial, 0:00-6:00, 25:00-43:00

Assignments

- Download and install Tableau (must be registered for the course)

Links

- (FYI, not assigned reading) "A classification of visual representations", Lohse, Biolsi, Walker, Reuter, *CACM* 1994. pdf
- NYTimes on Climate Change: Cartoon, Photo Illustration, Information GraphicInformation Graphic, Information Graphic Information Graphic, Information Graphic, Combo Information Graphic, Interactive Graphic, Video

2. Wed, Jan 30 Data Types and Graph Types

(public version of lecture)

Readings

- Pages 119-139 in Chapter 6 of Few.
- Pages 9-15 in Introduction and Chapter 1 of Tufte.
- Tableau Tutorial, 43:00-1:06:00

Links

- Cars dataset, adapted from the ASA 1983 dataset. (Version used in class exercise)

3. Mon, Feb 4 Design Choices in Building Basic Graphs

(public version of lecture)

Readings

- *Three Blind Men and An Elephant*, Stephen Few, 2007.

- *Intelligent Design: Introducing Tableau 3.0*, Stephen Few, 2007.

3. Wed, Feb 6 Multidimensional Graphing

Readings

- *Polaris: A System for Query, Analysis, and Visualization of Multidimensional Relational Databases*, Stolte, Tang, Hanrahan, IEEE TVCG 8 (1), 2002.

Links

- UCB Student Employment dataset (csv) for use in class (downloaded from Swivel, purportedly from the UCB Career Center).

Assignment

- Exploratory Data Analysis Due Feb 29th, 9pm.

4. Mon, Feb 11 Guest Lecture: Prof. Agrawala on Line Drive and Effective Assembly Instructions

Readings

- Handout from *Show Me the Numbers* (pp. 75-83), Stephen Few, 2004.
- (Optional reading) Rendering Effective Route Maps: Improving Usability Through Generalization, Agrawala & Stolte, SIGGRAPH 2001.
- (Optional reading) Designing Effective Step-By-Step Assembly InstructionsAgrawala et al., SIGGRAPH 2003.

4. Wed, Feb 13 Graphing and Basic Statistics

(public version of lecture)

Readings

- Pages 140-152 of Few (finish Chapter 6)

Links

- Video: *A Daily Show* rifs on TV media's use of graphics in the primary contest.

5. Mon, Feb 18 No class

President's Day Holiday

5. Wed, Feb 20 Perceptual Properties

Readings

- Pages 79-95 of Few (Chapter 4)
- (Optional) The remainder of the Ware handout

6. Mon, Feb 25 Graphical Excellence

Readings

- Pages 16-43 of Tufte

6. Wed, Feb 27 How to Critique Visual Designs

public version of lecture

Readings

- Pages 96-117 of Few (Chapter 5)

7. Mon, Mar 3 Graphical Integrity

Readings

- Chapter 2 of Tufte (pages 53-77)

Interactive Visualization

7. Wed, March 5 Interactive Visualization

Readings

- The Eyes Have It: A Task by Data Type Taxonomy for Information Visualizations, Shneiderman, Proc. IEEE Conference on Visual Languages, Boulder 1996.
- (optional background) Space-scale diagrams, Furnas & Bederson, CHI 1995.

8. Mon, March 10 Multidimensional Interactive Visualization; Flash Intro 1

Readings

(Read at least one of these)

- Understanding research trends in conferences using PaperLens, Lee et al., CHI'05 extended abstracts. website
- Network Visualization by Semantic Substrates, Shneiderman & Aris, IEEE TVCG 2006.

- Multidimensional Detective, Inselberg, IEEE Infoviz Symposium, 1997.
- Stephen Few on Parallel Coordinates, Business Intelligence Network, Sept 2006.
- The attribute explorer, Tweedie et al. CHI 1994.

Links

- PaperLens video
- NVSS video
- Parvis Parallel Coordinates downloadable software (windows)
- Influence (Attribute) Explorer Video

Assignment

- Assignment 2, due Monday March 17 at 9am

8. Wed, March 12 Discuss Class Projects; Flash Intro 2

Readings

- Flash Intro (read Part 1)
- I recommend O'Reilly's book *Actionscript 3.0 Cookbook* which you can read online here.

Assignments

- Follow these instructions to download and install the free Flex SDK

Code Samples

- load_xml/Gui.as
- load_xml/vis_demo.as
- drawing_interaction/vis_demo2.as

9. Monday, March 17 Guest Lecture: Stephen Few on Time Series Analysis

Readings

- Save the Pies for Dessert, Stephen Few.

9. Wed, March 19 Animation

Readings

- Animation: From Cartoons to the User Interface Bay-Wei Chang, David Ungar, UIST 1993.
- Animated Exploration of Graphs with Radial Layout, Ping Yee, Danyel Fisher, Rachna Dhamija, and Marti Hearst, in IEEE Infovis Symposium, San Diego, 2001
- (optional) Animation: Does It Facilitate? Barbara Tversky, Julie Morrison, Mireille Betrancourt, International Journal of Human Computer Studies, v57, p247-262. 2002.

Assignment

- Project proposals assigned, due Wed April 2 at 9am

Code

- I wrote actionscript 3.0 code to simulate this visualization from the NYTimes.Try it! Here is the code (with animation bug fixed): ShowWordTrends.as

  Next on my list is this more elaborate one.

Monday, March 24 and Wed March 26 No class

Spring Break Holiday

10. Monday, March 31 Guest Lecture: Jeff Heer on Programming Flare plus Social Visualization

Readings

- Flare Intro (read Part 2)
- (optional) Vizster: Visualizing Online Social Networks, Heer and boyd, InfoVis 2005.

10. Wed, April 2 Visualizating Networks

Readings

- (optional) Graph Visualization and Navigation in Information Visualization: A Survey, Herman, Melanon, and Marshall, IEEE TVCG 2000.

Assignment

- Project proposals due

11. Mon, April 7 Visualization for Search

Readings

- Pages 3-28, Information Visualization Chapter for Modern IR II, by Marti Hearst

11. Wed, April 9 Visualization for Text Analysis, plus Tag Clouds

Readings

- Pages 28-53, Information Visualization Chapter for Modern IR II, by Marti Hearst

12. Mon, April 14 Distortion Techniques

Readings

- (Work on projects instead of readings)

13. Wed, April 16 3D in Visualization

Readings

- (Work on projects instead of readings)

  Links

  Maneesh Agrawala's lecture on visualizing in 3D

Class Projects

13. Mon, April 21 Mid-Project Reviews

Presentation schedule:

- Joshua (Communications spectrum)
- Kathleen, Jill, & Aylin (Visualizing the Farm Bill)
- Nick, Shawna, and Jon (Visualizing the Charity Sector)
- Ruchi, Deepti, & Ani (Visualizating aAqua)

13. Wed, April 23 Mid-Project Reviews

Presentation schedule:

- Srini, Ethan, Anu, Beat (The VAST challenge)
- Devin (Bookshelf visualization)
- Ashkan & Diane (Digg subject matter)
- Srikanth, Isaac, & Xioameng (Digg latent social networks)

14. Mon, April 28 Recent Research from CHI 2008

14. Wed, April 30 Course Recap; Interesting Viz's

Music Viz Links

- Music Arcs

- Improviz
- Music Animation Machine

Other Interesting Links

- Flowing Data
- Twitter 17 ways
- Infoviz blog

15. Mon, May 5 Final Project Presentations

- Srikanth, Isaac, & Xioameng (Digg latent social networks)
- Ashkan & Diane (Digg subject matter)
- Devin (Bookshelf visualization)
- Srini, Ethan, Anu, Beat (The VAST challenge)
- Kichul (Pattens of Wind in Architecture)

15. Wed, May 7 Final Project Presentations

- Ruchi, Deepti, & Ani (Visualizating aAqua)
- Nick, Shawna, and Jon (Visualizing the Charity Sector)
- Kathleen, Jill, & Aylin (Visualizing the Farm Bill)
- Joshua (Communications spectrum)

Reminder: Final project writeup due Sat May 10 at 9am

16. Mon, May 12 Project Poster Session

- Poster presentations in Room 202. See the flyer.