E 120 Data Visualization Projects
Caltech, third term 2012-2013, 6 units (3-0-6)
Mondays, 7pm - 9pm, Location TBD

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COURSE DESCRIPTION:

This course will provide students with a forum for discussing and working through challenges of visualizing students' data using techniques and principles from graphic design, visual art, and visual practices in science and engineering. Working together, we will help create and edit students' graphics and other visual forms of data to improve understanding. We will consider the strengths and weaknesses of communicating information visually in drawing, design and diagramming forms such as flow charts, brainstorming maps, graphs, illustrations, movies, animation, as well as public presentation materials, depending on the needs of students' projects. Our approach will be derived from design principles outlined by Edward Tufte and others. The course is targeted towards students across disciplines using visual display and exploration in research. There is no pre-requisite, but students should be competent in acquiring and processing data.

ASSIGNMENTS

Redesign and Software Exercises

2-3 short re-designs of existing visual displays of data
1-2 software tutorials

Project

This is an opportunity to focus on creating and refining visualizations of your data with the mentorship of visual art and design experts. Ideal projects are those that already have data sets that may benefit from creative design-informed visualization approaches involving interactivity and still design formats. Clear, well defined problems with tangible outcomes that may be achieved within the limits of the term are most appropriate. However, shorter and longer-term projects may also be developed.

Students will create your own data visualizations using technologies you choose. Students will be responsible for acquiring and processing their own data as well as designing and fabricating their own projects.
1. Write an approximately 500 word proposal
2. Create informal design concept sketches
3. Loosely outline production plans
4. Produce project

REQUIRED BOOKS
TBD

References
• Edward Tufte's books:
 The Visual Display of Quantitative Information
 Envisioning Information
 Visual Explanations: Images and Quantities, Evidence and Narrative
 Beautiful Evidence
• Visual Strategies: A Practical Guide to Graphics for Scientists and Engineers, Authors Felice C. Frankel
 and Angela H. DePace
 Book and web site http://visual-strategies.org
• Fernanda Viegas and Martin Wattenberg's web site http://hint.fm
• Flowing Data web site http://flowingdata.com/category/tutorials/

• Colin Ware's books:
    Information Visualization: Perception for Design
    Visual Thinking: for Design

REQUIRED PROJECT MATERIALS
Students will determine the materials needed for their projects. Students will be responsible for obtaining their own materials.

Sketch paper
graph paper

GRADES
Pass/Fail
Your final course grade will be based on the following percentages:

15	Exercises
75	Project
10	Class Participation
100	Total

SCHEDULE (Topics TBC)

4/1   Week 1
Introduction to the course,
Lecture/discussion: Basic kinds of data visualization, basic design principles for visualization
Homework: Re-design exercise #1

4/8   Week 2
Lecture/discussion: Forms of data visualization and their functions
HW: Re-design exercise #2

4/15   Week 3
Lecture/discussion: Visualization design processes: From sketching to story telling
HW: Get to know your way around software

4/22   Week 4
Lecture/discussion: Software tools and techniques
HW: Project proposal: 500 words and concept design sketches

4/29   Week 5
Lecture/discussion: Project workshop: Defining goals and visual forms
HW: Project development and production

5/6   Week 6
Lecture/discussion: Project workshop: Review and refine
HW: Project development and production

5/13   Week 7
Lecture/discussion: Project workshop: TBD
HW: Project development and production

5/20   Week 8
Attend JPL-Caltech-Art Center visualization summit -- Making Meaning: From Data to Design 5/23-24
HW: Project development and production

<u>5/27   Week 9</u>
Lecture/discussion: Project workshop: TBD
HW: Project development and production

<u>6/3   Week 10</u>
Lecture/discussion: Project presentations