

Independent study, Web-based Data Visualization
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Background

In the past I have studied Visualization (in a graduate seminar course in 1996, with Prof. George Furnas, at the University of Michigan) and its history in the context of access to information and information retrieval. As a practitioner I have created a number of visualizations on the public web of small-to-medium sized data sets, such as simple time series data (<http://tinyurl.com/cts2010>), a hierarchical vocabulary browser (<http://www.flickr.com/photos/dchud/354689519/>), a boolean search interface (<http://www.flickr.com/photos/dchud/354686520/>), and many typically modest summaries of patterns in larger data sets. This training and experience, plus my facility as a programmer with many years of experience in web development techniques and standards, should make me capable of self-study in this area.

Learning Objectives

- Develop a solid foundation in publishing data analysis narratives on the web using contemporary free and open source tools
- Learn how to build complex, interactive web-based visualizations of data analyses
- Learn how to approach the craft of data visualization systematically, building on well-established techniques from experts in design and software disciplines

Activities

- Read three classic texts relating to data visualization, including design theory and software systems
- Learn several popular free and open source tools for publishing data on the web
- Produce and publish a series of progressively sophisticated data visualizations with these tools, informed by the texts, using publicly available data

Texts (likely examples)

- Albers, Josef. *Interaction of Color (iPad Edition)*. New Haven, Conn.: 2013.
- Wilkinson, Leland. *The Grammar of Graphics, 2ed.* Springer, 2005.
- Tufte, Edward R. *The Visual Display of Quantitative Information, 2ed.* Cheshire, Conn.: Graphics Press, 2001.

Tools

- D3.js, popular JavaScript library for publishing data-driven documents using web standards (see <http://d3js.org/>)
- IPython/R notebooks, tools for publishing narrative, code, and visualized data on the web (see <http://ipython.org/notebook.html>)

Timeline

- Weeks 1-2: Read *Interaction of Color*; experiments with color in D3 that replicate concepts and examples taught in text
- Weeks 3-4: Read *The Grammar of Graphics*; experiments with publishing basic matplotlib/ggplot2 charts in IPython/R notebooks that capture/reflect aspects identified in the text
- Weeks 5-6: Read *Visual Display of Quantitative Information*; experiment with publishing visualizations that express increased data/analytics sophistication using D3 as studies for final project
- Weeks 7-8: Develop and publish 2-4 distinct but inter-related visualizations as part of a coherent final project that communicates more complex and subtle aspects of a complete data narrative