Data Visualization (CIS/DSC 468)

Introduction & Data

Dr. David Koop
What is Data Visualization?
How is it different from Computer Graphics?
The purpose of computing is about insight, not numbers

- R. W. Hamming
The purpose of **visualization** is about insight, not **pictures**

- Card, Mackinlay, Schneiderman
Why do we visualize data?
Why do we visualize data?

Why Graphics?

Figures are richer; provide more information with less clutter and in less space.

Figures provide the gestalt effect: they give an overview; make structure more visible.

Figures are more accessible, easier to understand, faster to grasp, more comprehensible, more memorable, more fun, and less formal.

List adapted from: [Stasko et al. 1998]
What are different purposes for visualization?
Exploration
Confirmation
Communication
Communication: Peyton's Records

Why Peyton Manning's Record Will Be Hard to Beat

By GREGOR AISCH and KEVIN QUEALY OCT. 19, 2014

The Broncos quarterback set the all-time N.F.L. touchdown passing record — and is still going strong.

[G. Aisch and K. Quealy, NYTimes]
What is the difference between exploration and communication?
Questions vs. Persuasion
Why is design important?
Design: Focus on only the y-axis

Average Annual Global Temperature in Fahrenheit
1880-2015

[S. Hayward, 2015]
Design: Year on the y-axis

![Graph showing a trend in the year range from 1900 to 2040 with the y-axis labeled Year and the x-axis labeled Year (A.D.).]
Design: Different y-axis

Average Annual Global Temperature in Fahrenheit
1880-2015

[S. Hayward, 2015]
What types of data can we visualize?
Types of Data

- Tables
- Networks (Graphs)
- Spatial Data
  - Geography
  - Medical
- Text
- Sets
Why is interaction important?
What tools do we use for visualization?
Administrivia

• Course Web Site
• Syllabus
  - Plagiarism
  - Accommodations
• Textbook
  - Munzner (required)
  - Murray (available online)
• Assignments
• Exams (2 + Final, 3 Total)
• Registration
  - Add/Drop Deadline **Friday**
Do not cheat!
Do not cheat

- Cheating on assignments, projects, and exams is not allowed
- You will receive a zero on the assignment/project/exam
- It will be reported to the department and university
- If it repeats, you will fail the course
- You can be kicked out of the university
Do ask questions!
Do ask questions

- If you are stuck on a specific issue with an assignment:
  - Do email me with **specific** questions
  - Do consult books, online documentation, tutorials
  - Do discuss that specific issue with a classmate

- If you are asked about a question:
  - Do not share your code
  - If the questioner is trying to cheat, walk away
  - If you see an obvious mistake, kindly point it out
  - Suggest a specific function or library that may be useful
Questions?
Homework

- Read Chapter 1 of Munzner
- Ch. 3 and 4 of Interactive Data Visualization
  - Web, HTML, JavaScript