Interaction
Involving the Viewer

February 21, 2012 – Michael Porath
Where Are We?

Fundamentals
- Data
- Image
- Perception
- Color

Techniques
- Interaction
- Storytelling

Types of visualizations

Assignment 2
Working with data

Assignment 3
Visualizing data set of your choice

Assignment 4
Quantified Self

Final Project
Interactive Visualization Project
Where Are We?

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Types of visualizations

Assignment 2
- Working with data

Assignment 3
- Visualizing data set of your choice

Assignment 4
- Quantified Self

Final Project
- Interactive Visualization Project
Interactive Data Visualization

Graphic Design

Static Visualization

Data Analysis
Interactive Data Visualization

Graphic Design

User Interface Design

Interaction Design

Static Visualization

Data Analysis
Interactive Data Visualization

Graphic Design

User Interface Design

Interaction Design

Static Visualization

Exploratory Data Analysis

Data Analysis
Interactive Data Visualization

Graphic Design

User Interface Design

Interaction Design

Static Visualization

Exploratory Data Analysis

Data Analysis
Why Interaction?
When is (static) representation not enough?
Why Interaction?
When is (static) representation not enough?

Scale

- Too many data points
- Too many different dimensions
Why Interaction?
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Storytelling
Why Interaction?
When is (static) representation not enough?

Scale
- Too many data points
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Exploration

Storytelling
Why Interaction?
When is (static) representation not enough?

- Scale
  - Too many data points
  - Too many different dimensions

- Storytelling

- Exploration

- Learning
User Intent
Or once again: What’s the Objective

Select
Explore
Reconfigure
Encode
Abstract / Elaborate
Filter
Connect

Yi et al, 2007
User Intent
Or once again: What’s the Objective

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Yi et al, 2007
1. Select / Focus

Mark something interesting
1. Select / Focus

Technique
1. Select / Focus

Technique
1. Select / Focus

Technique
Example
US Presidents Job Approval Ratings

good

bad
Example
US Presidents Job Approval Ratings

Pick a detail from a larger dataset to keep track of it.

http://www.clusterize.com/comparisons/5-us-presidents-job-approval-ratings
2. Explore
Show something different
2. Explore
Technique
2. Explore

Technique
Example
NY Times: Mapping America

Overcome limitations of display size

San Francisco

New York City

3. Reconfigure

Show a different arrangement
Example

Hollywood Data Explorer: Changing Axes

http://indexity.net/vis/hw/
4. Encode
Show a different representation
Example
D3.js stacked / grouped bars

Change visual/retinal variables

- Colors
- Sizes
- Orientation

- Font
- Shape

5. Abstract /

Elaborate

Show more or less detail
5. Abstract / Elaborate
Special Technique: Focus & Context
5. Abstract / Elaborate

Special Technique: Focus & Context

**Rank: 1**

School of Information
UC Berkeley
Students: 125
Example
Manifest Destiny (shameless plug by yours truly)

http://michaelporath.com/projects/manifest-destiny/
6. Filter
Show something conditionally
San Francisco Crimespotting

Change the set of data items presented based on some condition

http://sanfrancisco.crimespotting.org
Example

Keystroke filtering in NameVoyager

http://www.babynamewizard.com/voyager
7. Connect

Show related items
7. Connect
Special Technique: Brushing & Linking

Graph: Scatter plot showing relationship between MPG and Weight.

Graph: Line chart showing relationships between MPG, Weight, Horsepower, and Cylinders.
7. Connect

Special Technique: Brushing & Linking
Example
OECD Regional eXplorer

Multiple views of same data

Selecting or highlighting in one case generates highlighting in another

http://stats.oecd.org/OECDregionalstatistics
Interaction vs Representation

Static representation, that is.
Analysis – Communication

Interaction has an exploratory aspect

Explore
Connect
Filter
Reconfigure
Encode
Select
Abstract/Elaborate

Analysis

Communication

Exploratory
Explanatory
So you wanna use interaction?

Nail?
So you wanna use interaction?

Nail?
So you wanna use interaction?

= Interaction
Many Visualizations out there
Many Visualizations out there

Now with 4x more interaction!
The Process

What Data?
Field of Interest

Find a story
Data Exploration
Data Aggregation
Data Mashups

User Intent?
Choose representations
Add interaction – Sparingly.
Examples
What’s the user intent? Which technique?
512 Paths To The White House
NY Times

Example
Keystroke filtering in ZipDecode

http://benfry.com/zipdecode/
Bloomberg Billionaires

Today's ranking of the world's richest people

Net worth (rankings) as of March 4, 2013

Total wealth of all billionaires: $2T

1. Slim
2. Gates
3. Ortega
4. Buffett
5. Kamprad
6. Koch
7. Koch
8. Ellison
9. Walton
10. Walton
11. Walton
12. Walton
13. Bettencourt
14. Li
15. Arnault
16. Alwaleed
17. Persson
18. Bezos
19. Adelson
20. Albrecht

http://www.bloomberg.com/billionaires
Scatter States

http://hyperphor.com/election/scatterstates.html
Recap
Announcement
Assignment 4

**Task** Construct a *narrative* about yourself, telling from the data you’ve collected

**Deliverable** Sketches/Iteration, Final Visualization and Writeup

**Due** Tuesday Mar 19, 3:00PM

More information on the class blog
Lab Thursday
D3.js; Part II
Next Lecture
Storytelling