Required Readings

Chapter 6: Multiple View Methods

Further Reading


Multiple View Methods

- linking/coordination choices
- linking highlighted
  - is contiguous in one view distributed in another?
- linked navigation
- view choices
  - encoding: same or multiform
  - dataset: same or small multiple
  - data: all or subset (overview/detail)
  - spatial ordering of views
- many combinations possible

Replace, Replicate, Overlay

- when to do which
- design tradeoffs
  - always replace: too much reliance on memory
  - always replicate: too many windows
  - always overlay: too much clutter in single window

Architectural Issues

- must play nicely with other views
- rendering, preprocessing, responding to commands
- most issues also true for scalability of single view
- guaranteed response time independent of dataset size
- loose confederation
  - multithreaded, each component can work in background
  - tighter confederation: return control to master regularly (TJ,H3)
  - divide work into pieces, enqueue
  - continue serving queue when control is returned

Improvise

- tightly integrated coordination approach
  - components with many external control capabilities
  - live properties
    - value slots, ports
    - change in response to user action
  - naive approaches fall into cycles

Coordinating Axes

- scatterplot from components
  - building up coordination
    - encoding: same or multiform
    - dataset: same or small multiple
    - data: all or subset (overview/detail)
    - background updating of views (upper left dot)
  - list views for search coupled with other multiform views
  - coordination analysis (controls/variables)
  - selection decoupled from data

Critique

- strengths
  - sophisticated and powerful approach to coordination
- weaknesses
  - large learning curve to build new apps

Small Multiples vs Animation


CMV Example: Visual Search Engine

- jae from douvelliis, roberts, and Rodgers, Figure 3 of State of the Art: Coordinated & Multipl for Exploratory Visualization. Roberts. Proc. CMV 2007

CMV Example: cdv

- cdv from dykes, Figure 2 of State of the Art: Coordinated & Multiple Views in Exploratory Visualization. Roberts. Proc. CMV 2007

CMV Example: CommonGIS

- [CommonGIS from Andrienko and Andrienko, Figure 4 of State of the Art: Coordinated & Multiple Views in Exploratory Visualization. Roberts, Proc. CMV 2007]

Coordinating Multiple Scatterplots

- sync horizontal but not vertical scrolling

Example: Complex Application

- building up coordination
  - encoding: same or multiform
  - dataset: same or small multiple
  - data: all or subset (overview/detail)
  - background updating of views (upper left dot)
  - list views for search coupled with other multiform views
  - coordination analysis (controls/variables)
  - selection decoupled from data

Video

- building up coordination
  - encoding: same or multiform
  - dataset: same or small multiple
  - data: all or subset (overview/detail)
  - background updating of views (upper left dot)
  - list views for search coupled with other multiform views
  - coordination analysis (controls/variables)
  - selection decoupled from data

Fig. 6. The data are spatially reaggregated into 4km grid squares. Absolute geographical positioning is employed ... of visual variables. For example...

Critique


Automatic Dotplot Ordering: Trellis

alphabetical, site, variety

use group median


Trellis Structure

conditioning/trellising: choose structure
pick how to subdivide into panels
pick x/y axes for individual panels
main-effects: sort by group median
derived space, from categorical to ordered

HiVE: Conditioning

reconfigure conditioning hierarchies to explore data space
treemaps as spacefilling rectangular layouts
each rectangle is conditioned subset of data
nested graphical summaries
size, shape, color used to show subset properties
ordered by conditioning variables
dimensional stacking:
discretization and recursive embedding of dimensions

HiVE Example: London Property

top split: house type. next: neighborhood. next: time
color: price variance. size: number of sales
resulting patterns:
- between neighborhoods have different house distributions
- within neighborhoods have similar prices

HiVE Example: London Property

top split: neighborhood. next: house type. next: sales
time (year). next: sale time (month)
color: average price. size: fixed
resulting pattern: expensive neighborhoods near center

HiVE Video

Critical

very thoughtful analysis
prescriptive guidelines
references backing up arguments

[Fig. 6: MacEachren et al., Exploring High-D Spaces with Multiform Matrices and Small Multiples. Proc InfoVis 2003, p 31-38.]

[Fig. 3: MacEachren et al., Exploring High-D Spaces with Multiform Matrices and Small Multiples. Proc InfoVis 2003, p 31-38.]

[Fig. 2: MacEachren et al., Exploring High-D Spaces with Multiform Matrices and Small Multiples. Proc InfoVis 2003, p 31-38.]


Chapter 7: Item Reduction Methods