Evaluation, Scalability

Lecture 14 CPSC 533C, Spring 2004
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Evaluation, Scalability

Empirical Comparison of 3 InfoVis Systems

Snap–Together Viz Evaluation

Million–Item Viz

Incremental Dynamic Queries

Comparison of 3 InfoVis Systems

Eureka/TableLens InfoZoom/Focus Spotfire

TableLens problems
- hidden labels, 3+ attribs, correlation
InfoZoom problems
- correlation
Spotfire
- cognitive setup, default scatterplot overuse

Systems Critique

choices difficult, defaults kept

SpotFire
- sticking with default scatterplots
- hard to pick/setup other representation
- stick with representation once chosen

InfoZoom
- sticking with default table
- fail to expand rows, resort, try scatterplots

TableLens
- filtering/grouping strategies hard to pick
- forgot to sort
- didn’t interpret graphs correctly
- report to counter?

Systems Strengths

InfoZoom
- when zooming the right strategy
Spotfire
- when scatterplots/histograms right strategy
TableLens
- when sorting the right strategy

Evaluation Critique

good: high-level tasks
- most studies do low level

good: tester not inventor
- many studies test own work

good: strong high-level analysis and discussion
bad: light on description, methodology, stats
Snap-Together Viz

coordinated visualizations
  - brushy/link
  - overview and detail
  - drill down
  - synchronized scrolling (navigation)

level 0: hardware data
level 1: flexible data
level 2: flexible viz
level 3: flexible coordination

Critique

good
  - introduces taxonomy
  - methodology details explained
  - data analysis
  - high-level discussion

Study Conclusions

previous paper
  - choice difficult
this paper
  - users can thrive on snap-together choices

why?
  - expert not casual users
  - tester is inventor
  - even higher-level tasks
  - more divergent alternatives
  - snap vs. hand-code
  - 3 end-user apps

Million Items Viz

scaling up treemaps
  - 1600x1200 pixels
  - million items

item
  - atomic object displayed as distinguishable contiguous area using one viz technique

Rendering Techniques

shading not outline
  - visually distinguish items with less pixels

show overlap
  - calculate with stencil buffer

transparency, stereo
  - only for interactive/transient exploring

Interaction Techniques

flipping/blinking
dynamic queries
  - assign depth
  - change 2–buffer with slider
excentric labels

animated transitions
  - stabilized layouts
  - separate translation, scaling
  - switching representations

[video]
Incremental Dynamic Queries

dynamic queries: user-controlled slider

Data Structures

setup
- data set
- selection
- picking particular range slider
querying
- moving the slider

maximum hit set
- state of other sliders
- extreme range of this slider
- precompute bins in the range so slider movement fast

Critique

good: complexity analysis

bad: far too little detail to replicate
- nothing on incremental rendering
- insufficient on computation data structures