

Evaluation, Scalability

Lecture 14 CPSC 533C, Spring 2004

3 Mar 2004

Evaluation, Scalability

Empirical Comparison of 3 InfoVis Systems

An Empirical Comparison of Three Commercial Information Visualization Systems. Alfred Kobsa, Proc. InfoVis 2001 (<http://citeseer.nj.nec.com/kobsa01empirical.html>)

Snap-Together Viz Evaluation

Snap-Together Visualization: Can Users Construct and Operate Coordinated Views? Chris North, B. Shneiderman, Intl. Journal of Human-Computer Studies, Academic Press, 53(5), pg. 715-739, (November 2000). (<http://www.cs.vt.edu/~north/papers/snap-IJHCS.pdf>)

Million-Item Viz

Interactive Information Visualization of a Million Items Jean-Daniel Fekete and Catherine Plaisant, Proc InfoVis 2002. (<http://www.cs.umd.edu/local-bin/hcl/rr/number=2002-01>)

Incremental Dynamic Queries

Design and Evaluation of Incremental Data Structures and Algorithms for Dynamic Query Interfaces Egemen Tanin, Richard Beigel, Ben Shneiderman, Proc. InfoVis 1997. (<http://citeseer.nj.nec.com/tanin97research.html>)

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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

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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
- "resorted to counting"

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Systems Strengths

InfoZoom

- when zooming the right strategy

Spotfire

- when scatterplots/histograms right strategy

TableLens

- when sorting the right strategy

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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

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Snap-Together Viz

coordinated visualizations

- brush/link
- overview and detail
- drill down
- synchronized scrolling (navigation)

level 0: hardwire data

level 1: flexible data

level 2: flexible viz

level 3: flexible coordination

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Critique

good

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

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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

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Million Items Viz

scaling up treemaps

- 1600x1200 pixels

- million items

item

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

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Rendering Techniques

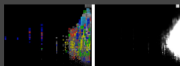
shading not outline

- visually distinguish items with less pixels



show overlap

- calculate with stencil buffer



transparency, stereo

- only for interactive/transient exploring

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Interaction Techniques

flipping/blinking

dynamic queries

- assign depth

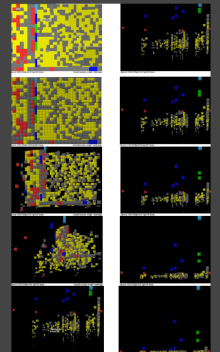
- change Z-buffer with slider

excentric labels

animated transitions

- stabilized layouts
- separate translation, scaling
- switching representations

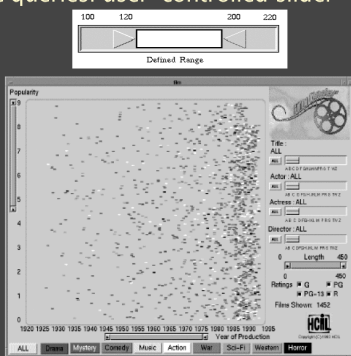
[video]



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Incremental Dynamic Queries

dynamic queries: user-controlled slider



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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

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Critique

good: complexity analysis

bad: far too little detail to replicate

- nothing on incremental rendering
- insufficient on computation data structures