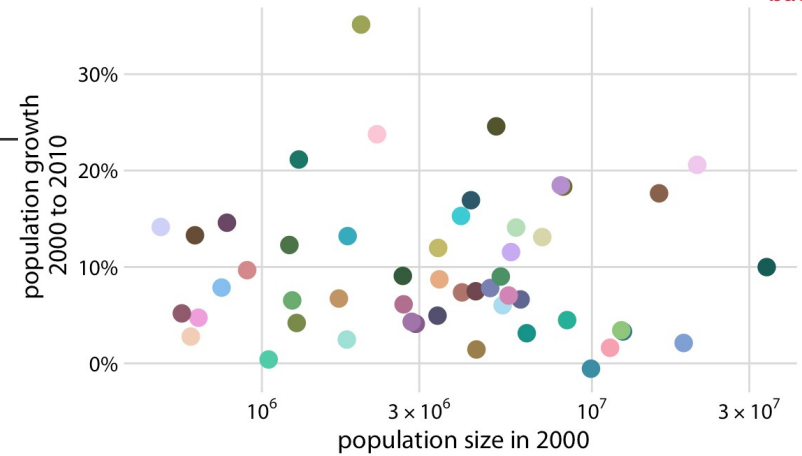
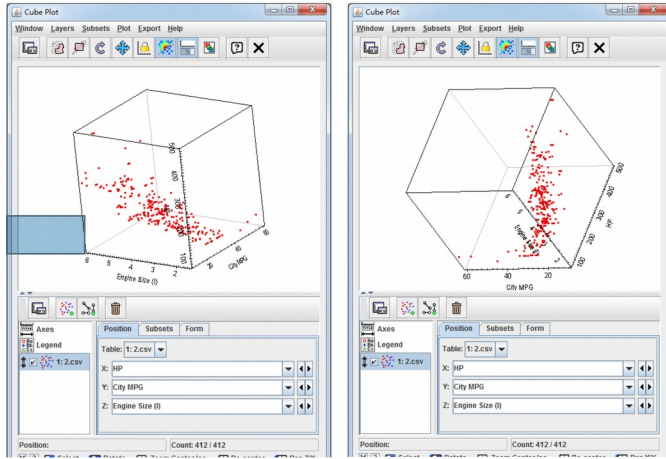


Infovis: multiple views

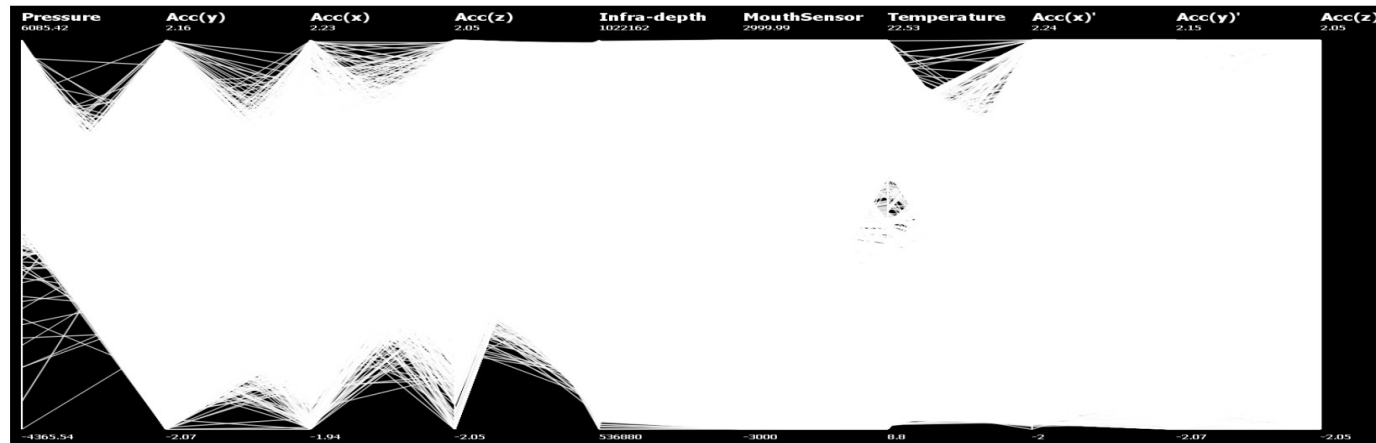
Thomas Torsney-Weir

Too many attributes



state

- | | | |
|----------------------|----------------|----------------|
| Alabama | Kentucky | North Dakota |
| Alaska | Louisiana | Ohio |
| Arizona | Maine | Oklahoma |
| Arkansas | Maryland | Oregon |
| California | Massachusetts | Pennsylvania |
| Colorado | Michigan | Rhode Island |
| Connecticut | Minnesota | South Carolina |
| Delaware | Mississippi | South Dakota |
| District of Columbia | Missouri | Tennessee |
| Florida | Montana | Texas |
| Georgia | Nebraska | Utah |
| Hawaii | Nevada | Vermont |
| Idaho | New Hampshire | Virginia |
| Illinois | New Jersey | Washington |
| Indiana | New Mexico | West Virginia |
| Iowa | New York | Wisconsin |
| Kansas | North Carolina | Wyoming |

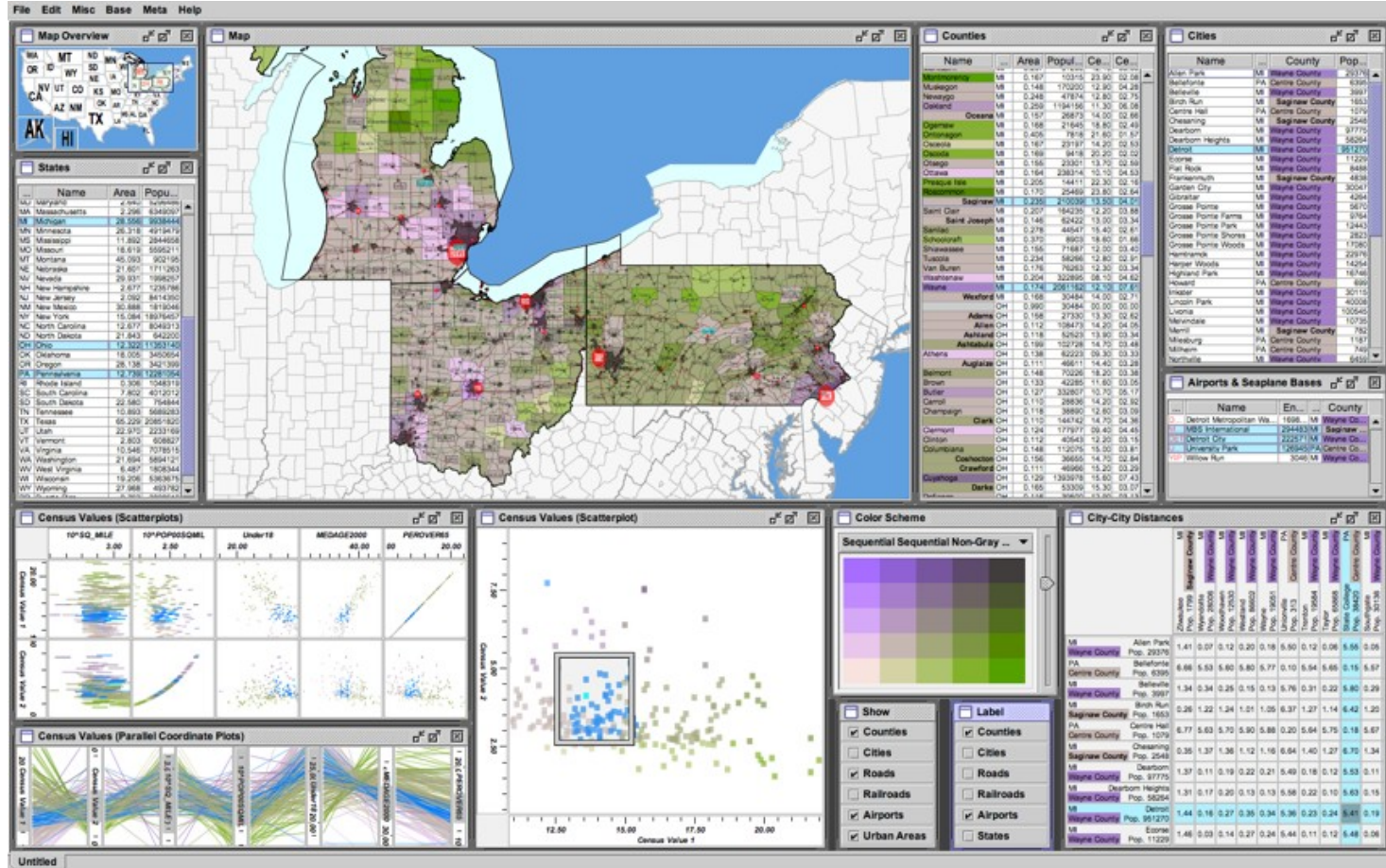


What to do?

- split data into multiple sections
- visualize each part separately
- link these together with interaction
(coordinated multiple linked views)

Wang Baldonado,
Michelle Q., Allison Woodruff, and Allan Kuchinsky. "Guidelines for using multiple views in information visualization,"
Proceedings of the working conference on Advanced visual interfaces. 2000.

Improvise



Weaver, Chris. "Building Highly-Coordinated Visualizations in Improvise." In IEEE Symposium on Information Visualization, 159-166. Institute of Electrical & Electronics Engineers (IEEE), 2004. <https://doi.org/10.1109/infvis.2004.12>.

Advantages

- **eyes over memory:** two simultaneous views have a lower cognitive load than remembering previous views
- Each visualization can use just a few visual encodings
- Different encodings can lead to different insights

Splitting views

Coordinated multiple linked views

Multiple (different) aspects of a dataset
linked together through interaction

- small multiples
- focus + context
- multiple views

Splitting data

- Subset items
- Subset attributes
- Both!
- Clustering

Small multiples

- Same visualization different data
- Only has to learn to “read” one plot type
- Often used for time varying data

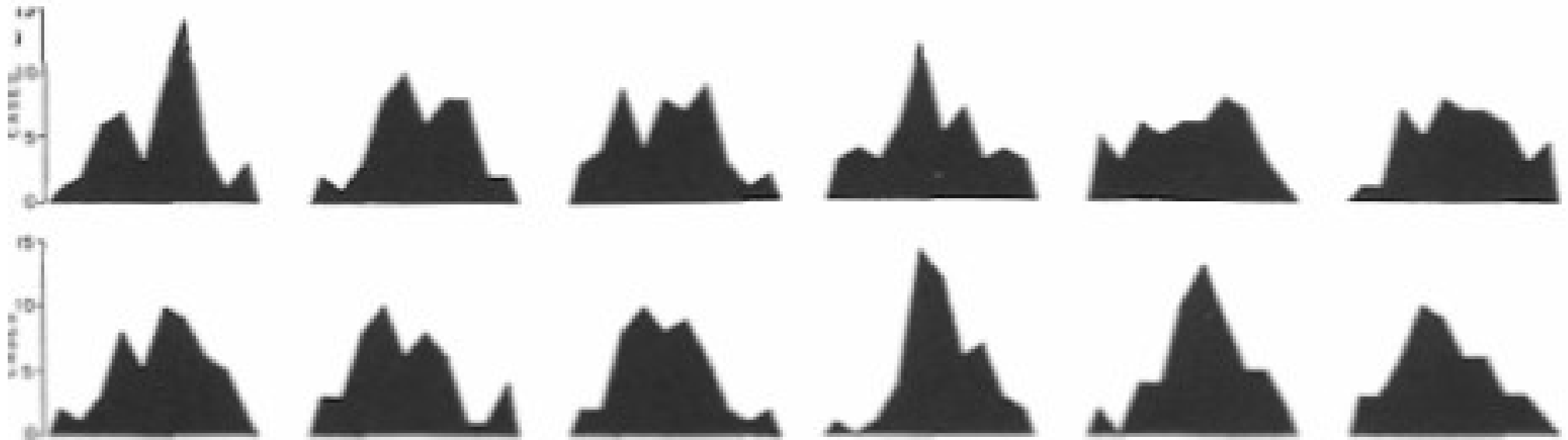
Space vs time

Used as an alternative to video

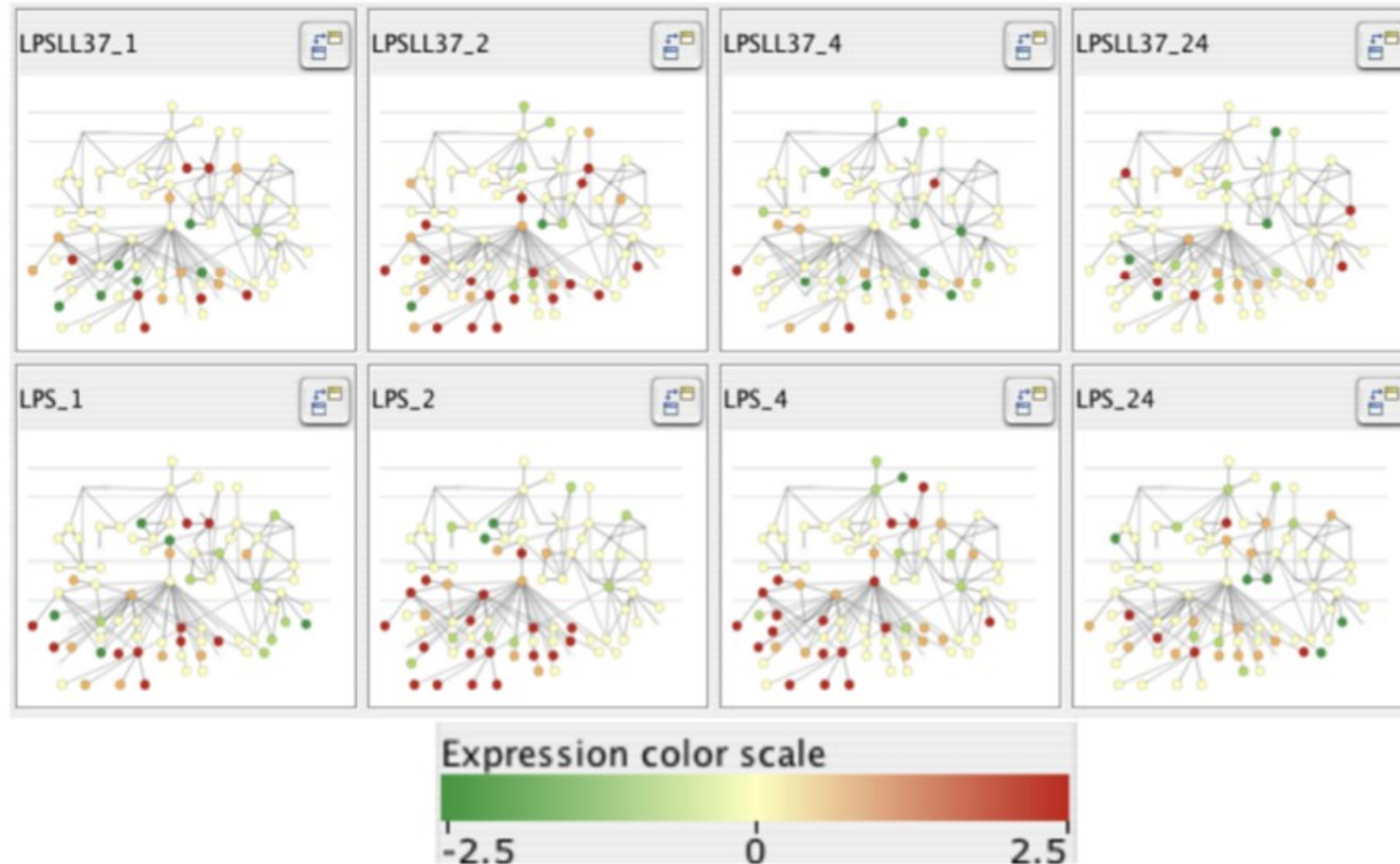


Small multiples

Side by side easier than temporal



Cerebral



Focus + context

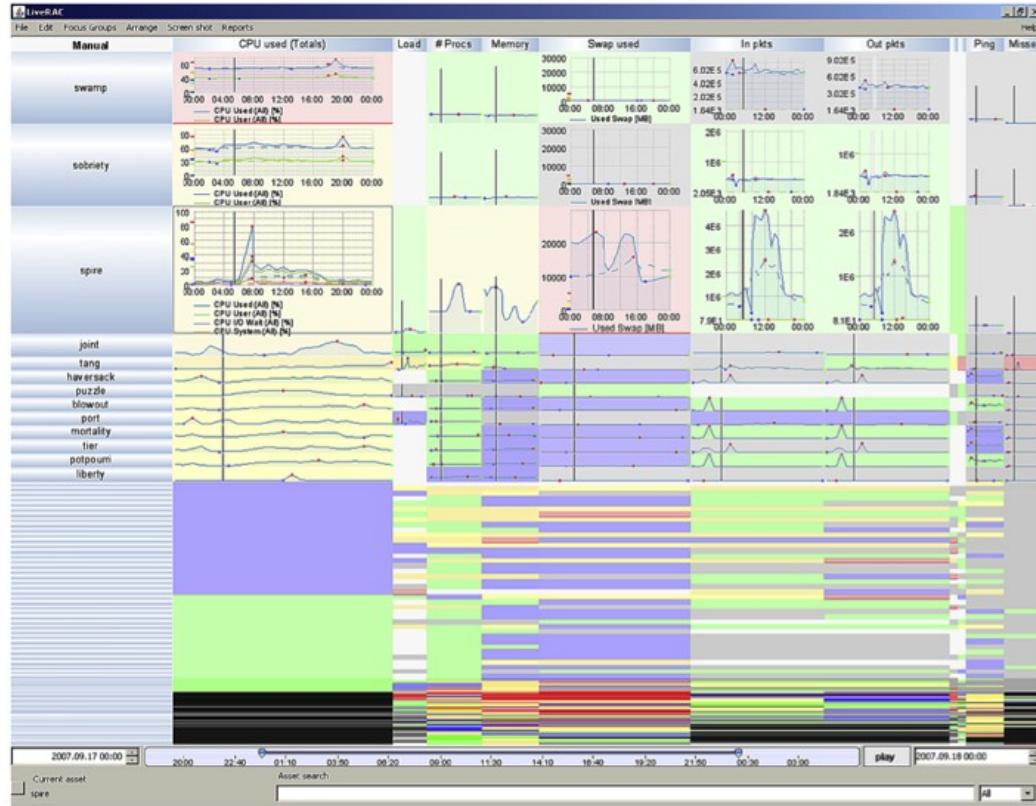
- 2 primary views of data
 - Overview (context)
 - Detail (focus)
- Zooming metaphor is often used

Maps!



Semantic zoom

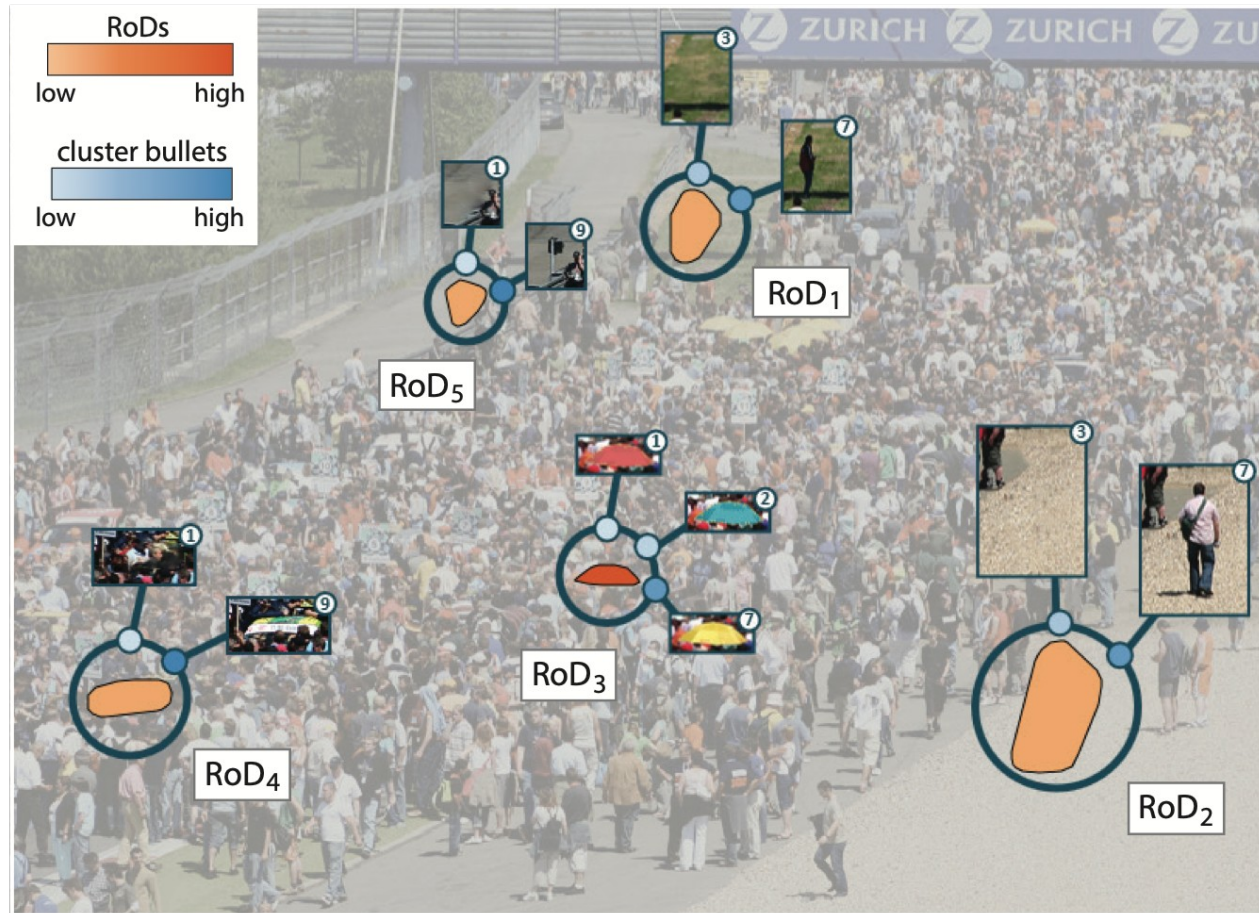
Automatically determine visual encoding based on space



McLachlan, Peter, Tamara Munzner, Eleftherios Koutsofios, and Stephen North. "LiveRAC: Interactive Visual Exploration of System Management Time-Series Data." In Proceeding of the Twenty-Sixth Annual SIGCHI Conference on Human Factors in Computing Systems, 1483-1492. ACM, 2008.

<http://portal.acm.org/citation.cfm?id=1357286>.

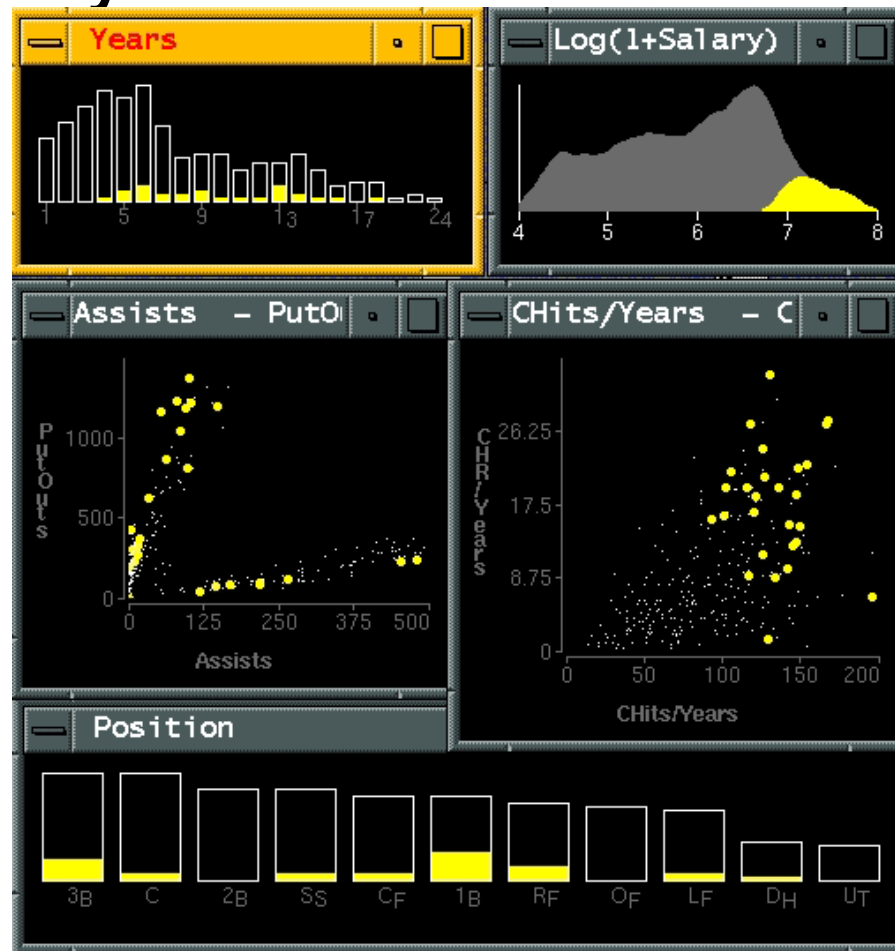
VAICo



Multiple views

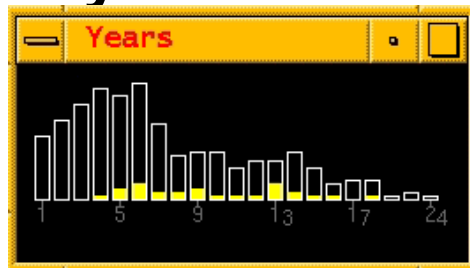
- Each subset of data is given a unique view
- “Best” view can be chosen for task/data
- Views are linked with interaction

Exploratory data visualizer

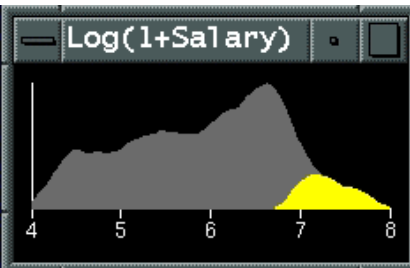


Exploratory data visualizer

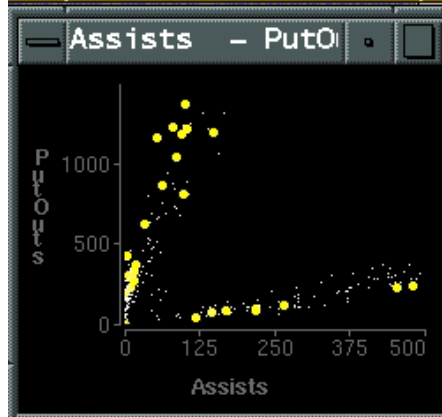
how long
in majors



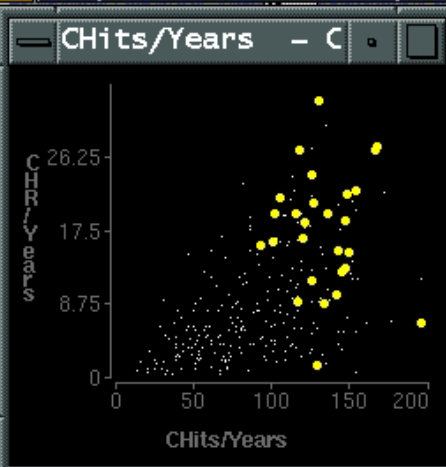
select high
salaries



avg assists vs
avg putouts
(fielding ability)



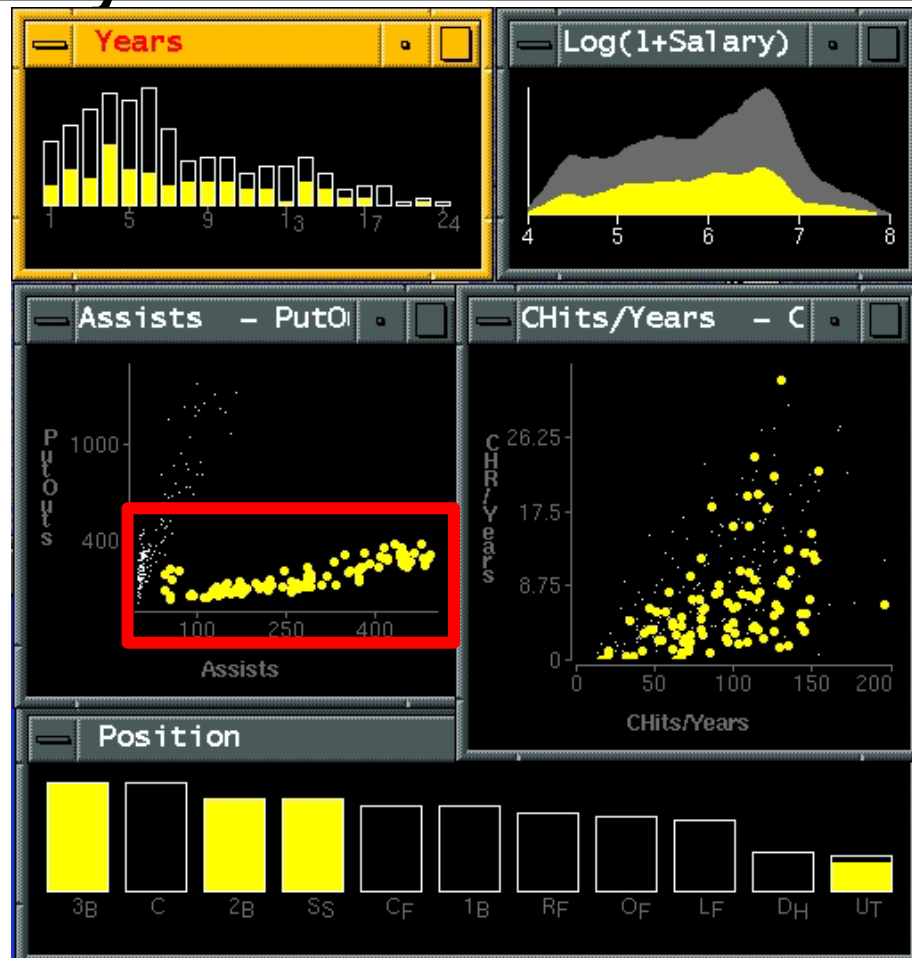
avg career
HRs vs avg
career hits
(batting ability)



distribution
of positions
played

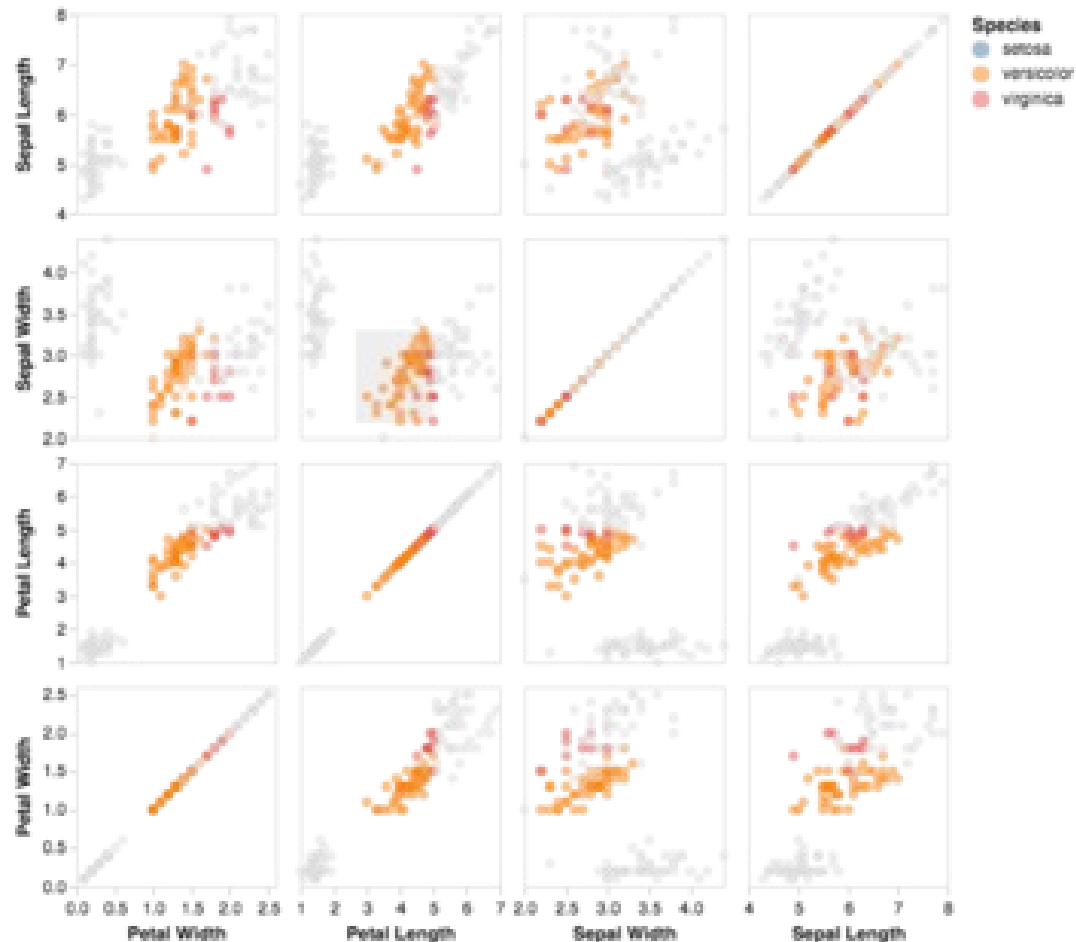


Exploratory data visualizer



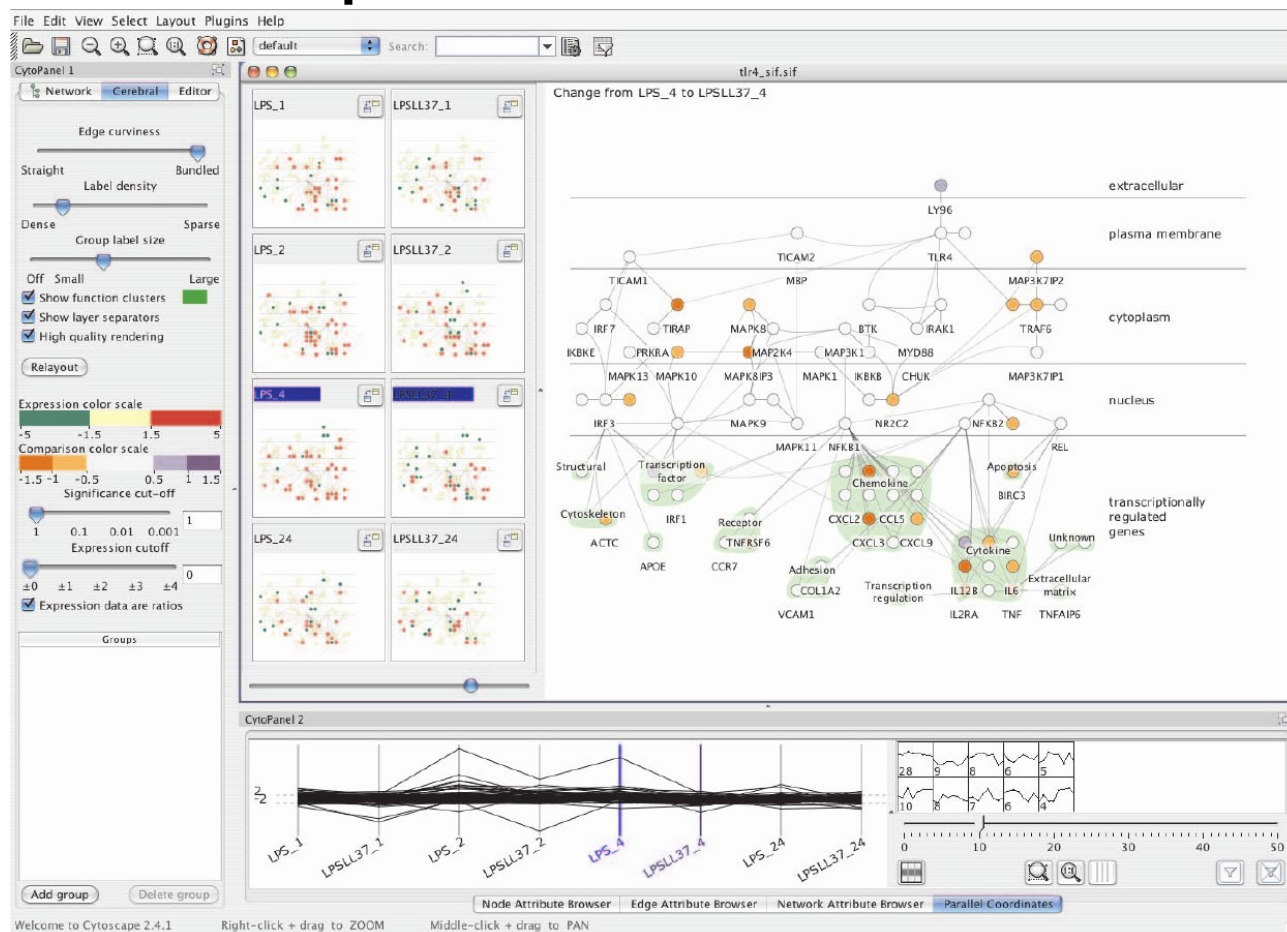
Interaction

Linked brushing



Demo: <https://vega.github.io/vega/examples/brushing-scatter-plots/>

Linked comparison



Conclusion

Summary

- eyes over memory
- Splitting views is very powerful
- Interaction is key