Multiple Views

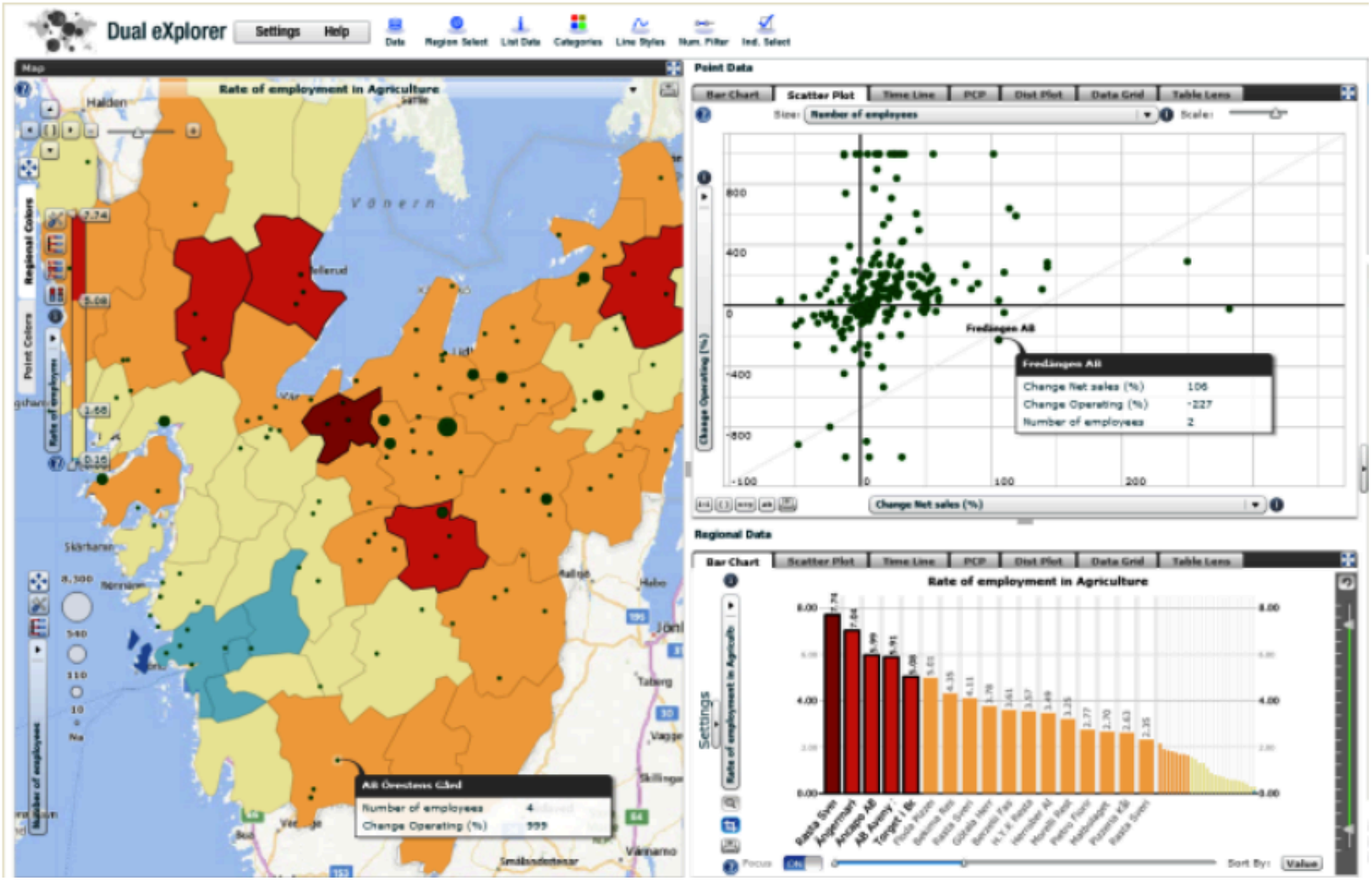


Image source: http://ncva.itn.liu.se/r

Why use multiple views?

- Data diversity (attributes, models, etc.)
- Want to find correlations or disparities
- Improve user performance when one view overwhelms

[Wang Baldonado et al., 2000]

Diversity of data

Diverse Attributes

- Attributes (e.g., dates traveled, histogram of countries visited)
- Subsets or aggregate views shown simultaneously

Level of Abstraction

- Layers of detail (e.g., entire city vs. detail of streets)

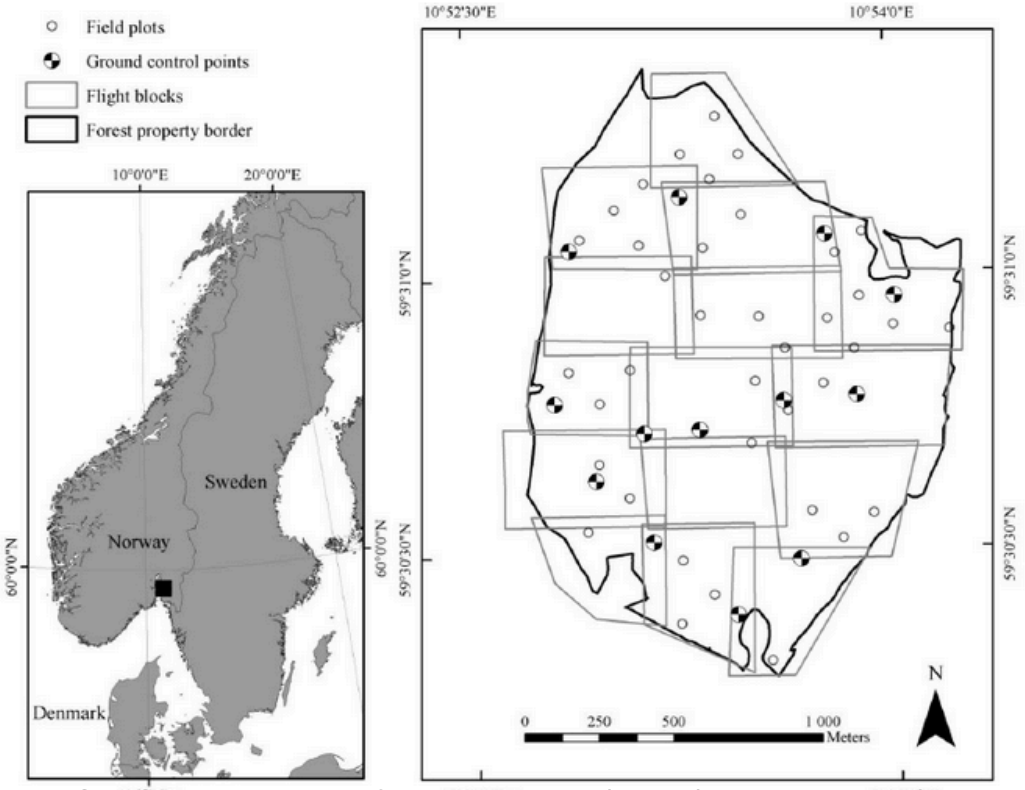
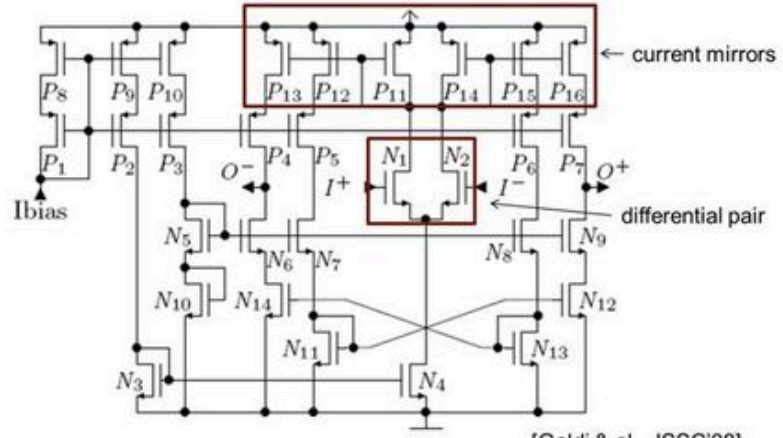
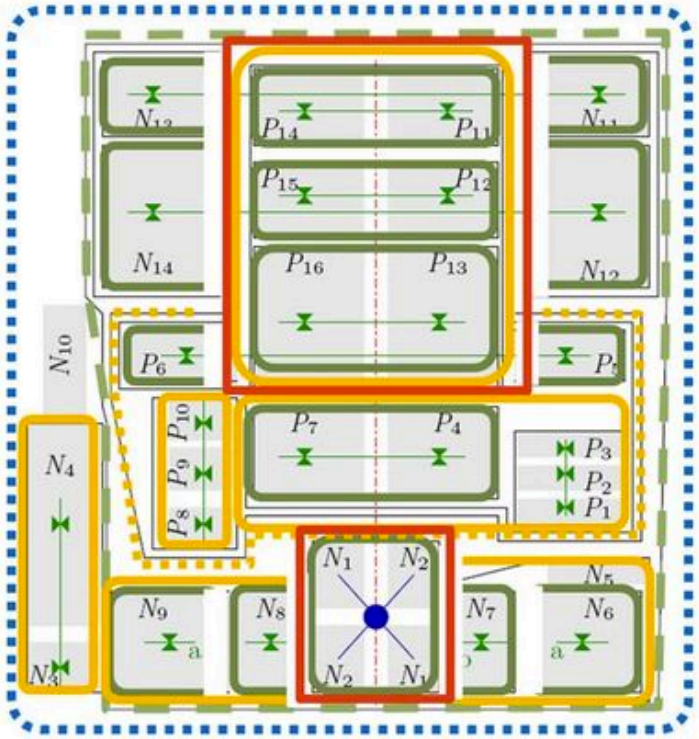
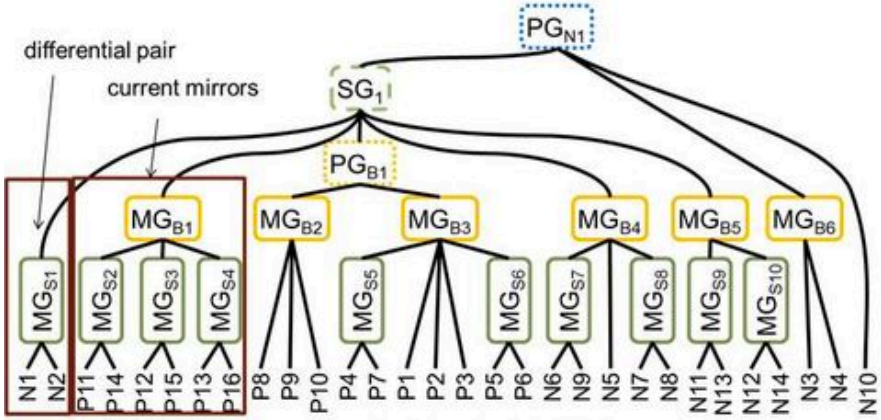


Image Source: Puliti, S., Ørka, H. O., Gobakken, T., & Næsset, E. (2015). Inventory of small forest areas using an unmanned aerial system. *Remote Sensing*, *7*(8), 9632-9654.

Multiple Data Models







MG$_{S/B}$: Matching group (symmetry / building blocks); SG: Symmetry group;
PG$_{B/N}$: Proximity group (building blocks / netlist)

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Design Considerations

Correlations/ Disparities

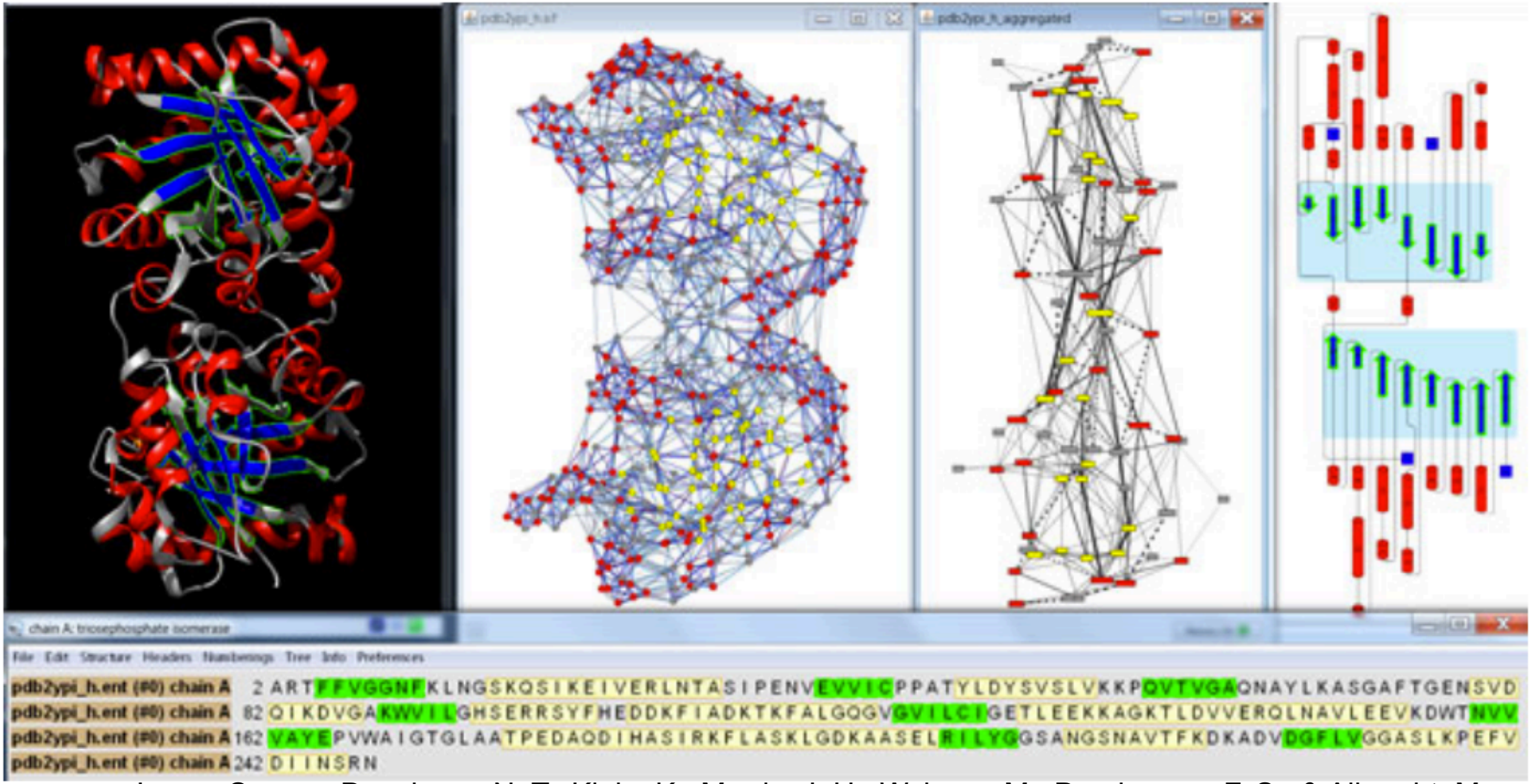


Image Source: Doncheva, N. T., Klein, K., Morris, J. H., Wybrow, M., Domingues, F. S., & Albrecht, M. (2014). Integrative visual analysis of protein sequence mutations. In BMC Proceedings.

Consistent Encodings

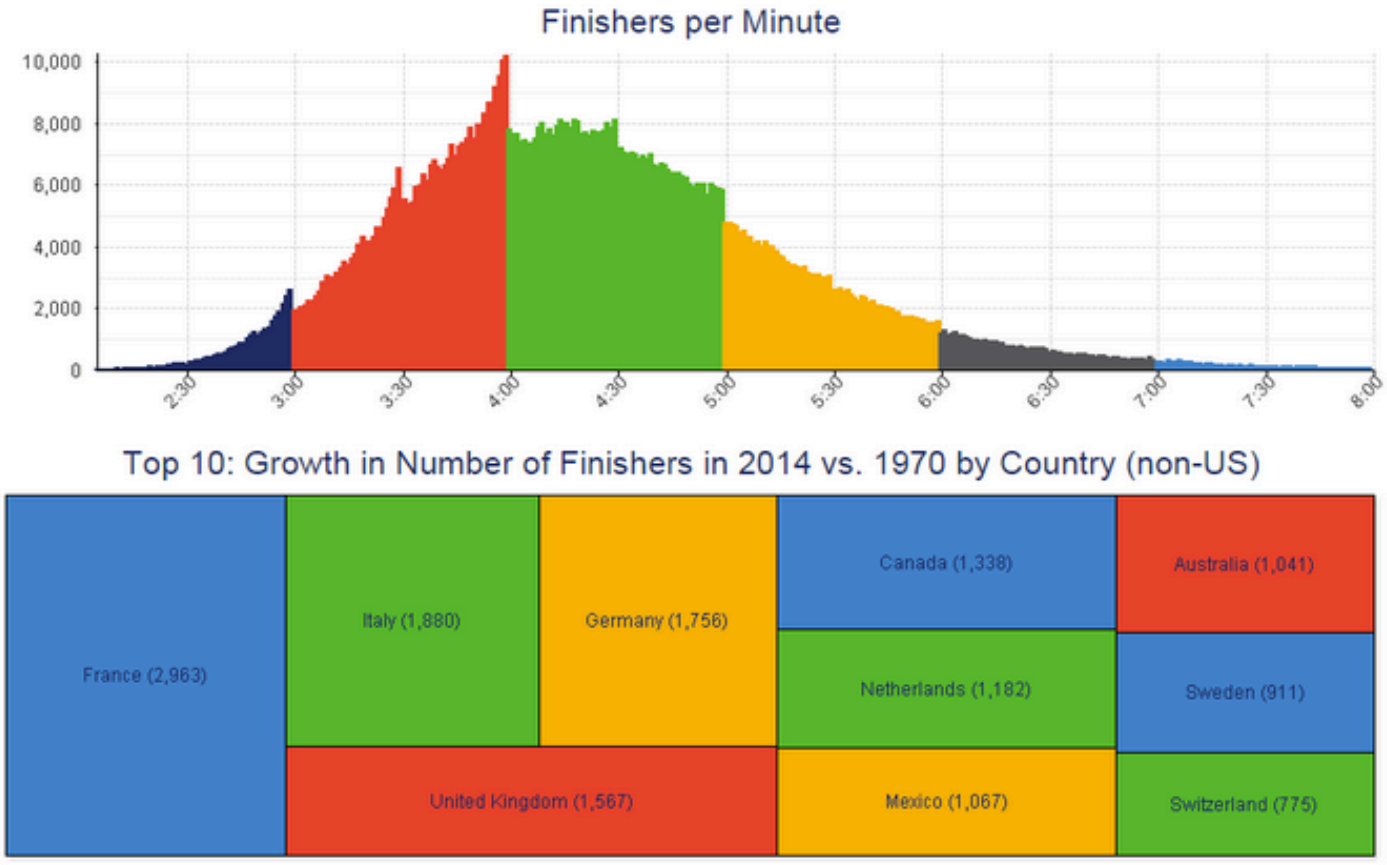
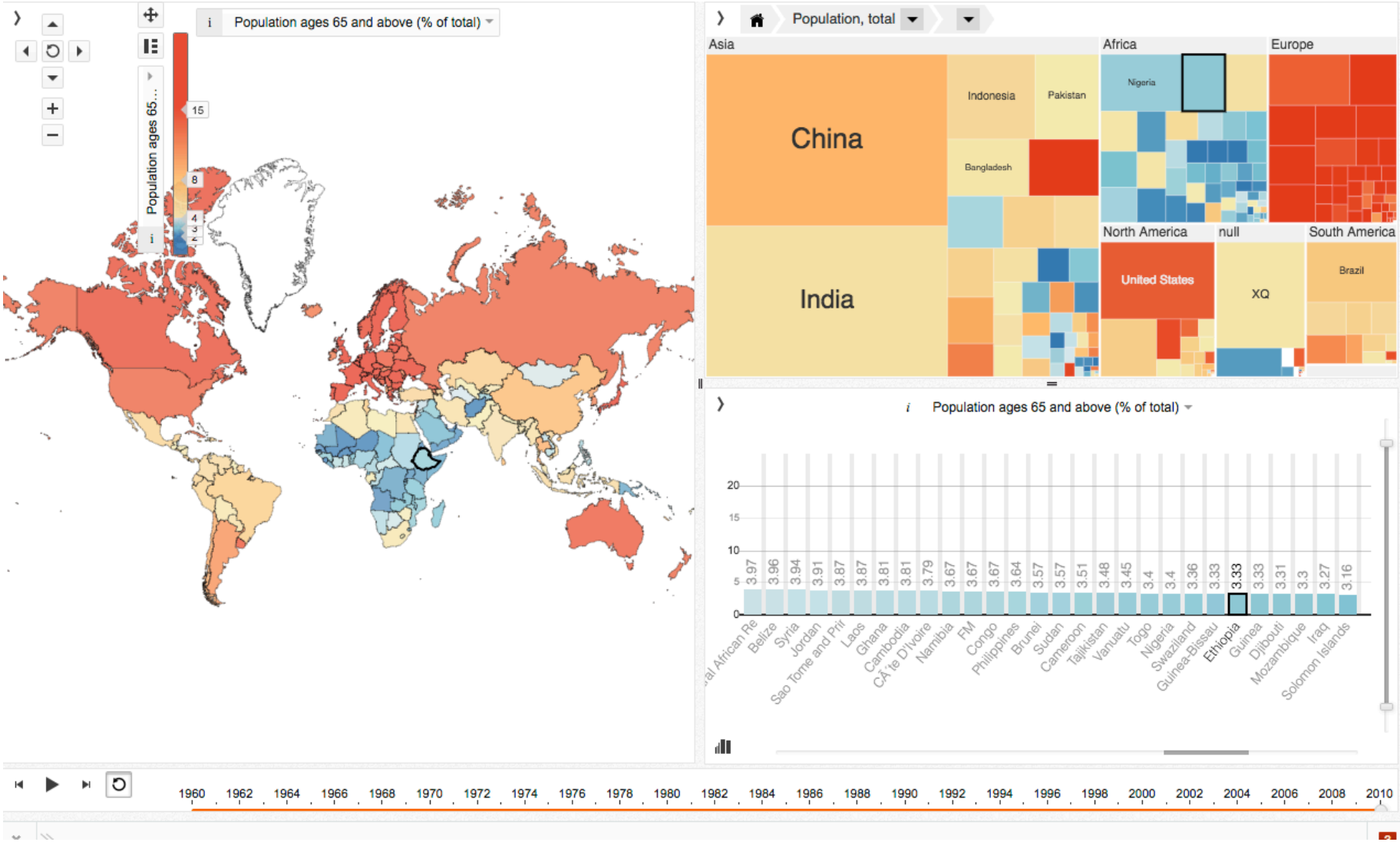


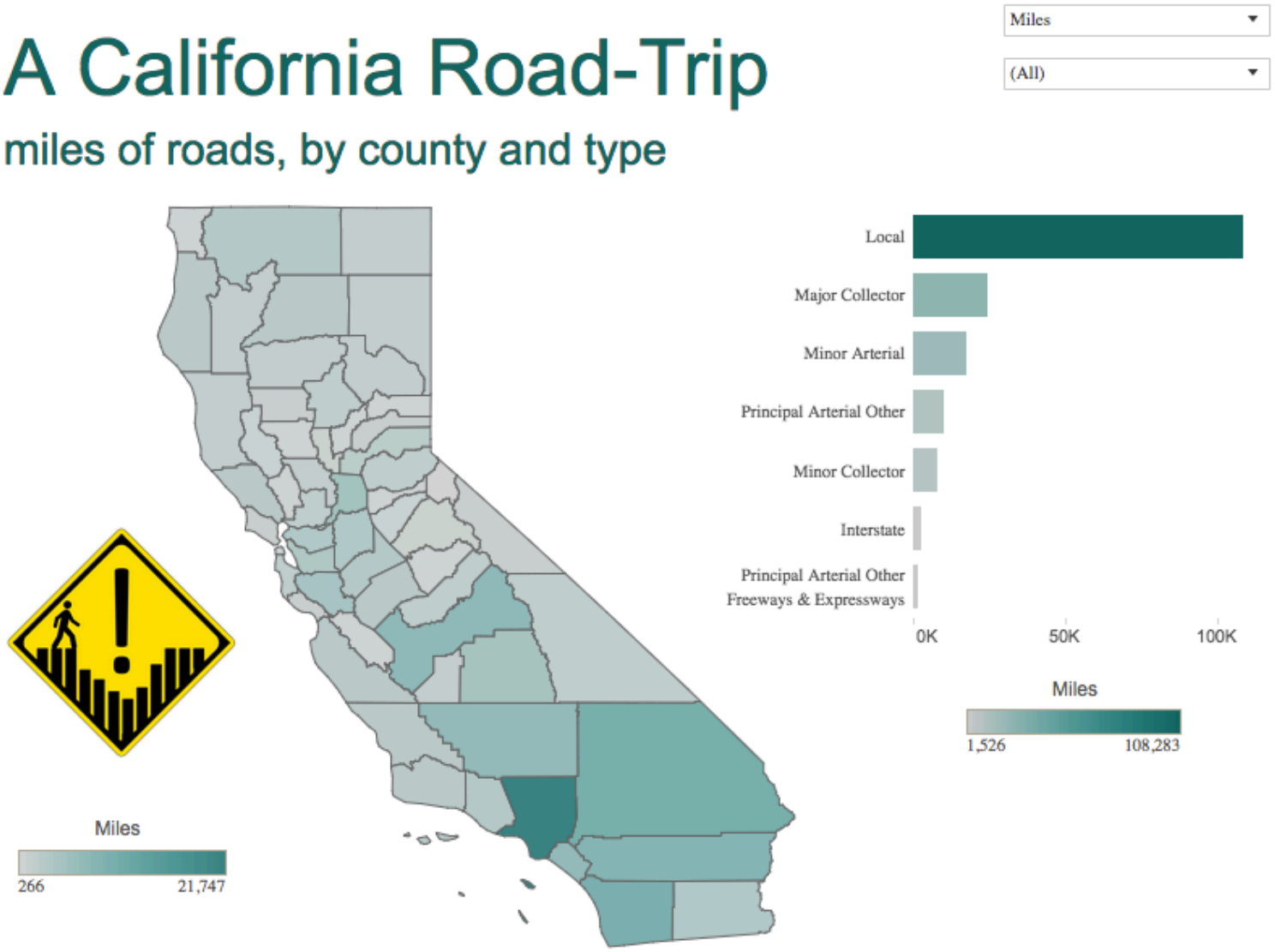
Chart Source: http://dataremixed.com/2015/11/avoiding-data-pitfalls-part-3-confusing-colors/



http://mitweb.itn.liu.se/GAV/dashboard/

A California Road-Trip

miles of roads, by county and type



Source: http://dataremixed.com/2015/11/avoiding-data-pitfalls-part-3-confusing-colors/

A California Road-Trip

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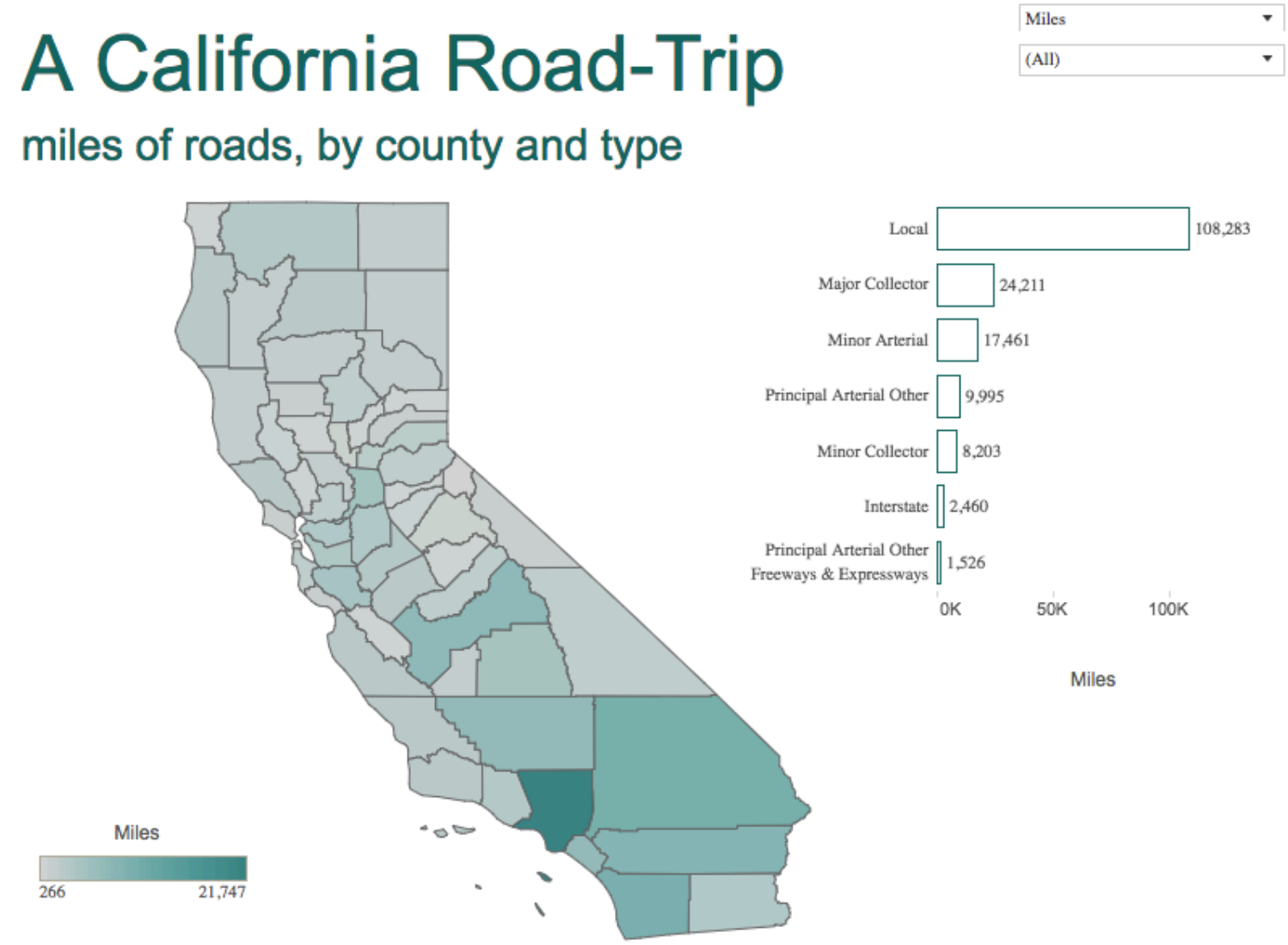
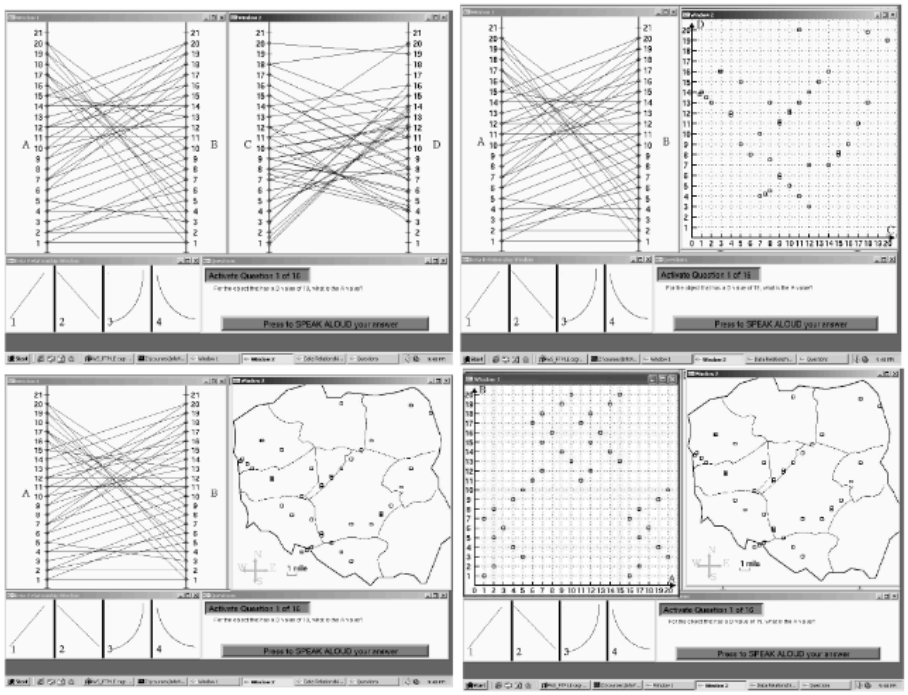


Source: http://dataremixed.com/2015/11/avoiding-data-pitfalls-part-3-confusing-colors/

Perceptual Cues

Source: http://www.dashboardinsight.com/news/news-articles/interview-with-stephen-few-dashboard-design-challenges.aspx

Similar View Placement

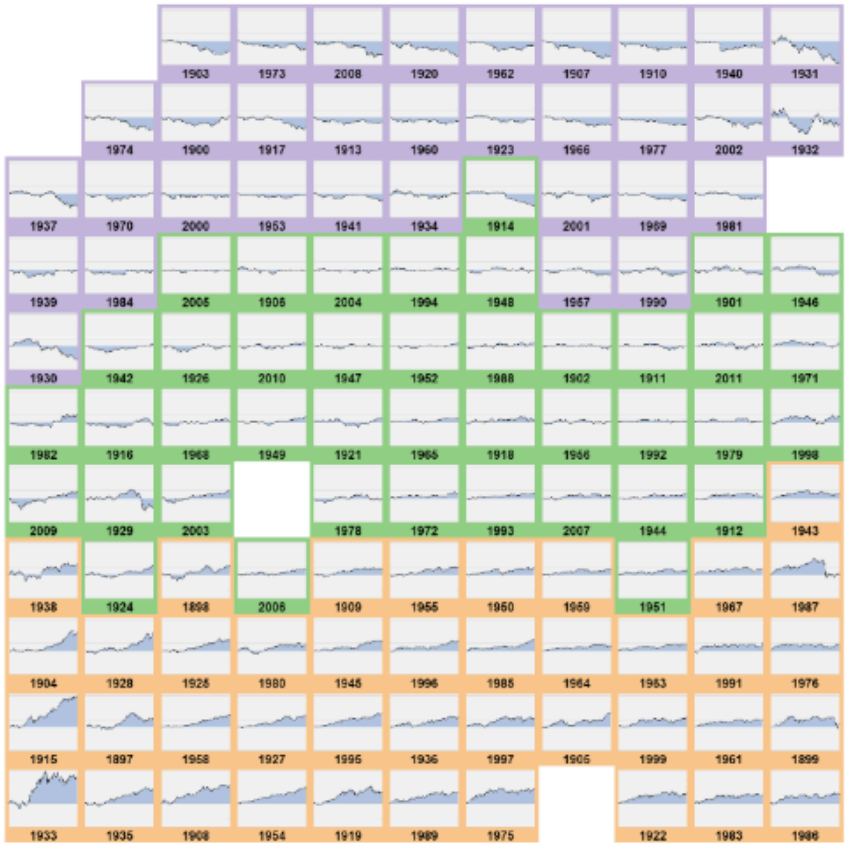


- Examined context switching
- Dual-view similar charts made for poor pattern search

[Convertino et al, 2003]

Convertino et al., 2003. Exploring context switching and cognition in dual-view coordinated visualizations. In Coordinated and Multiple Views in Exploratory Visualization, 2003. Proceedings. International Conference on (pp. 55-62). IEEE.

Small Multiple Placement

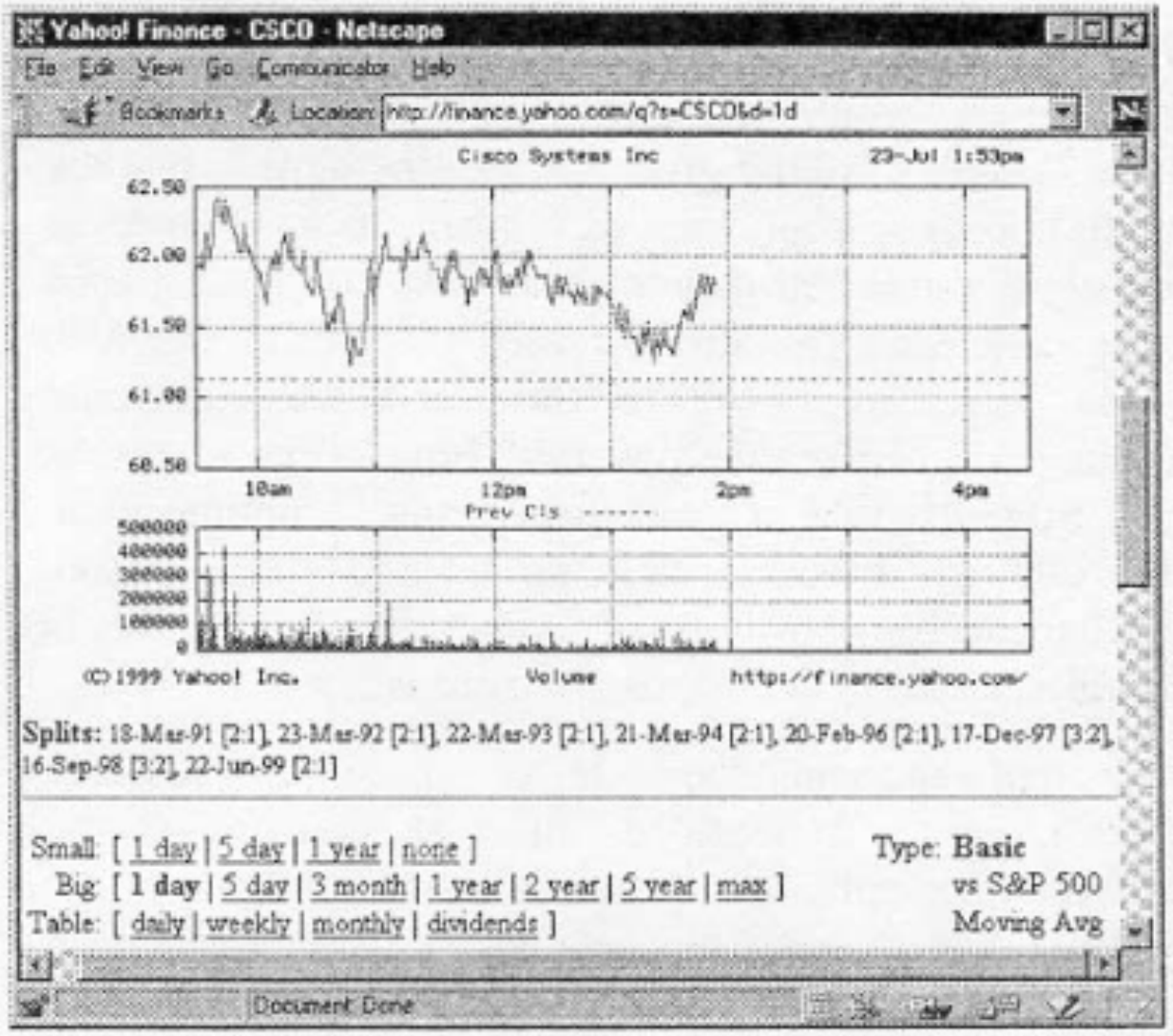


- Correlated small multiple views perform well for visual search & comparison

  [Liu et al., 2015]

Source: Liu, X., Hu, Y., North, S., & Shen, H. W. 2015. Correlated Multiples: Spatially Coherent Small Multiples With Constrained Multi-Dimensional Scaling.

Display & Task Time Optimization



Code Optimization

Making your code:

- Reusable
- Cleaner
- Scalable
- Modular

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