

Geospatial Visualization

CS533C 2009F InfoVis Presentation

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Papers

- *Geographic visualization: designing manipulable maps for exploring temporally varying georeferenced statistics.* Alan M. MacEachren, A.M. Boscoe, F.P. Haug, D. Pickle, L.W. (1998). *Information Visualization* 1998, 87-94.
- *Case Study: Design and Assessment of an Enhanced Geographic Information System for Exploration of Multivariate Health Statistics.* Robert M. Edsall, Alan M. MacEachren and Linda Pickle. *Proc. InfoVis 2001*.
- *Hotmap: Looking at Geographic Attention.* Danyel Fisher. *IEEE TVCG*, 13(6), 1184-1191 (*Proc. InfoVis 2007*).

Focus

- Problem domain
- Visualization techniques
- Critiques

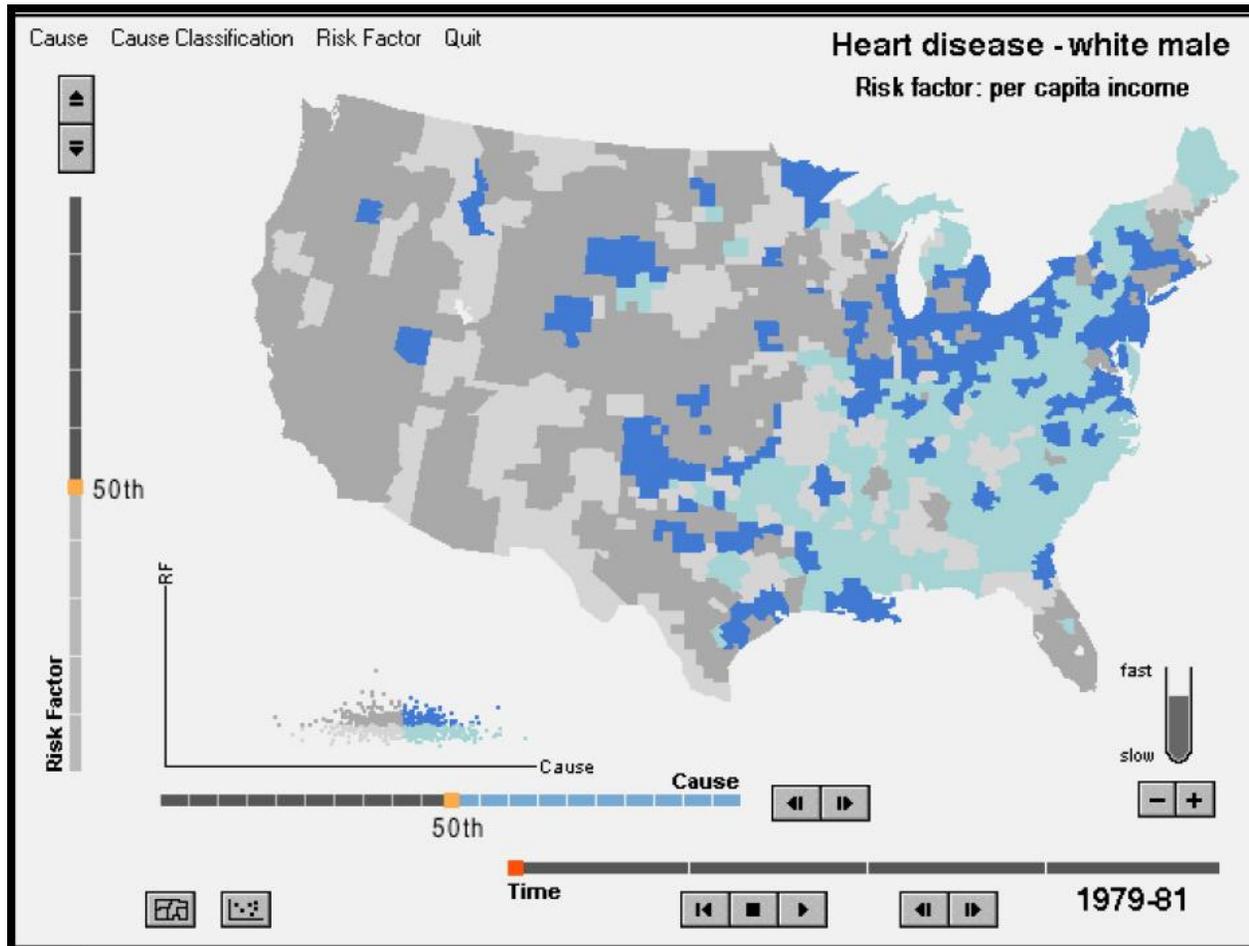
Beginning with...

- *Geographic visualization: designing manipulable maps for exploring temporally varying georeferenced statistics.* Alan M. MacEachren, A.M. Boscoe, F.P. Haug, D. Pickle, L.W. (1998). *Information Visualization 1998*, 87-94.
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Problem Domain

- Spatial-temporal analysis on health statistics using choropleth mapping in United States
- Comparing change over time for two variables (mortality and risk factors)
- Visualization Technique: HealthVis
 - Animation
 - Crossmap with focusing

Visualization - HealthVis



Critique

- Cons
 - Identifying trends still is not easy without knowing the right level of focus beforehand. (only 3 of 9 participants noticed the targeted trend)

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 - Combining cross map and animation: neat interaction technique to reveal spatio-temporal patterns associated with two variables

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 - Lack of labeling (i.e. values on the scatterplot, states on the map)
- Pros
 - Combining cross map and animation: neat interaction technique to reveal spatio-temporal patterns associated with two variables
 - Nice visualization given the tools available at the time?

Next up...

- *Geographic visualization: designing manipulable maps for exploring temporally varying georeferenced statistics.* Alan M. MacEachren, A.M. Boscoe, F.P. Haug, D. Pickle, L.W. (1998). *Information Visualization* 1998, 87-94.
- ***Case Study: Design and Assessment of an Enhanced Geographic Information System for Exploration of Multivariate Health Statistics.*** Robert M. Edsall, Alan M. MacEachren and Linda Pickle. **Proc. InfoVis 2001.**
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Problem Domain

- Exploring multidimensional health statistics
- Mortality data from specific cancers relating to other mortality causes and risk factors
- Visualization Technique
 - Parallel Coordinate Plot (PCP)

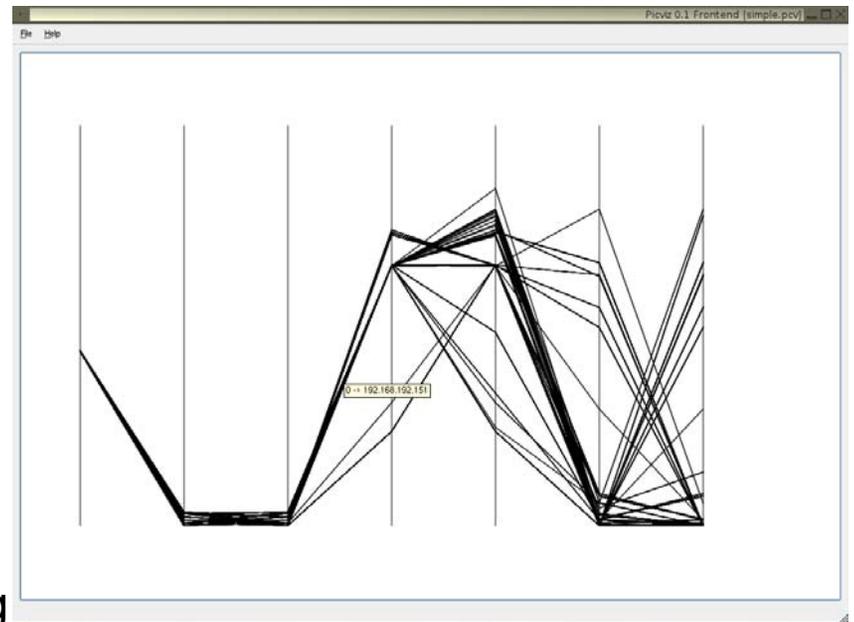
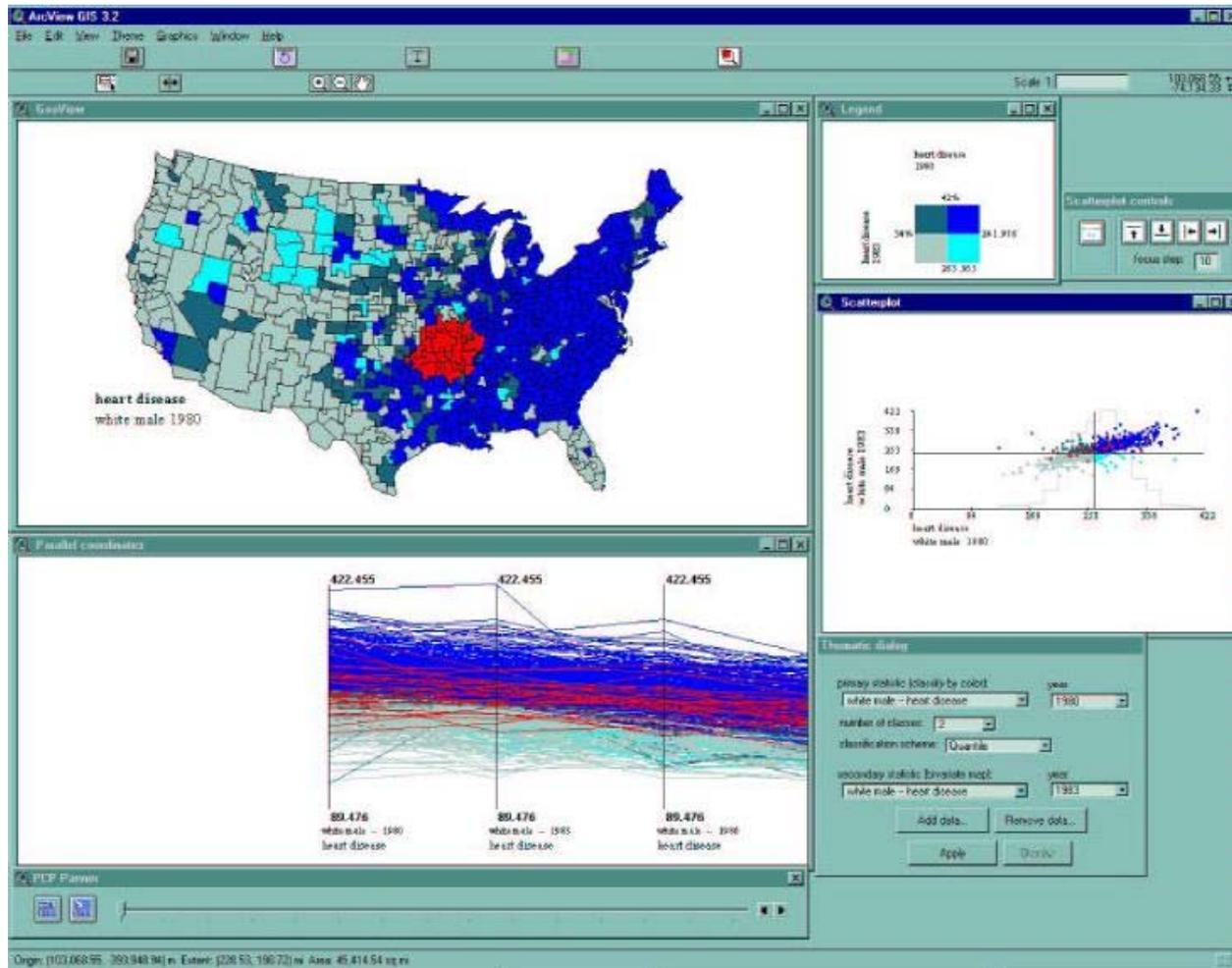


Image from wikipedia.org

Technique - HealthVisPCP



Critique

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 - PCP a good way to visualize multidimensional geospatial data?

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 - Clustering and tangling
 - Unsuitable for comparing distant axes

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 - PCP a good way to visualize multidimensional geospatial data?
 - Clustering and tangling
 - Unsuitable for comparing distant axes
- Pros
 - Added labeling on both scatterplot and legend
 - Attempt to overcome PCP's disadvantages (brushing, focusing and coloring)
 - Utilizing multiple linked views

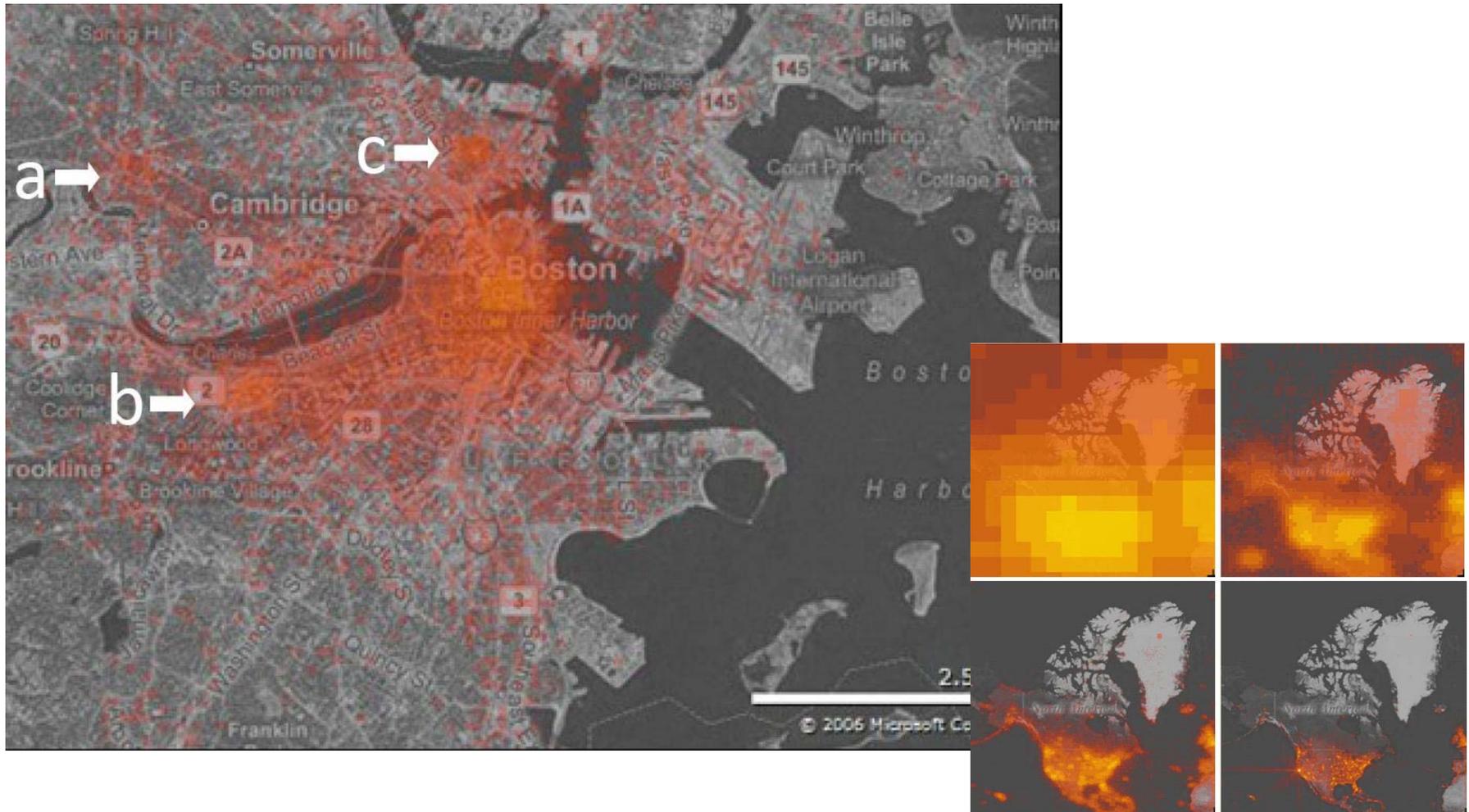
Almost there...

- *Geographic visualization: designing manipulable maps for exploring temporally varying georeferenced statistics.* Alan M. MacEachren, A.M. Boscoe, F.P. Haug, D. Pickle, L.W. (1998). *Information Visualization* 1998, 87-94.
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Problem Domain

- Imagery acquisition for map
- Log file visualization by showing the download frequency of each image tile of Microsoft's Live Search Map
- Visualization Technique
 - Heatmap
 - Offsets to show data at different levels of details

Visualization - Hotmap



Critique

- Pros
 - Visualizing usage data in its own space: very cool!
 - Tackles the problem nicely, lots of applications
 - Automated tour guide
 - Finding bugs and usability errors
 - Server-side caching optimization

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- Pros
 - Visualizing usage data in its own space: very cool!
 - Tackles the problem nicely, lots of applications
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 - Finding bugs and usability errors
 - Server-side caching optimization
- Cons
 - Occlusion?

Video Demo

- Gapminder.org

Questions/Comments?