Slide 1

Geospatial Visualization

CS533C 2009F InfoVis Presentation

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November 23, 2009

Slide 2

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).

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Focus

- Problem domain
- Visualization techniques
- Critiques

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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.***
- *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

- 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

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Visualization - HealthVis
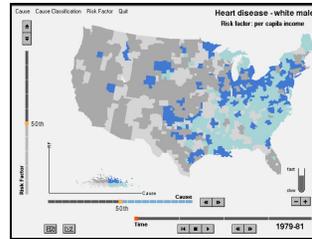
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Critique

- 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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Critique

- Cons
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  - Lack of labeling (i.e. values on the scatterplot, states on the map)

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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)
  - 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

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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)
  - 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?

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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

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Technique - HealthVisPCP
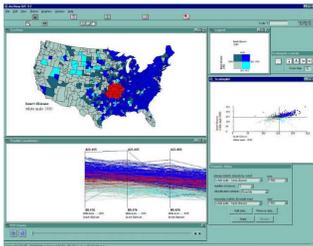
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Critique

- Cons
  - PCP a good way to visualize multidimensional geospatial data?

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Critique

- Cons
  - PCP a good way to visualize multidimensional geospatial data?
  - Clustering and tangling
  - Unsuitable for comparing distant axes

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Critique

- Cons
  - 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

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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.
- *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

- 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
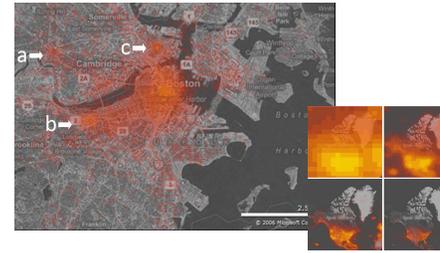
Critique

- 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

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
- Cons
  - Occlusion?

Video Demo

- Gapminder.org

Questions/Comments?