Course Review

CS 7450 - Information Visualization
December 5, 2012
John Stasko

Syllabus Review

Overview

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Your Reflections

- What were most interesting topics?
- What are key research challenges?
- What should be done in the future?

Research Directions

- Data issues
  - Scale
  - Static versus dynamic
  - Spatial versus nonspatial
  - Nominal versus ordinal
  - Structured versus nonstructured
  - Time
  - Varying quality
Research Directions

- Issues of cognition, perception, & reasoning
  - How do humans solve problems with the aid of visuals?
  - How can we leverage this knowledge to build better tools?
    Understand analytic tasks better
  - How can visualization assist learning?

- Issues of system design
  - How to integrate computational analysis with visualization better
  - Develop powerful new interaction paradigms
  - Make visualizations engaging and easier to use/create (for the masses)
  - Holy Grail: Automatic visualization design
Research Directions

• Issues of evaluation
  – What is the importance of aesthetics?
  – Understand human perceptual and cognitive limitations
  – How to measure the benefits compared to other analysis methods?
  – What quantitative and qualitative measures of usability are important?
  – How do we measure the information content, distortion, and loss in a visualization?
  – What are the trade-offs between long, longitudinal studies and limited tests with more subjects?
  – What mixture of domain knowledge and visualization knowledge is needed to design and develop effective tools?

Research Directions

• Hardware issues
  – Handhelds to display walls
  – GPU benefits
  – New interaction devices
Research Directions

- Issues of applications
  - How to best collaborate with domain experts to help solve their problems?
  - What new domains can be addressed?

Promising Trends

- Built-in best practices
  - Banking to 45°, Tableau
- Integrated support for geo-spatial analysis
  - Learn from cartographers, Google maps
- Integrated support for network analysis
  - Vizster, Social Action, Ploceus
- Integrated support for collaborative analysis
  - Many Eyes, sense.us
Promising Trends

- Custom analytical applications
  - Spotfire, Qlikview
- Illuminating predictive models
  - Risk, uncertainty, opening the black box
- Integrated data mining
  - Friend not foe
- Improved HCI devices
  - Large, multi-touch displays

Visualization Zoo

<table>
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<th>Time series data</th>
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<td>Node-link diagrams</td>
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<td>Stacked graph</td>
<td>Cartesian</td>
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<tr>
<td>Small multiples</td>
<td>Radial (dendogram)</td>
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<tr>
<td>Horizon graph</td>
<td>Indented tree layout</td>
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<td>Statistical distributions</td>
<td>Adjacency diagrams</td>
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<td>Stem-and-leaf plots</td>
<td>Icicle plot</td>
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<td>Q-Q plots</td>
<td>SunBurst</td>
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<tr>
<td>Scatter plot matrix</td>
<td>Enclosure diagrams</td>
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<td>Parallel coordinates</td>
<td>Treemap</td>
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<td>Flow map</td>
<td>Force-directed</td>
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<td>Choropleth map</td>
<td>Arc diagram</td>
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<td>Graduated symbol map</td>
<td>Matrix views</td>
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<td>Cartograms</td>
<td>Heer, Bostock &amp; Ogievetsky</td>
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CACM ’10

http://queue.acm.org/detail.cfm?id=1805128
In-Class Final

• Some old questions

HW 8 Recap

• Solution form and quality
  – The real solution!

• Comments about Jigsaw
  – Things it already does
  – Helpful suggestions
Final Project

- Demos tomorrow
  - Be on time, respect the 15 minutes
- Video due on Monday
  - Will put them all on a t-square page
- Questions?

- Team survey

Grades

- HWs
- Project
- Participation

- Items will be posted in t-square later next week
Course Survey

- Take a few minutes to complete

- Please remember to complete GT one too!
  - Link from homepage of t-square

InfoVis Gospel

- Hopefully, course has increased your awareness of topic and you can become an advocate

- Keep me posted as your use these ideas in your career