Week 5: Wrangling, Rules of Thumb

Tamara Munzner
Department of Computer Science
University of British Columbia

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http://www.cs.ubc.ca/~tmm/courses/journ16
Whereabouts

• we’re both back, this week and next week
  – standard office hours in Sing Tao this week: 2-3pm
• Tamara gone week after class is over
  – Caitlin available for office hours Oct 25
News

• Stay tuned for Assgn 2/3 marks & quick feedback on proposals
• Today’s format
  – some interleaving of foundations & demos
    • Tamara will talk about rules of thumb
    • Caitlin will talk about wrangling and walk through Tableau demos
    • you follow along step by step on your own laptop
    • Tamara will rove the room to help out folks who get stuck
Rules of Thumb

• No unjustified 3D

• Resolution over immersion
• Overview first, zoom and filter, details on demand
• Responsiveness is required
• Function first, form next
No unjustified 3D: Power of the plane

• high-ranked spatial position channels: **planar** spatial position  
  – not depth!

[Diagram showing Steven’s Psychophysical Power Law: $S = I^N$]

- **Magnitude Channels: Ordered Attributes**
  - Position on common scale
  - Position on unaligned scale
  - Length (1D size)
  - Tilt/angle
  - Area (2D size)
  - Depth (3D position)
No unjustified 3D: Danger of depth

- we don’t really live in 3D: we see in 2.05D
  - acquire more info on image plane quickly from eye movements
  - acquire more info for depth slower, from head/body motion

![Diagram showing 3D perspective]

We can only see the outside shell of the world.
Occlusion hides information

- occlusion
- interaction complexity

Perspective distortion loses information

• perspective distortion
  – interferes with all size channel encodings
  – power of the plane is lost!

[Visualizing the Results of Multimedia Web Search Engines. Mukherjea, Hirata, and Hara. InfoVis 96]
3D vs 2D bar charts

- 3D bars never a good idea!

[http://perceptualedge.com/files/GraphDesignIQ.html]
No unjustified 3D example: Time-series data

- extruded curves: detailed comparisons impossible

[Cluster and Calendar based Visualization of Time Series Data. van Wijk and van Selow, Proc. InfoVis 99.]
No unjustified 3D example: Transform for new data abstraction

- derived data: cluster hierarchy
- juxtapose multiple views: calendar, superimposed 2D curves

[Cluster and Calendar based Visualization of Time Series Data. van Wijk and van Selow, Proc. InfoVis 99.]
Justified 3D: shape perception

- benefits outweigh costs when task is shape perception for 3D spatial data
  - interactive navigation supports synthesis across many viewpoints

Justified 3D: Economic growth curve

No unjustified 3D

• 3D legitimate for true 3D spatial data
• 3D needs very careful justification for abstract data
  – enthusiasm in 1990s, but now skepticism
  – be especially careful with 3D for point clouds or networks

Resolution beats immersion

• immersion typically not helpful for abstract data
  – do not need sense of presence or stereoscopic 3D
• resolution much more important
  – pixels are the scarcest resource
  – desktop also better for workflow integration
• virtual reality for abstract data very difficult to justify

Overview first, zoom and filter, details on demand

• influential mantra from Shneiderman


• overview = summary
  – microcosm of full vis design problem
Responsiveness is required

- three major categories
  - 0.1 seconds: perceptual processing
  - 1 second: immediate response
  - 10 seconds: brief tasks

- importance of visual feedback
Function first, form next

• start with focus on functionality
  – straightforward to improve aesthetics later on, as refinement
  – if no expertise in-house, find good graphic designer to work with

• dangerous to start with aesthetics
  – usually impossible to add function retroactively
Assignment 5

• pair up with partners (your choice)
• explore Angus Reid survey data
  – load data
  – start with workbook
  – explore further
  – write up design and findings
  – note: do not write actual story!