Week 5:
Wrangling, Rules of Thumb

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JRNL 520H, Special Topics in Contemporary Journalism: Data Visualization
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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

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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
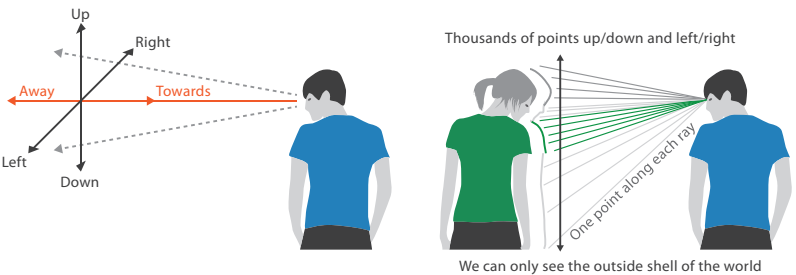 - not depth!
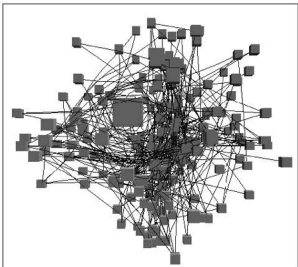

Steven's Psychophysical Power Law: S= I^N
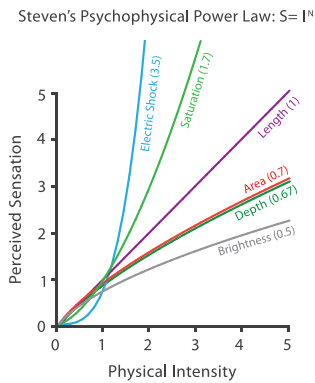
No unjustified 3D: Danger of depth

- 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

Thousands of points up/down and left/right
We can only see the outside shell of the world

Occlusion hides information

- occlusion
- interaction complexity

[Distortion Viewing Techniques for 3D Data. Carpendale et al. InfoVis 1996.]

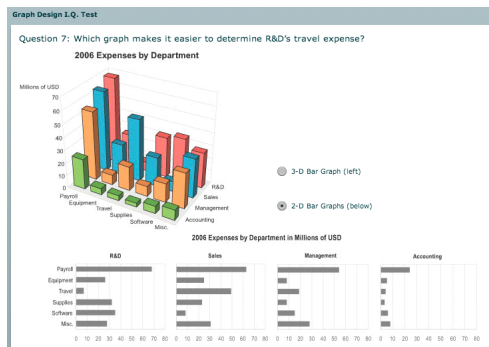## Perspective distortion loses information

- 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]
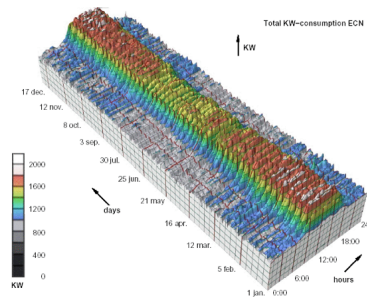

3D vs 2D bar charts

- 3D bars never a good idea!

[http://perceptualedge.com/files/GraphDesignIQ.html]

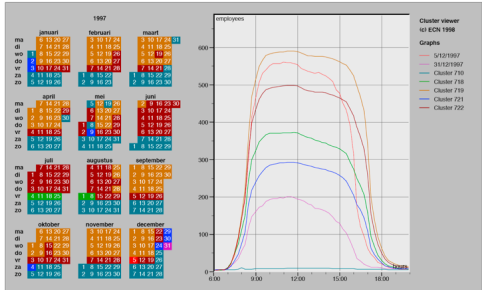## No unjustified 3D example: Time-series data

- 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.]
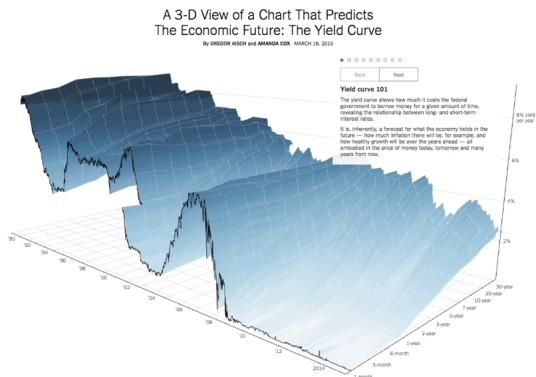

Justified 3D: shape perception

- benefits outweigh costs when task is shape perception for 3D spatial data
  - interactive navigation supports synthesis across many viewpoints
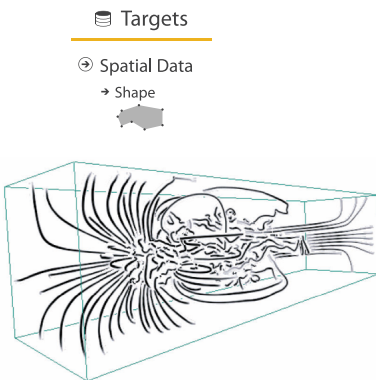
[Image-Based Streamline Generation and Rendering. Li and Shen. IEEE Trans. Visualization and Computer Graphics (TVCG) 13:3 (2007), 630–640.]


Justified 3D: Economic growth curve

A 3-D View of a Chart That Predicts
The Economic Future: The Yield Curve

http://www.nytimes.com/interactive/2015/03/19/upshot/3d-yield-curve-economic-growth.html


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
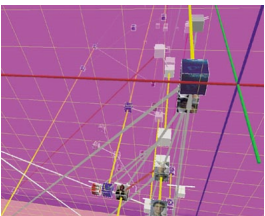
[WEBPATH-a three dimensional Web history. Frecon and Smith. Proc. InfoVis 1999]

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
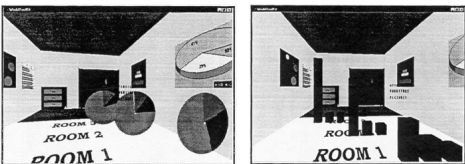
[Development of an information visualization tool using virtual reality. Kirner and Martins. Proc. Symp. Applied Computing 2000]

Overview first, zoom and filter, details on demand

- influential mantra from Shneiderman

[The Eyes Have It: A Task by Data Type Taxonomy for Information Visualizations. Shneiderman. Proc. IEEE Visual Languages, pp. 336–343, 1996.]

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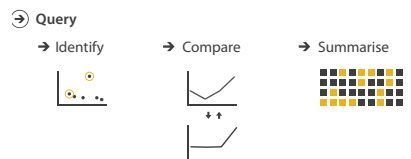
Responsiveness is required

- 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!