

Week 5:

Wrangling, Rules of Thumb

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

Week 5: 11 October 2016

<http://www.cs.ubc.ca/~tmm/courses/journal6>

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!

➔ Magnitude Channels: Ordered Attributes

Position on common scale



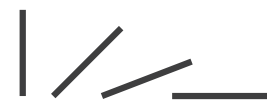
Position on unaligned scale



Length (1D size)



Tilt/angle



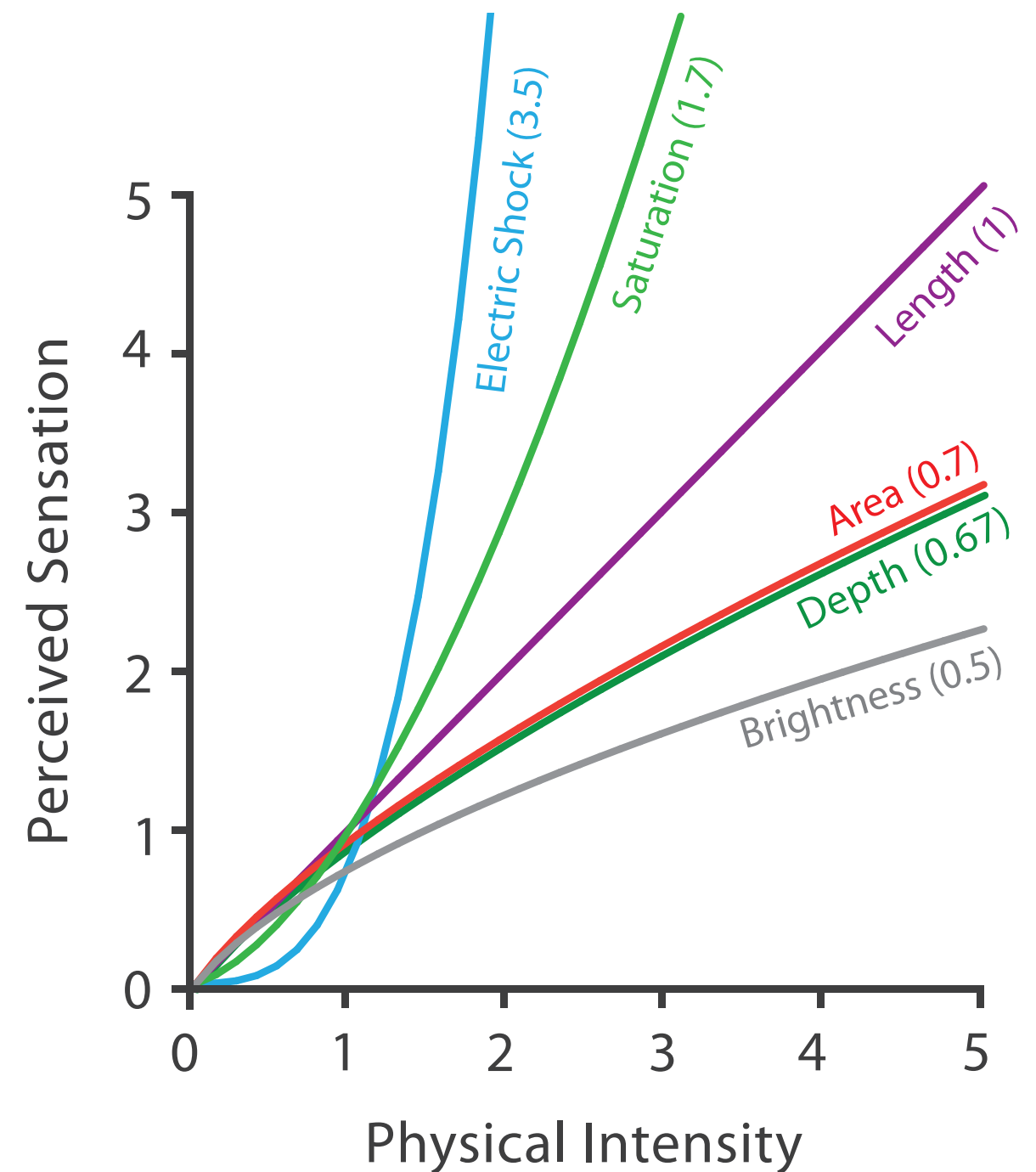
Area (2D size)



Depth (3D position)

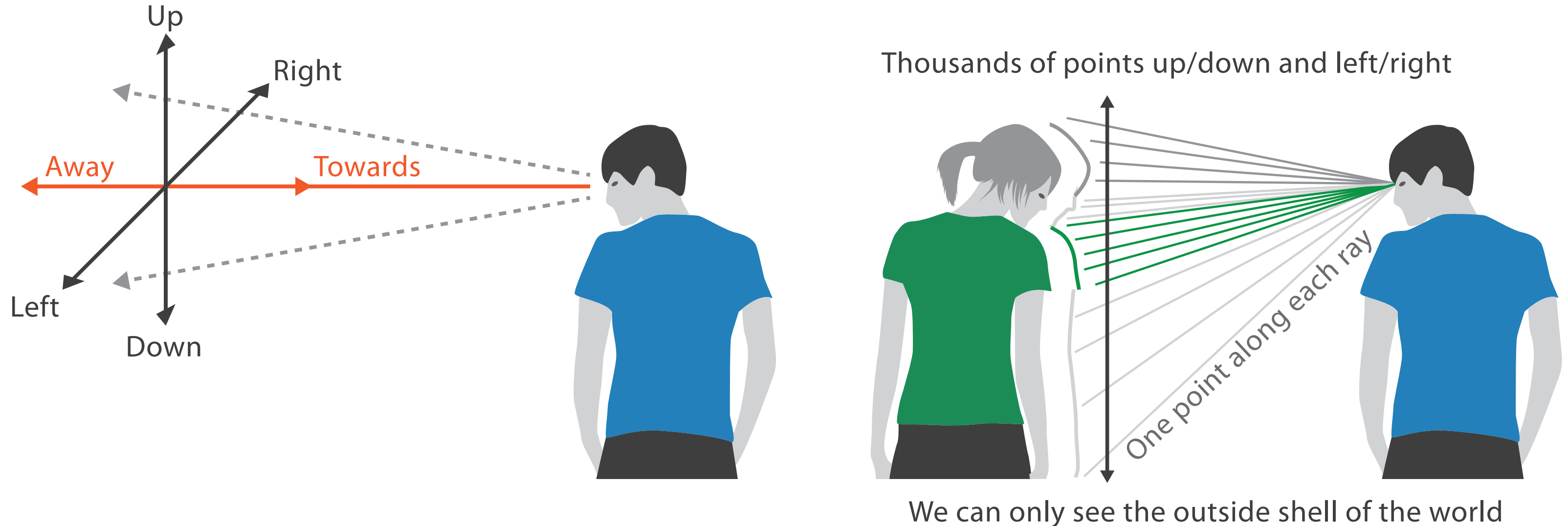


Steven's Psychophysical Power Law: $S = I^N$



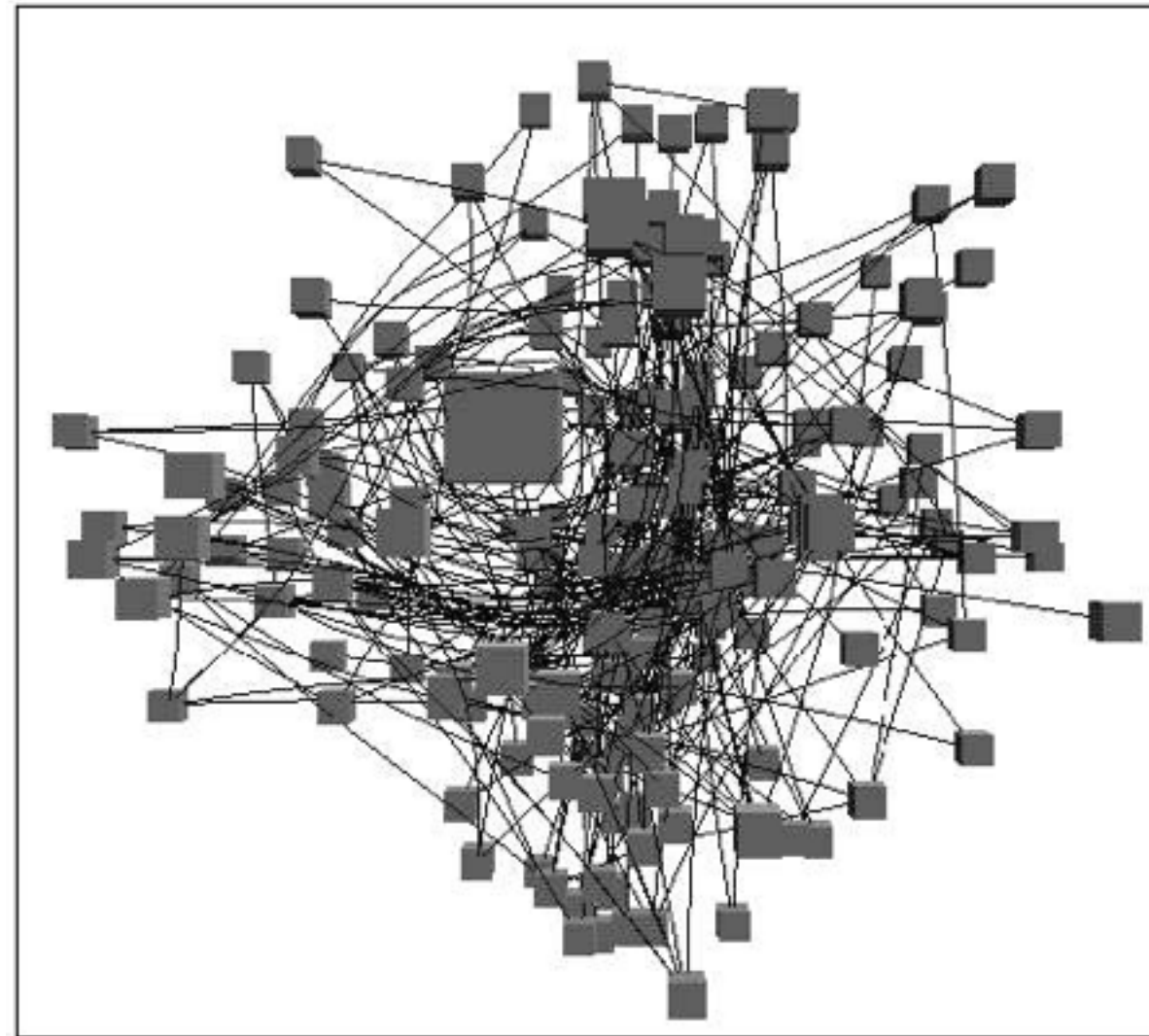
No unjustified 3D: Danger of depth

- 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



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]*

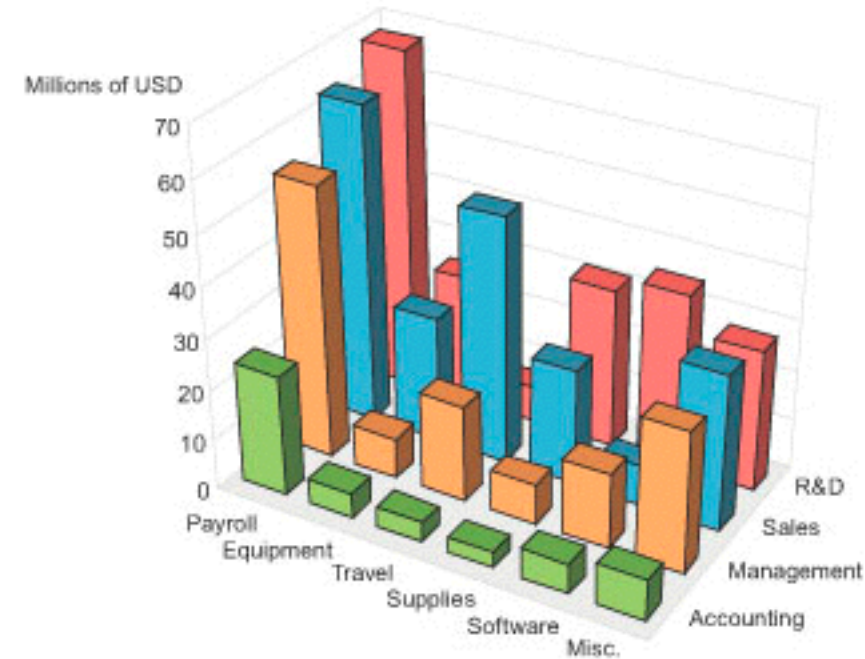
3D vs 2D bar charts

- 3D bars never a good idea!

Graph Design I.Q. Test

Question 7: Which graph makes it easier to determine R&D's travel expense?

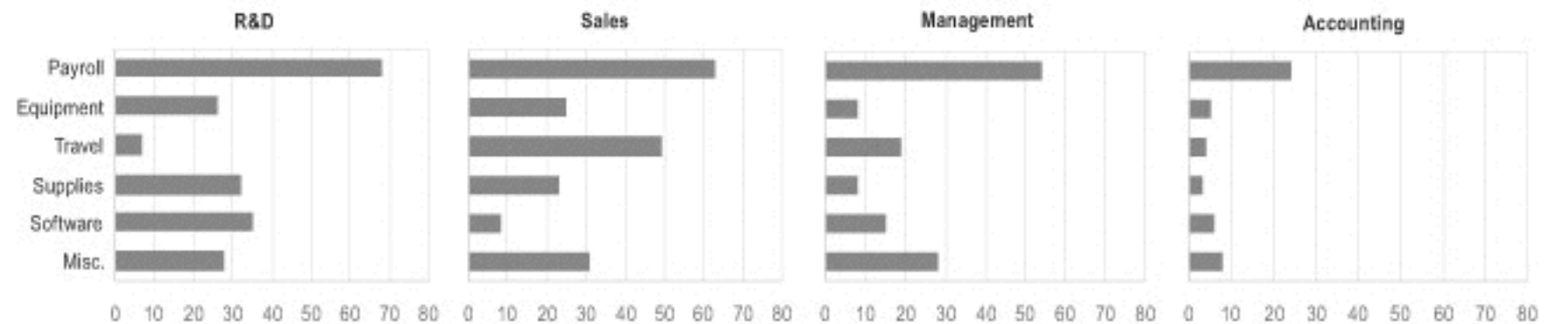
2006 Expenses by Department



3-D Bar Graph (left)

2-D Bar Graphs (below)

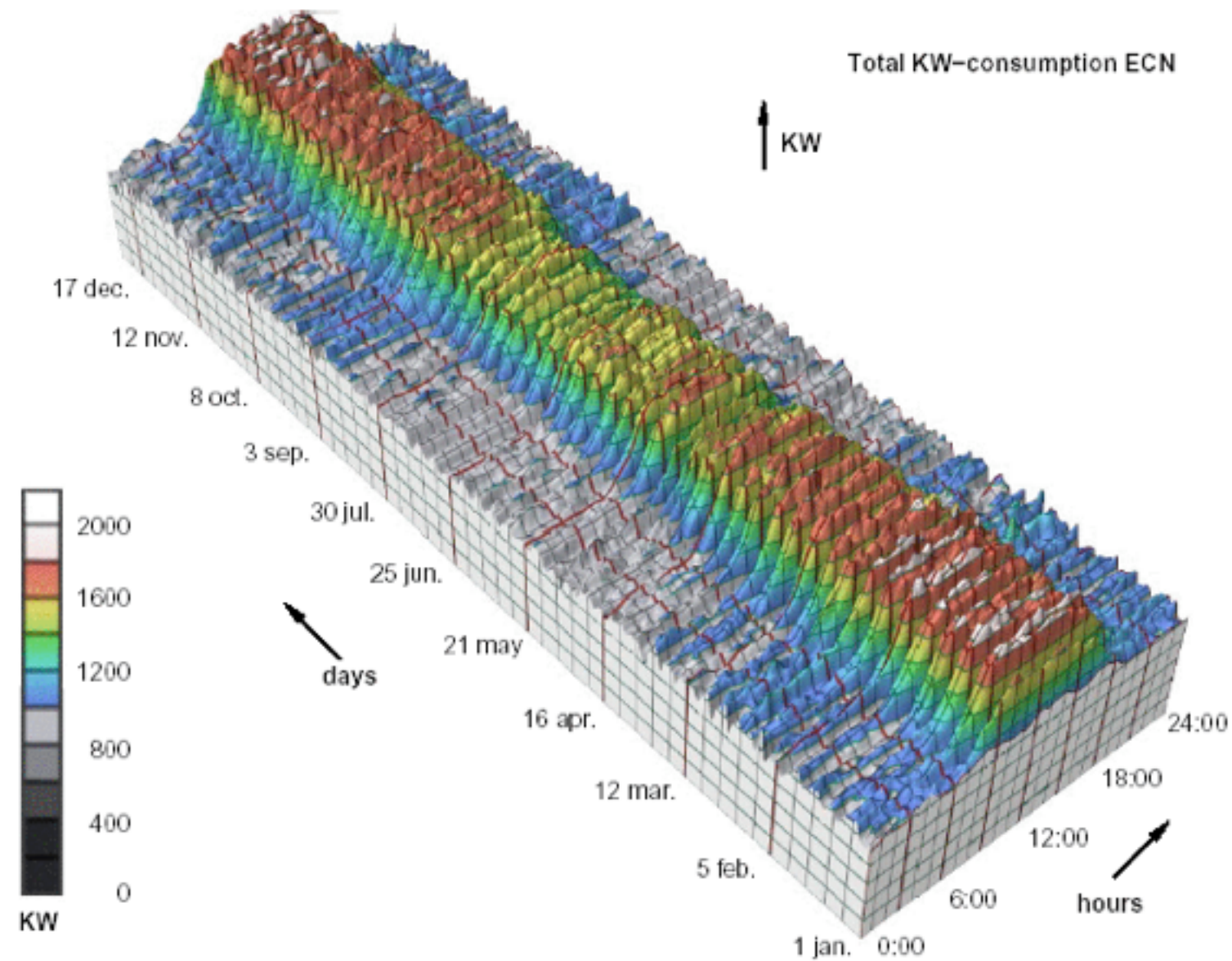
2006 Expenses by Department in Millions of USD



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

No unjustified 3D example: Time-series data

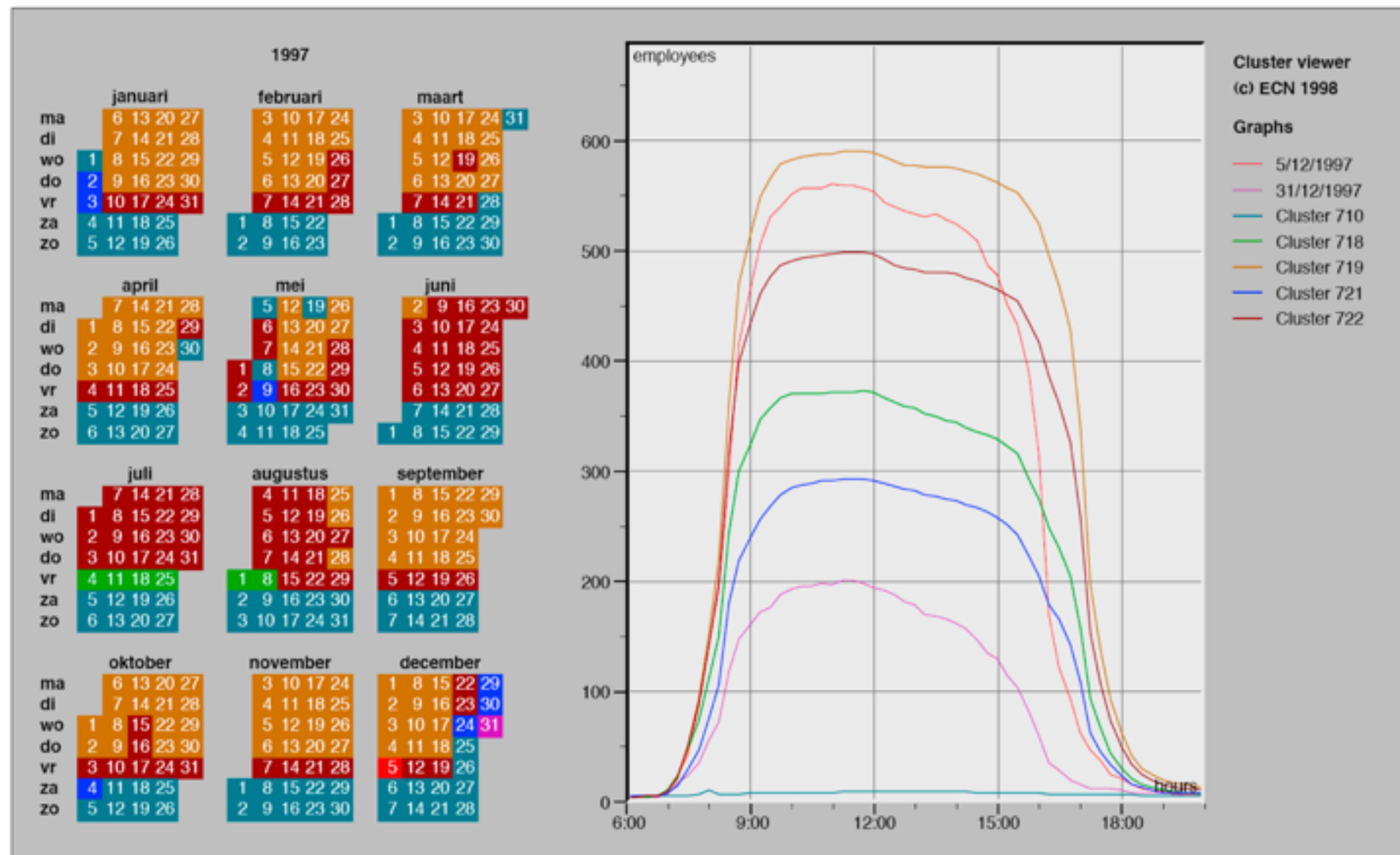
- extruded curves: detailed comparisons impossible



[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.]

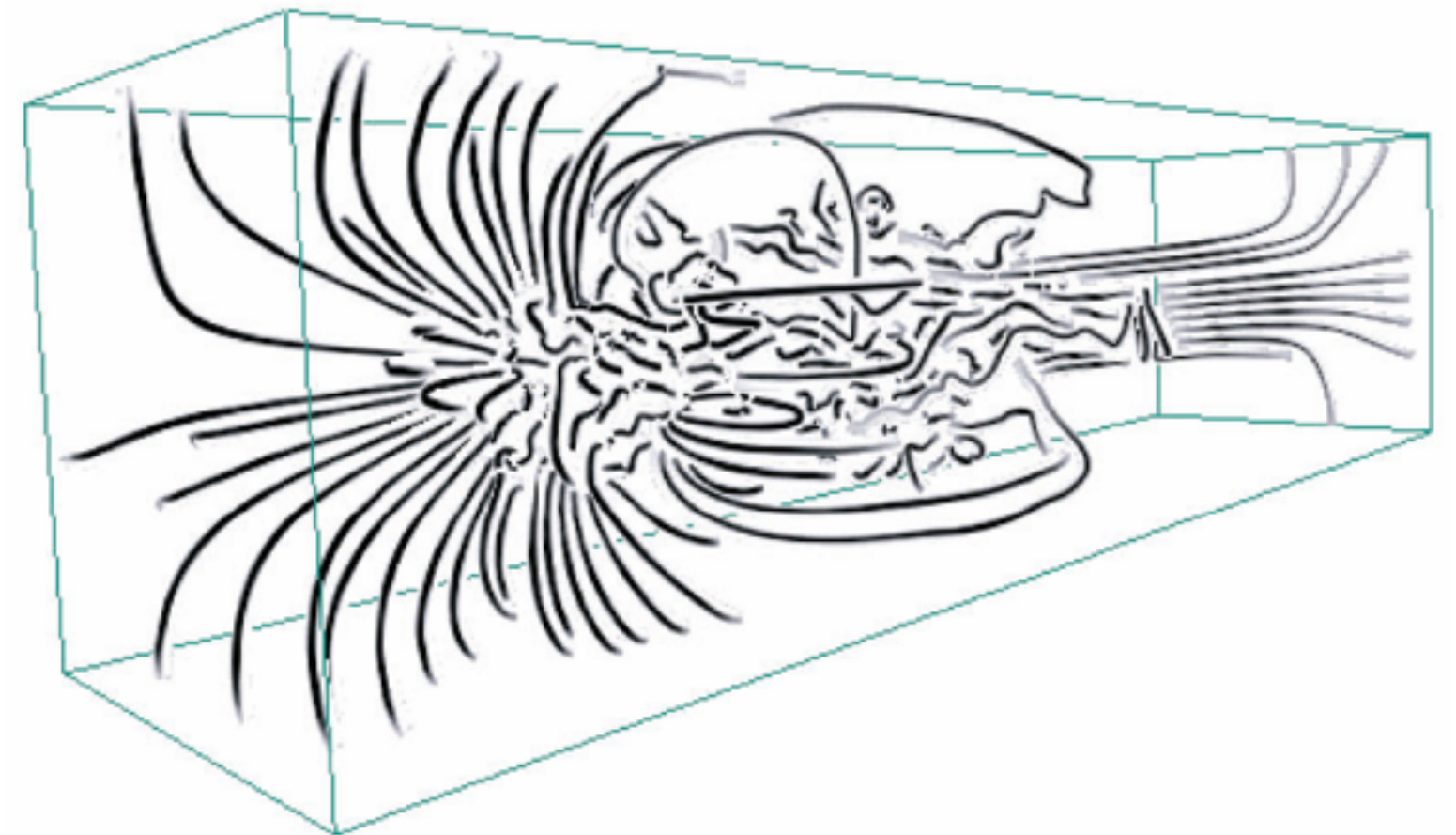
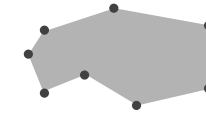
Justified 3D: shape perception

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

 Targets

⊙ Spatial Data

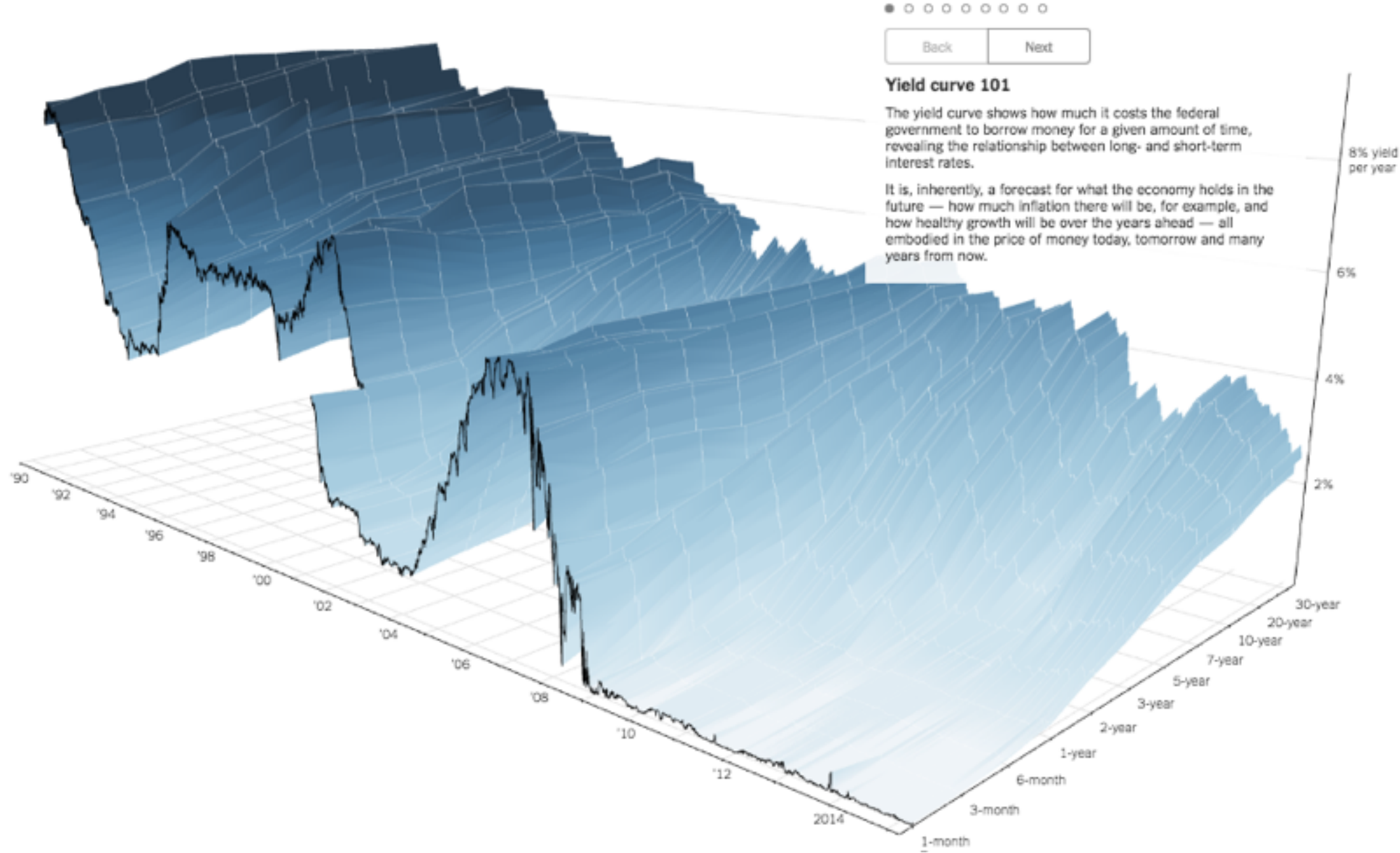
→ Shape



Justified 3D: Economic growth curve

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

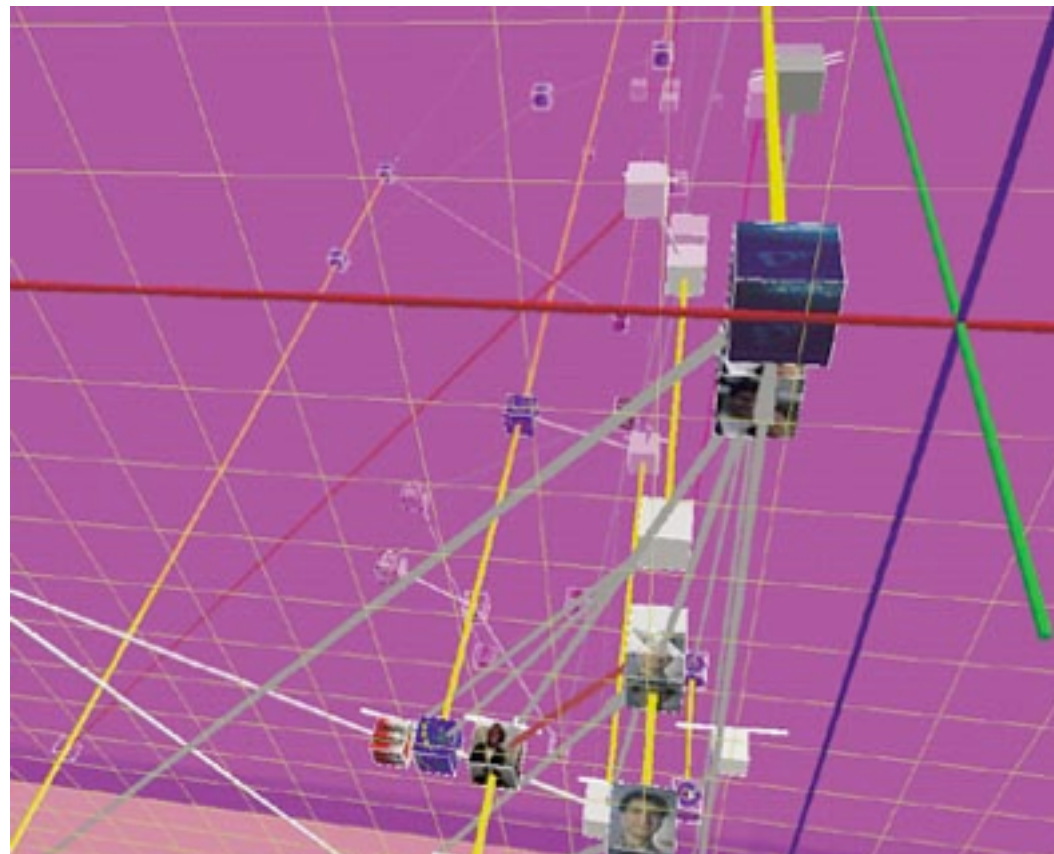
By GREGOR AISCH and AMANDA COX MARCH 18, 2015



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

No unjustified 3D

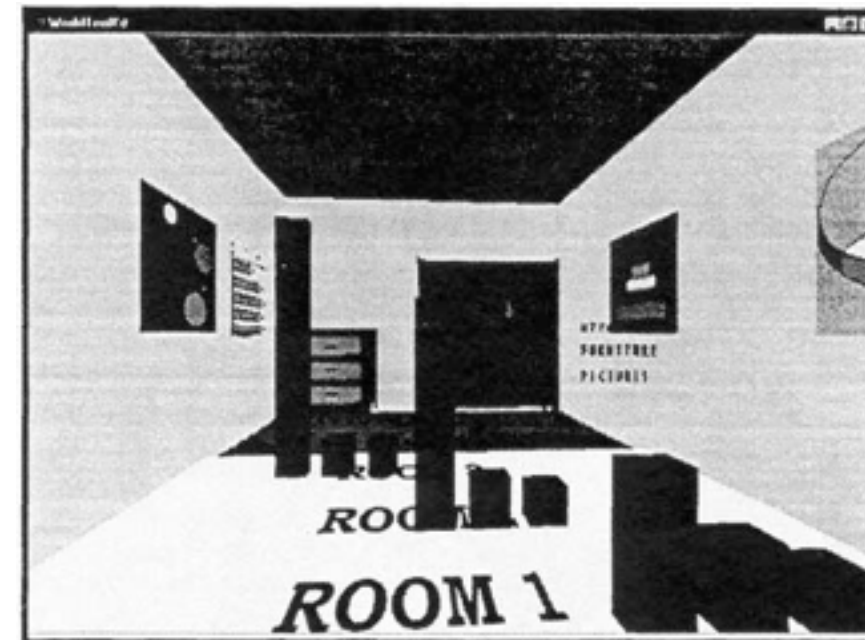
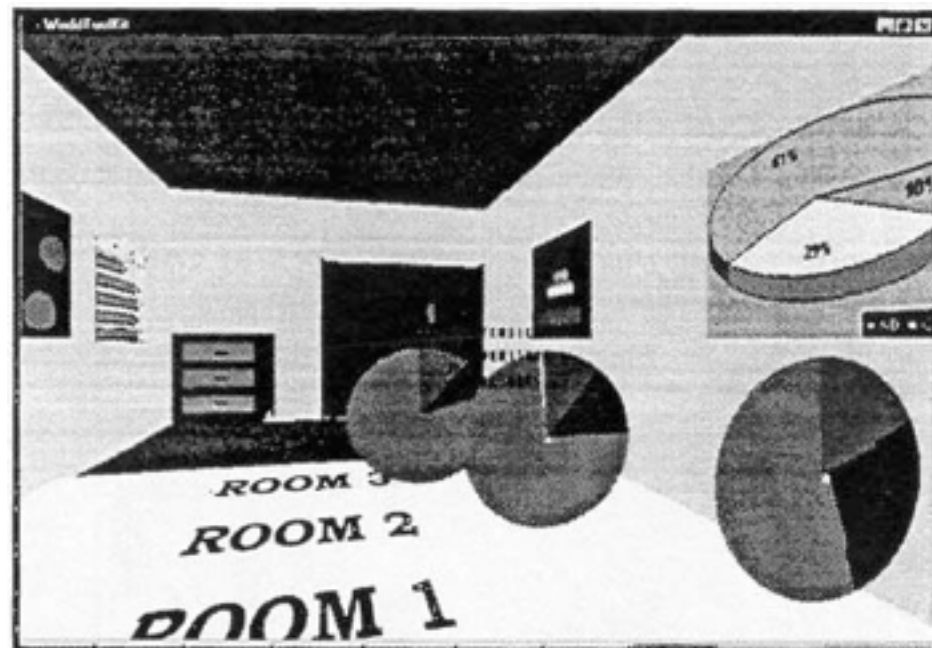
- 3D legitimate for true 3D spatial data
- 3D needs very careful justification **for abstract data**
 - enthusiasm in 1990s, but now skepticism
 - be especially careful with 3D for point clouds or networks



[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

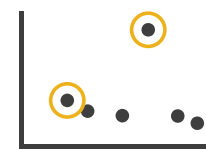
- influential mantra from Shneiderman

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

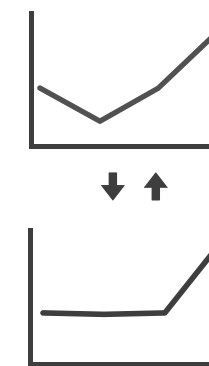
- **overview = summary**
 - microcosm of full vis design problem

→ Query

→ Identify



→ Compare



→ Summarise



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!