Tufte’s Design Principles III

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Based on slides from John Stasko, GTECH
Design Principles

Escape flatland – small multiples, parallel sequencing

- Data is multivariate
- Doesn’t necessarily mean 3D projection
- How can we enhance multivariate data on inherently 2D surfaces?
Small Multiples

Image: Vol 2, page 28
Parallel Sequencing

Image: Vol 2, page 23
Parallel Sequencing

Image: Vol 1, page 164
Tufte- Macro/Micro

Provide the user with both views (overview + detail)

Carefully designed view can show a macro structure (overview) as well as micro structure (detail) in one space.
Tufte- Utilize Layering & Separation

Supported by Gestalt laws
- Grouping with colors
- 1+1 = 3 (clutter)
- Using Color to separate
  - Less noisy than grid lines
Design Principles

Utilize narratives of space and time

Tell a story of position and chronology through visual elements

http://guns.periscopic.com/?year=2013

http://www.arbordoctor.net/japanesebeetle.html
Design Principles

Content is king

Quality, relevance and integrity of the content is fundamental

What’s the analysis task? Make the visual design reflect that

Integrate text, chart, graphic, map into a coherent narrative
Graph and Chart Tips

Avoid separate legends and keys -- Just have that information in the graphic.
Make grids, labeling, etc., very faint so that they recede into background.

Image: Vol 2, page 63
Using Color Effectively

“The often scant benefits derived from coloring data indicate that even putting a good color in a good place is a complex matter. Indeed, so difficult and subtle that avoiding catastrophe becomes the first principle in bringing color to information: Above all, do no harm.”
Proper Color Use

To label (nominal )
To measure (quantitative)
To represent or imitate reality
To enliven or decorate

Image : Vol 1, page 176
1. “Bright, strong colors have loud, unbearable effects when they stand unrelieved over large areas adjacent to one another, but extraordinary effects can be achieved when they are used sparingly on or between dull background tones” Vol2, pg. 82

2. “The placing of light bright colors mixed with white next to each other usually produces unpleasant results, especially if the colors are used for large areas” Vol2 pg. 82
Color Rules

3. Large background colors should be quiet, muted to let brighter colors stand out.
ColorBrewer: Sequential (Ordinal)

http://colorbrewer2.org/
ColorBrewer: Qualitative (Nominal)

http://colorbrewer2.org/
ColorBrewer: Diverging

http://colorbrewer2.org/
Guides for Enhancing Visual Quality

Attractive displays of statistical info

have a properly chosen format and design
use words, numbers and drawing together
reflect a balance, a proportion, a sense of relevant scale
display an accessible complexity of detail
often have a narrative quality, a story to tell about the data
are drawn in a professional manner, with the technical details of production done with care
avoid content-free decoration, including chartjunk
Graphical Excellence

Show the data
Guide viewer to substance, not method
Avoid distorting
Many #’s in small space
Make LARGE datasets coherent
Encourage comparison of pieces of data
Multiple levels of detail
Know your purpose
Integrate with stats/text descriptions