CIS 467/602-01: Data Visualization

D3 Colormaps

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Colormaps Overview

[Colormaps Overview diagram showing different categories: Binary, Categorical, Diverging, Sequential.]

[Munzner (ill. Maguire), 2014]
Continuous Colormap

US EPA Regional Oxidant Model -- Midwest
Ozone (ppbv): June 26, 1987, 18:00

[Bergman et al., 1995]
Segmented Colormap

US EPA Regional Oxidant Model -- Midwest
Ozone (ppbv): June 26, 1987, 18:00

[Bergman et al., 1995]
Rainbow Colormap

Obama & Romney Tweets (2012 Election)

[A. C. Robinson, 2012]
Single-Hue Colormap

Obama & Romney Tweets (2012 Election)

[A. C. Robinson, 2012]
Matlab parula colormap

[S. Eddins (Matlab Blog), 2014]
"Get It Right in Black and White" - M. Stone

Matlab parula colormap (B&W)

[S. Eddins (Matlab Blog), 2014]
Mapping Other Channels

- Size channels: length better than area better than volume
- Angle channel: our perception of angle is **not uniform**
  - Tiltmaps map values to angles
  - Similar notions of sequential and diverging, also cyclic

![Sequential](line mark or arrow glyph)  ![Diverging](arrow glyph)  ![Cyclic](arrow glyph)
Mapping Other Channels

- Curvature: not very accurate, similar to volume

- Shape
  - Difference between shape that contain area and those made of lines
  - Works with higher-level vision processing (edge detection, etc.)

- Motion channels:
  - Direction, velocity, and frequency
  - Less studied
  - Beware change blindness

- Texture and Stippling:
  - Texture: complex and involves orientation, scale, and contrast
  - Stippling (aka hatching), from printing, not used as much today
D3 Scales

- Map a domain to a range
- Use these with axes
  - `var x= d3.scale.linear().domain([100,400]).range([0,200]);`
- Takes a domain and maps it to a range in the way specified by the type of scale (e.g. linear, log, ordinal)
- Ordinal scales: map discrete data
- Quantitative scales: map continuous data
  - linear, identity, pow, log
  - allow interpolator functions to be specified
- Also: quantize, quantile, and threshold scales
D3 Colormaps

- Domains and ranges don't need to be numbers!
  - Ranges can be colors

**categorical colors**

category10

```
https://github.com/mbostock/d3/wiki/Ordinal-Scales#categorical-colors
```

[https://bl.ocks.org/aaizemberg/78bd3dade9593896a59d](https://bl.ocks.org/aaizemberg/78bd3dade9593896a59d)
Categorical Colormap Example

- Each state's most common food stop based on OpenTable data

[http://blog.estately.com/2014/07/the-geography-of-each-u-s-states-favorite-food/]