IS590DV Week5 Note taking

Warm up activity:

1. What is the visualization trying to show?

   Color trends in movie posters since 1914.

2. What are its methods?

   At first, ignoring black and white colors, the saturation and lighting were the weighted average for all matching pixels.

   Secondly, ignoring the lightness and saturation, which could make a similar unified view.

3. What are the strengths / weaknesses?

   The similar unified view made the whole distribution more clear.

   The average “darkness” are hidden, which made the image lose some details.

   The average is weighted not actual value.

Topics:

- Transformations
- Colors
- Color mapping
- Data Characteristics
- Choosing Visualizations

Transformations:

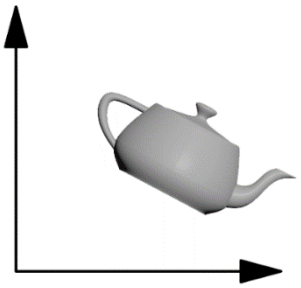
Affine transformations satisfy:

$$\vec{y} = A\vec{x} + \vec{b}$$

To accomplish:

- Shifts
- Rotations
- Scaling

Example:



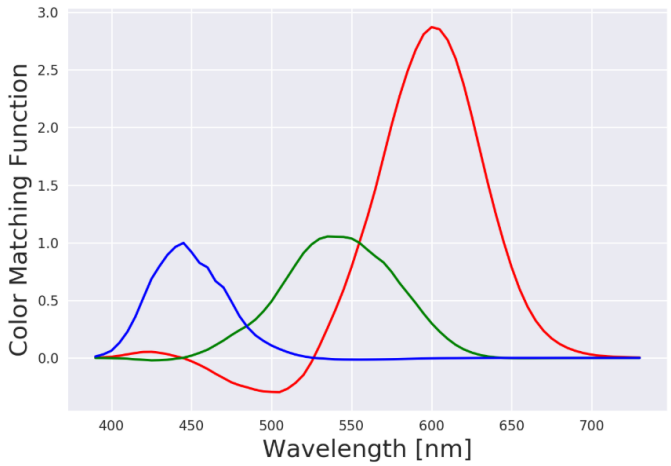
Choosing a Visualization:

- Does this data describe a geometric object?
- Are the data points connected to each other?
- Can we describe data points with a fixed set of categories?
- Is there a quantity associated with the data?
- Are the datapoints continuous along one or more dimensions?

Categories and Continuity

How Do Colors Work?

Color Matching Function:



"Naming" Colors:

- RGB triplets, sometimes compressed into hexadecimel ("#00FFAA", etc)
- Color spaces

- HSV (Hue, saturation, value)
- CIELAB
- sRGB, Adobe sRGB

- List of colors by name
  - Web
  - matplotlib

Color Palettes:

- Resources:
  - colorbrewer
  - palettable (package)
- Different Colormaps:
  1. Sequential Colormaps
  2. Diverging Colormaps
  3. Qualitative Colormaps

Color Meaning

HSV Wheel

Magenta

Palette Mapping: Assign each value to a specific color or element.

Color Mapping : $f(v) \rightarrow (R,G,B)$

re-map: $f(v') \rightarrow (R,G,B)$

$v' = f(v)$

For instance, with logs or squares.

Color Mapping: Linear Mapping

We map from a range of values to (0, 1):

$$v' = (v - v0)/(v1 - v0)$$

RGB Components & Color Blindness

Colormaps: Loading Data

Prep Work

Colormaps:

Group Activity - with the Michigan data and the scan data, evaluate:

- How to choose a colormap
- What are some good "bounds" for that colormap
- How do we set our transform?