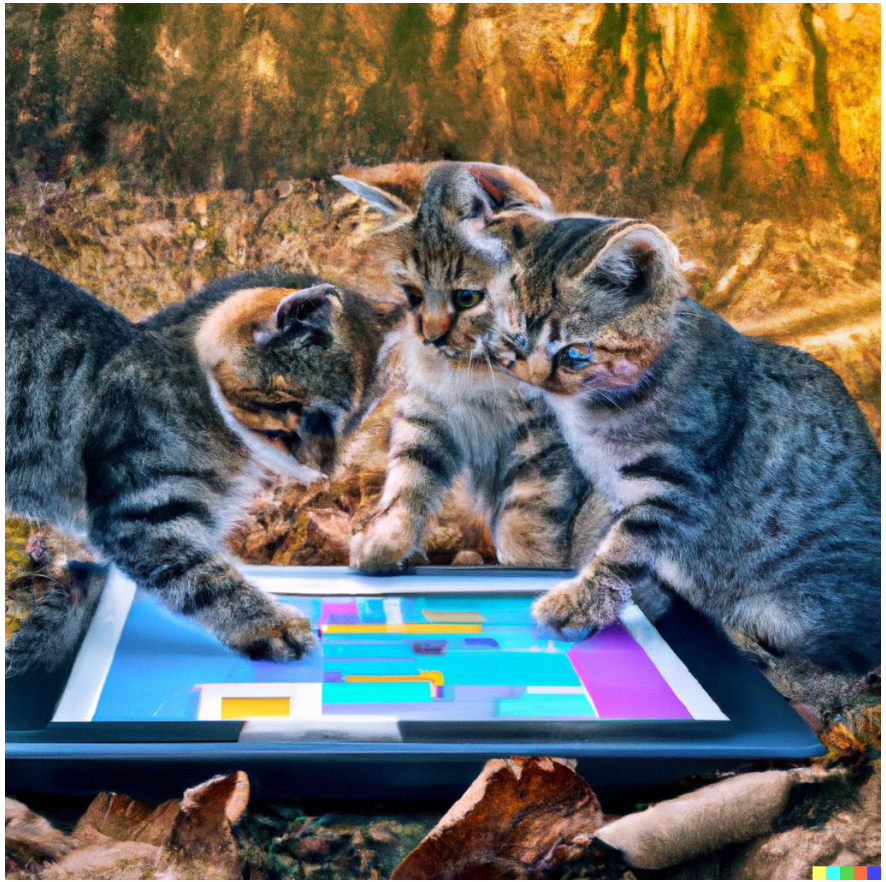
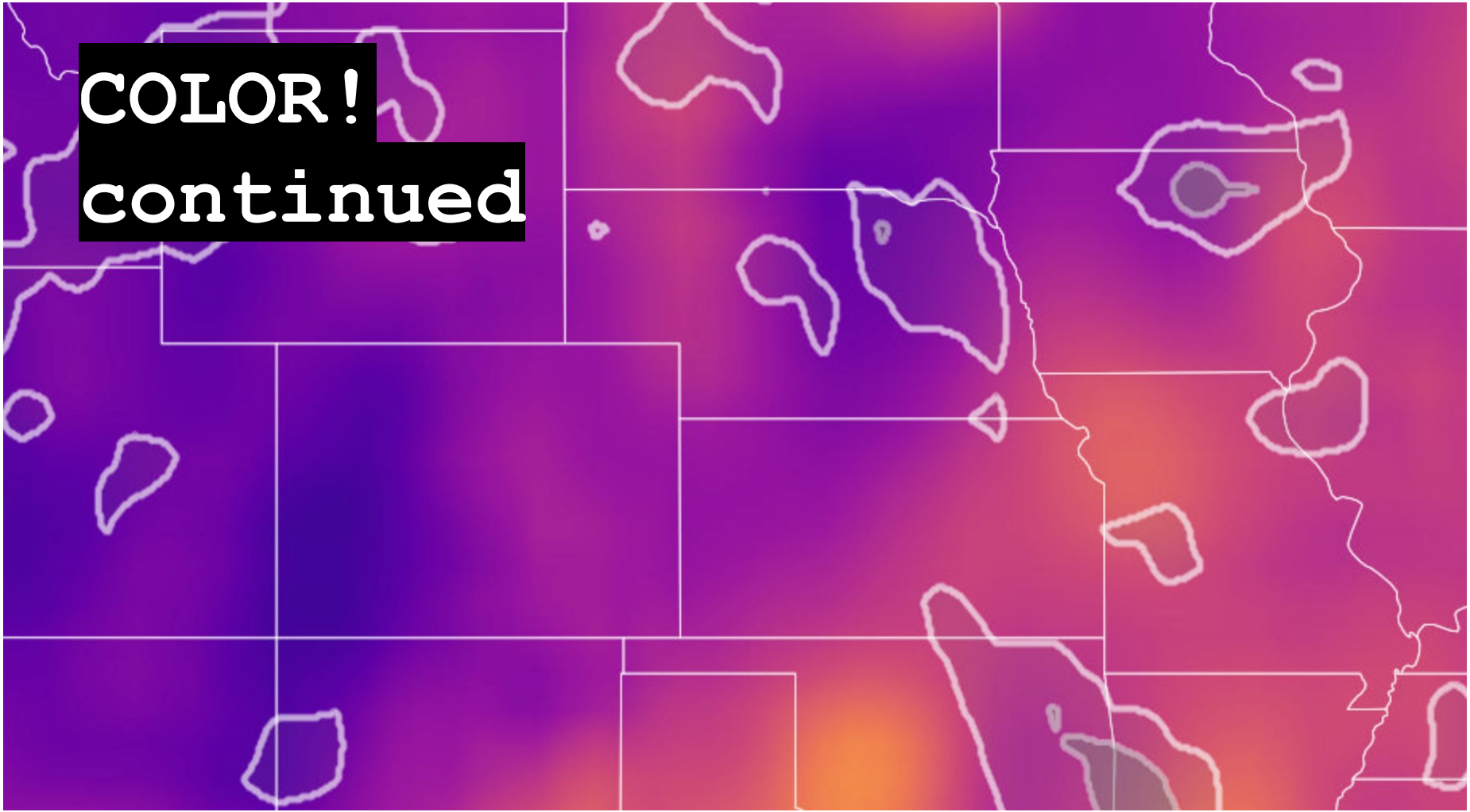
FALL 2025
DSE 12700
VISUAL ANALYTICS

Professor
Madeline Blount
she/her

Week 6



Dall-E2, tabby kittens creating colorful digital charts in a forest, photorealistic style


COLOR!
continued

ALL AESTHETIC ELEMENTS HAVE COLOR!

What kind of **DATA** do you **have**?

What kind of **COLOR** do you **NEED**?

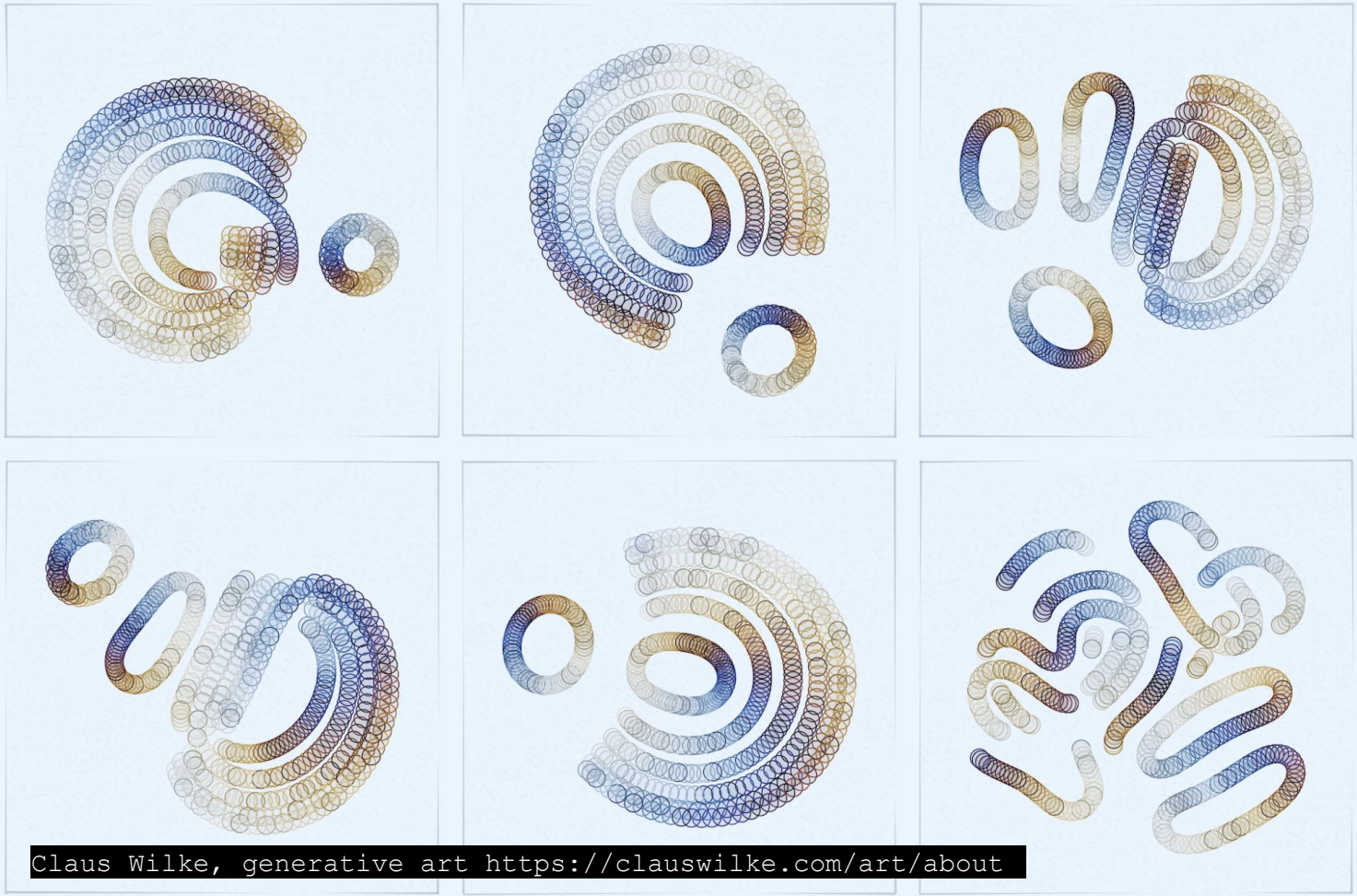
Claus O. Wilke

Professor of Integrative Biology

The University of Texas at Austin

"Data visualization is part art and part science. The challenge is to get the art right without getting the science wrong and vice versa."

-Fundamentals of Data Visualization


Claus Wilke, generative art https://clauswilke.com/art/about

3 functions (Wilke):

Distinguish

- Qualitative color (maps)

Represent value

- Sequential color, or divergent

Highlight

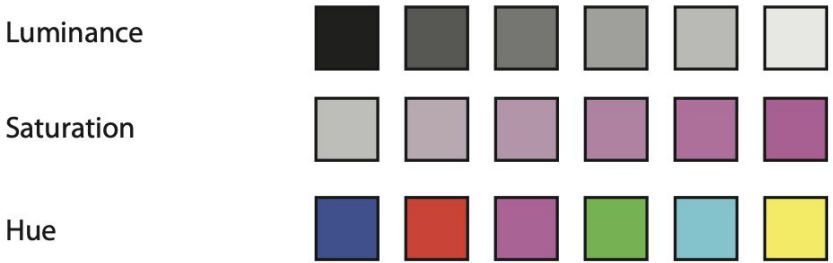
- Accent color

HUE - color identity, categorical

SATURATION - how MUCH color, magnitude

LIGHTNESS - how MUCH brightness, magnitude (allows us to see edges)

https://www.hsluv.org



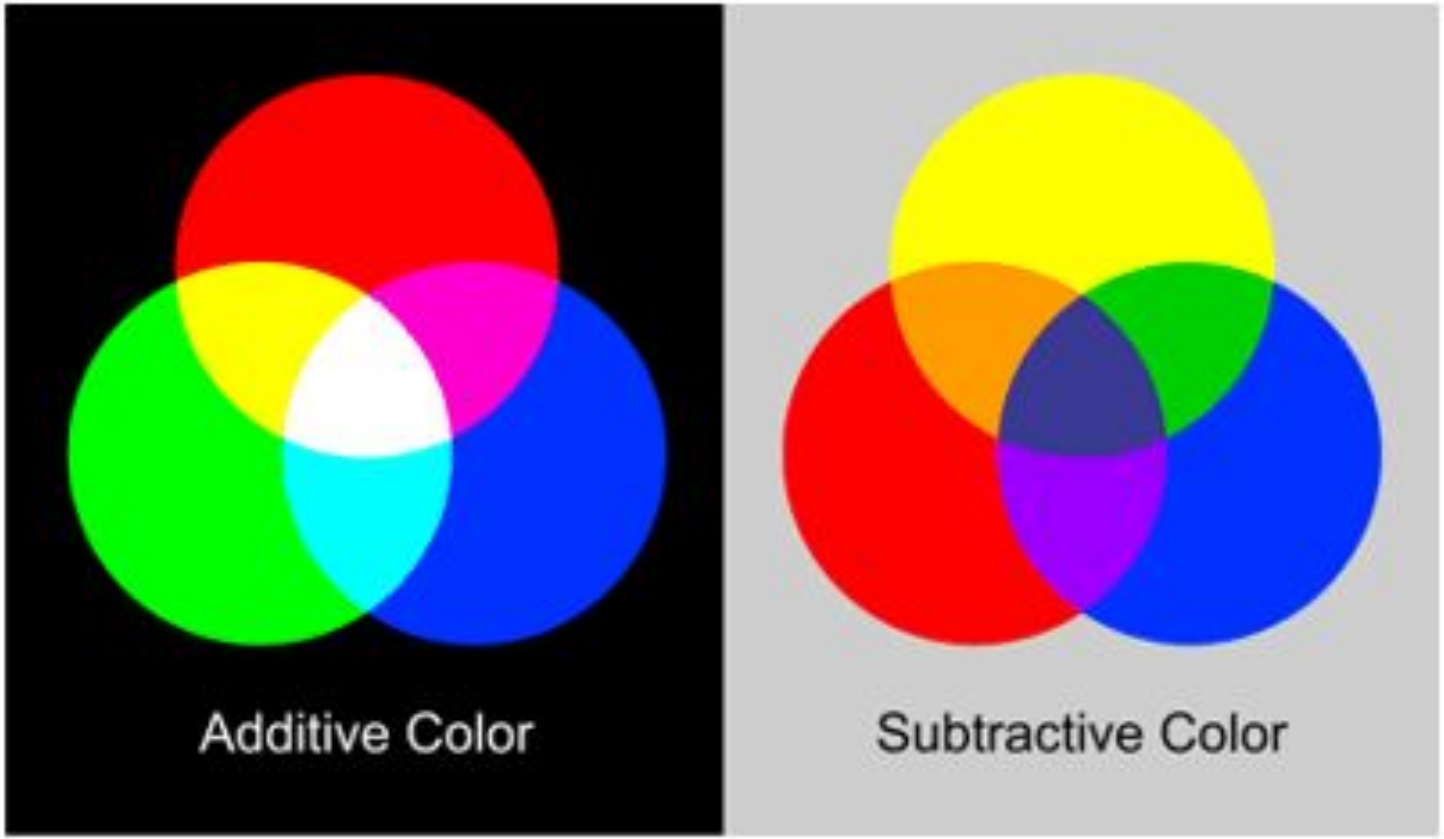
COLOR SPACES:

RGB = (red, green, blue)

RGBA = (red, green, blue, alpha)

HEX = hexadecimal number representation of same information

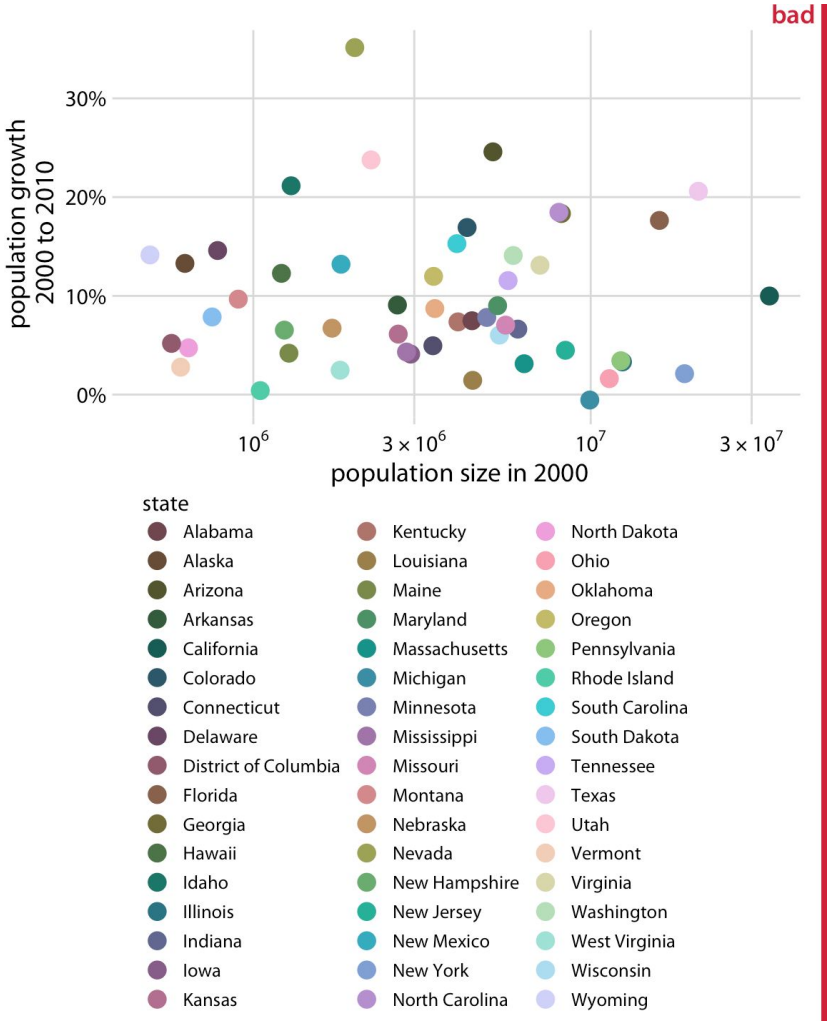
https://htmlcolorcodes.com/color-picker/


Additive Color
Subtractive Color

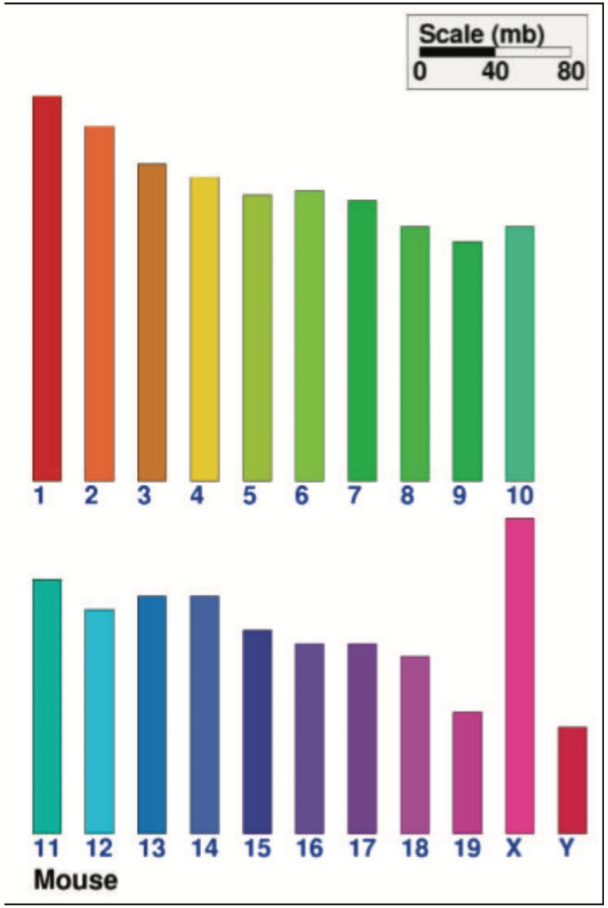
⚠️ Tufte: “do no harm!”

Easy to make mistakes with color …

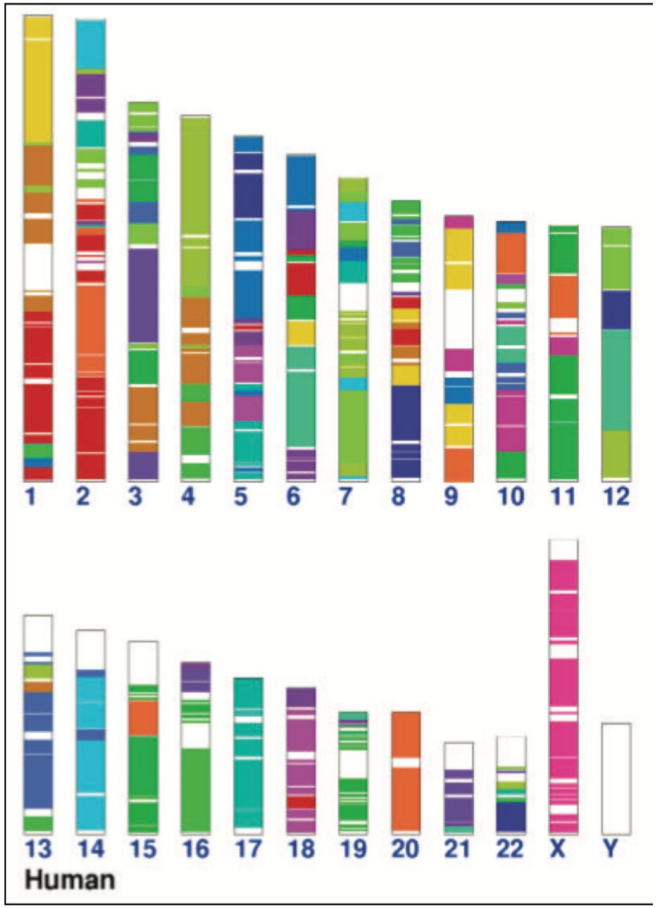
“Discriminable bins” - Munzner


bad
30%
20%
10%
0%
population growth
2000 to 2010
10^6
3×10^6
10^7
3×10^7
population size in 2000
state
Alabama
Alaska
Arizona
Arkansas
California
Colorado
Connecticut
Delaware
District of Columbia
Florida
Georgia
Hawaii
Idaho
Illinois
Indiana
Iowa
Kansas
Kentucky
Louisiana
Maine
Maryland
Massachusetts
Michigan
Minnesota
Mississippi
Missouri
Montana
Nebraska
Nevada
New Hampshire
New Jersey
New Mexico
New York
North Carolina
North Dakota
Ohio
Oklahoma
Oregon
Pennsylvania
Rhode Island
South Carolina
South Dakota
Tennessee
Texas
Utah
Vermont
Virginia
Washington
West Virginia
Wisconsin
Wyoming

Wilke, Ch. 19

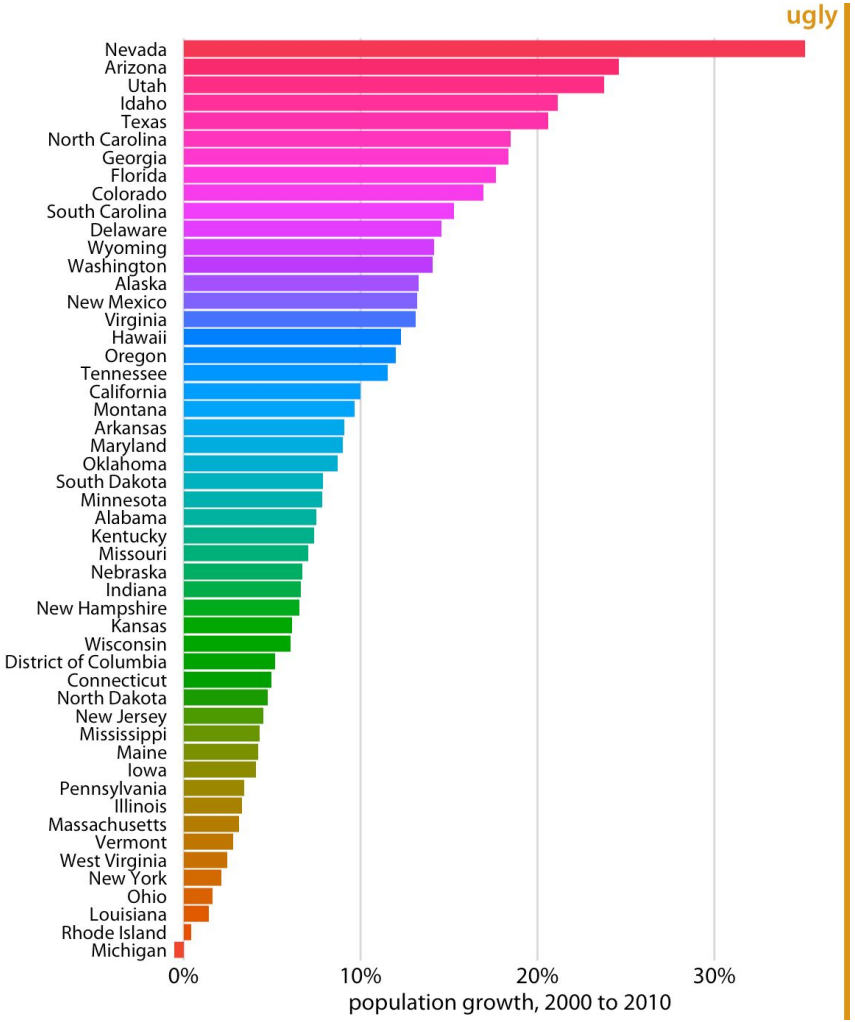


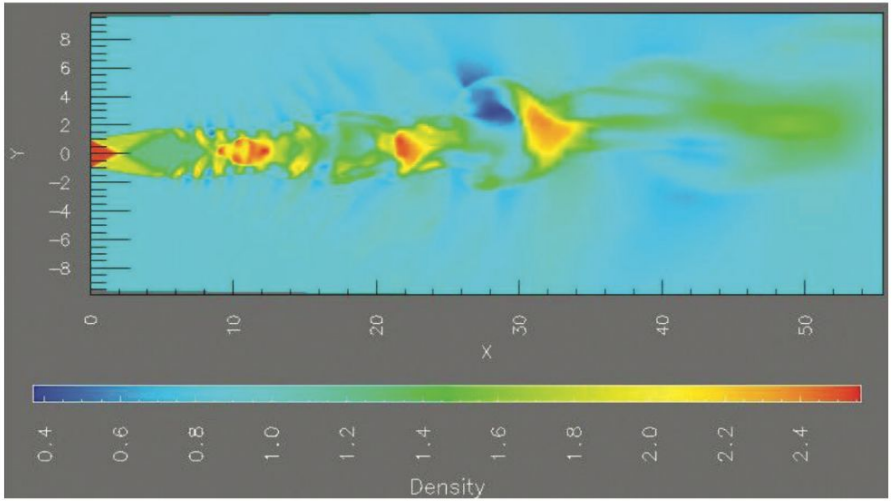
(a)

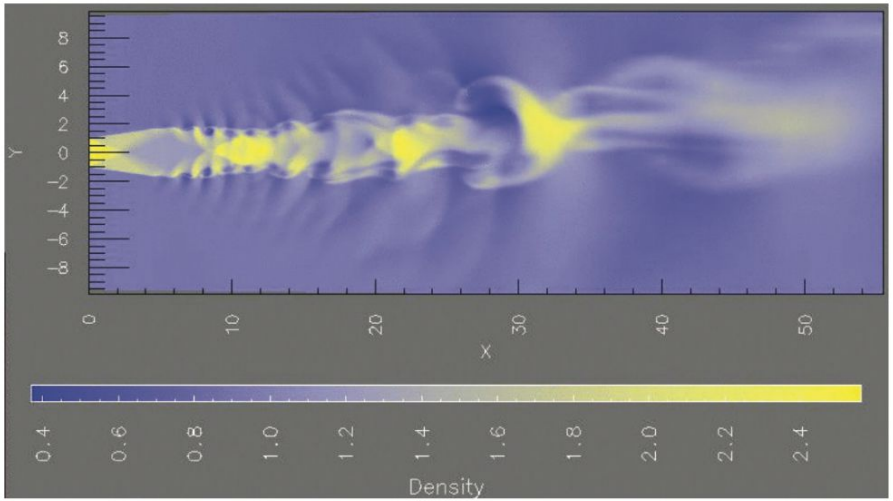


(b)

Munzner, Ch. 10


ugly
Nevada
Arizona
Utah
Idaho
Texas
North Carolina
Georgia
Florida
Colorado
South Carolina
Delaware
Wyoming
Washington
Alaska
New Mexico
Virginia
Hawaii
Oregon
Tennessee
California
Montana
Arkansas
Maryland
Oklahoma
South Dakota
Minnesota
Alabama
Kentucky
Missouri
Nebraska
Indiana
New Hampshire
Kansas
Wisconsin
District of Columbia
Connecticut
North Dakota
New Jersey
Mississippi
Maine
Iowa
Pennsylvania
Illinois
Massachusetts
Vermont
West Virginia
New York
Ohio
Louisiana
Rhode Island
Michigan
0%
10%
20%
30%
population growth, 2000 to 2010





Munzner, Ch. 10

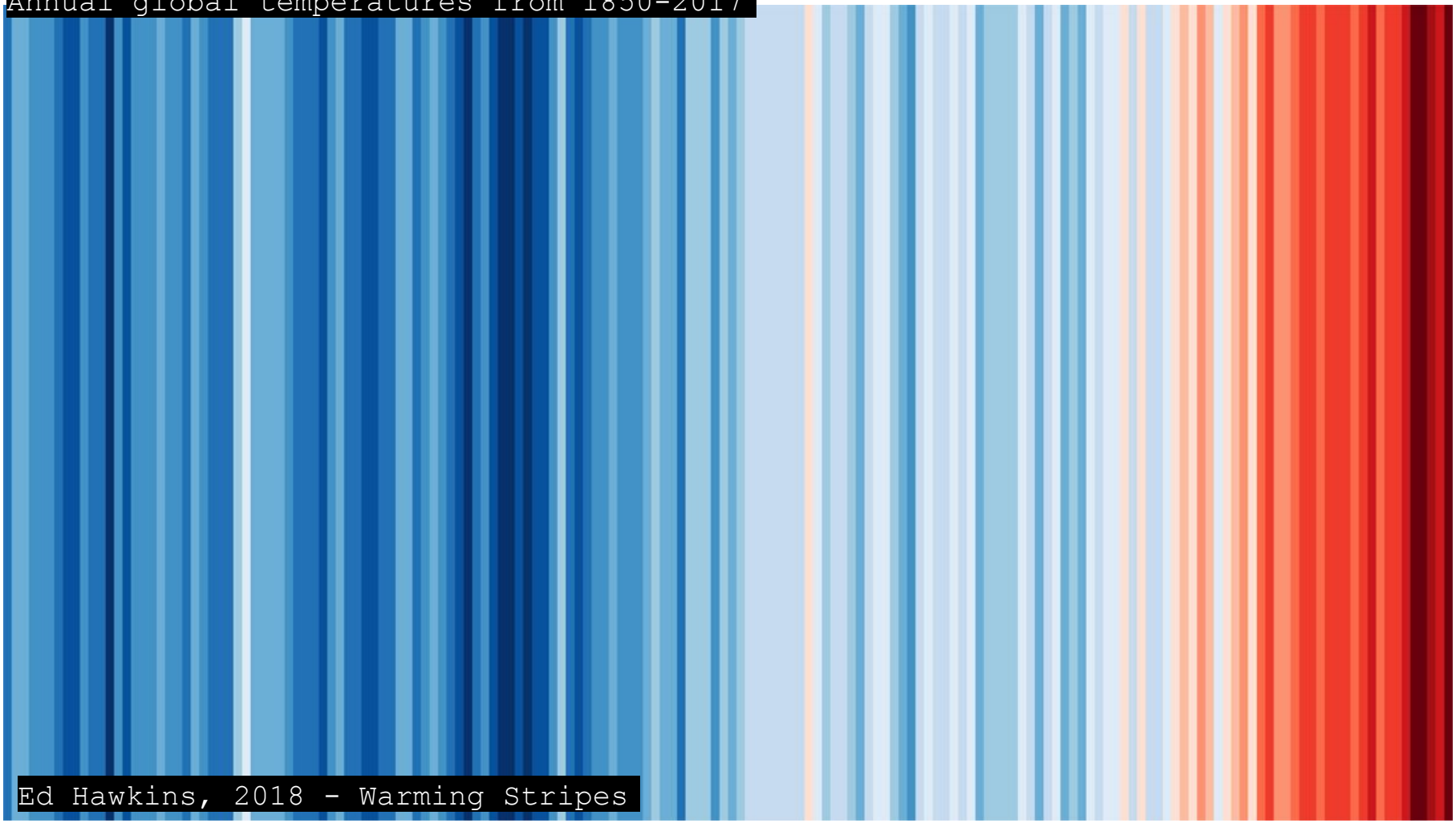
👍 A few rules of thumb:

- Human perception of color is based on relative comparisons, and is drawn to edges.
- And we don't naturally understand rainbows! (everyone)
- Only ~6-12 "bins" for categorical data (Munzner)
  - Use labeling instead of colors after 8 categorical items (Wilke)
- We see more colors in continuous data, but *not linearly* (Munzner)
- "Use bright sparingly" (Tufte)
- Operate within other constraints!

👍 A few rules of thumb:

- Some of this we learn through rules.
- Some of this we learn through examples.
- A lot of this we learn through tinkering and making our own mistakes!
- We don’t have to reinvent the wheel!

- https://colorbrewer2.org
- http://colormind.io


Annual global temperatures from 1850-2017
Ed Hawkins, 2018 - Warming Stripes

2012, Michael Waskom

🧹 housekeeping! coming up:

- **MOVE CLASS**, Oct. 15th (W) -> Oct. 17 (F), MUSEUM
- **ZOOM DAYS**, Nov. 5th and Nov. 26th (see syllabus)
- **Project #2!**: due Oct. 21st by 11:59pm
  - posted in syllabus, including dataset
  - due date moved to 21st
  - light reading next week, work on this instead!
  - but please do the interactivity reading the week after :)