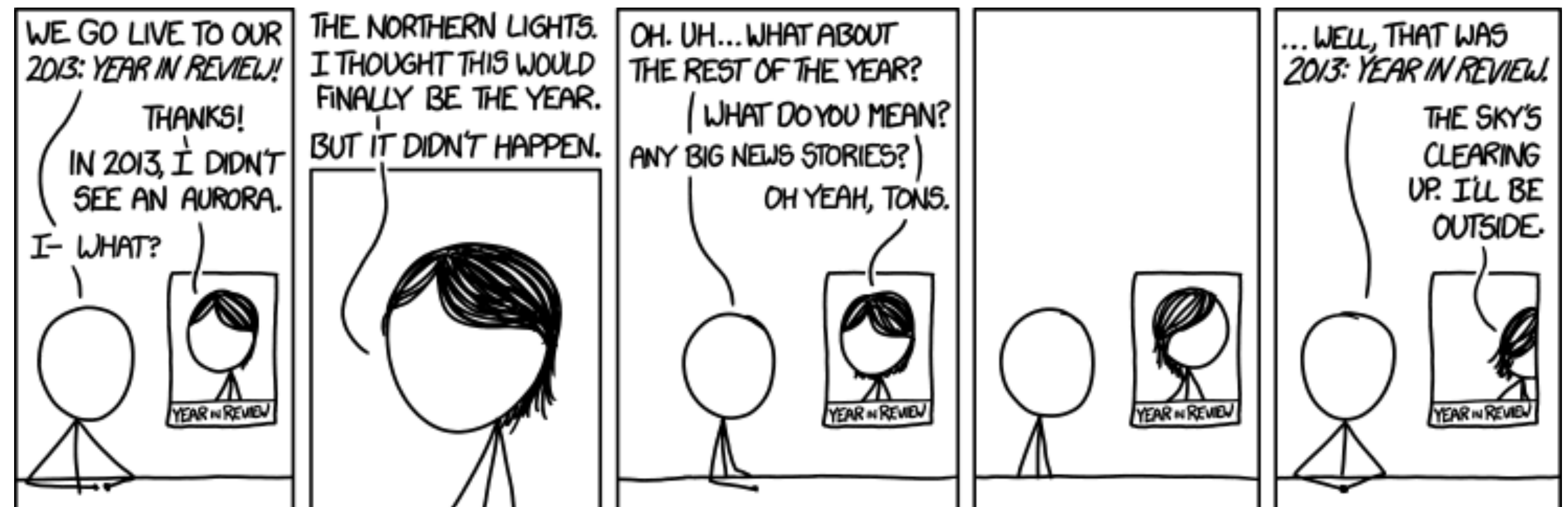


CS-5630 / CS-6630 Visualization

Best Projects, Review

Alexander Lex
alex@sci.utah.edu



Best Projects

The Process

Each TA nominates 4-5 of their projects

All staff meets, watch all videos, play with all tools, and discuss which ones get a nomination

Top three:

Each staff member casts three votes among his favorite projects

The Results

A first place and two runners up!

120% of points

6 Honorable Mentions

110% of points

For all: listed in “Hall of Fame” on website

The Honorable Mentions

In no particular Order

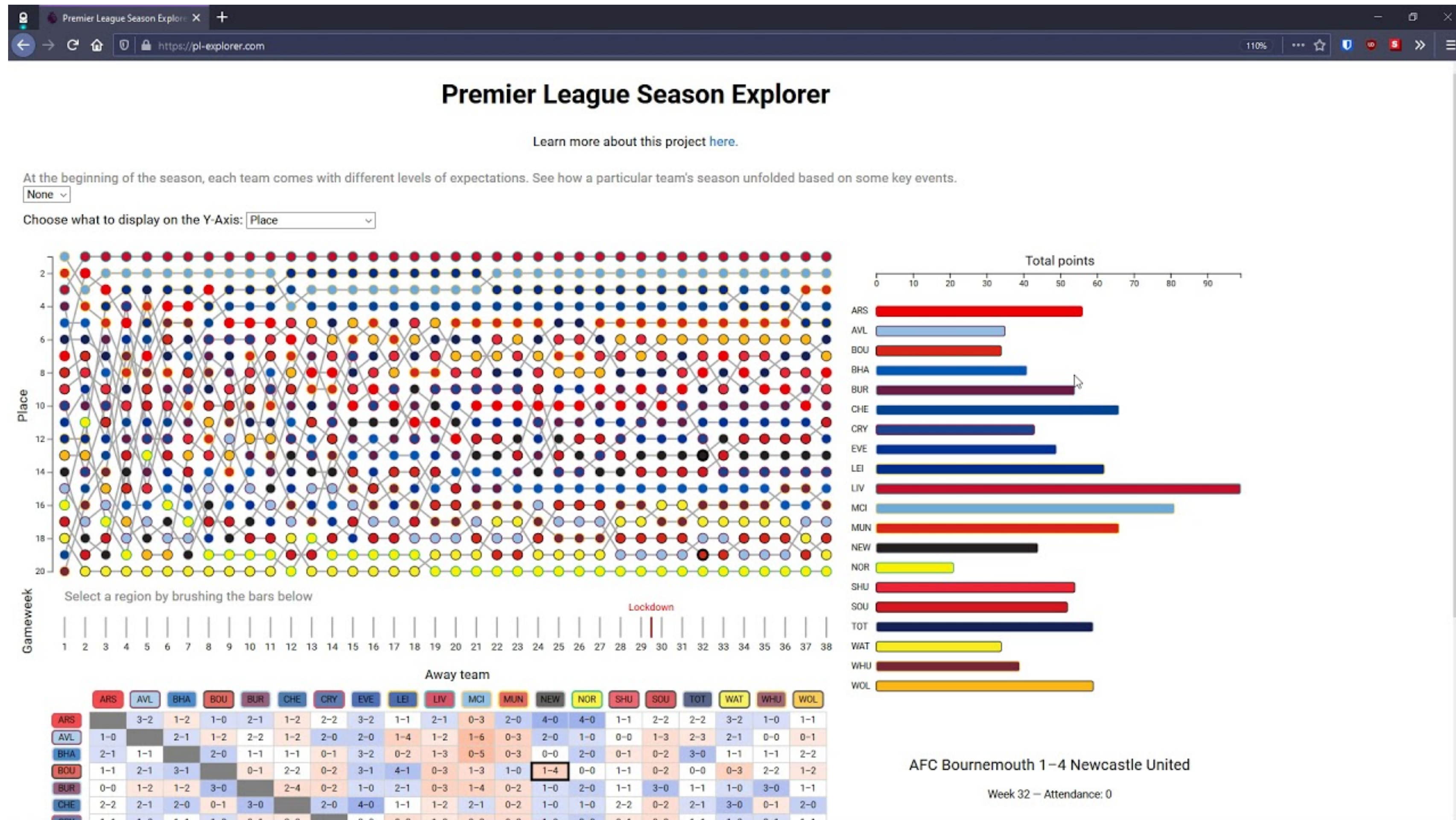
Clinical profiling in Colon cancer of Utah population

Seyoun Byun, Hyojoon Park



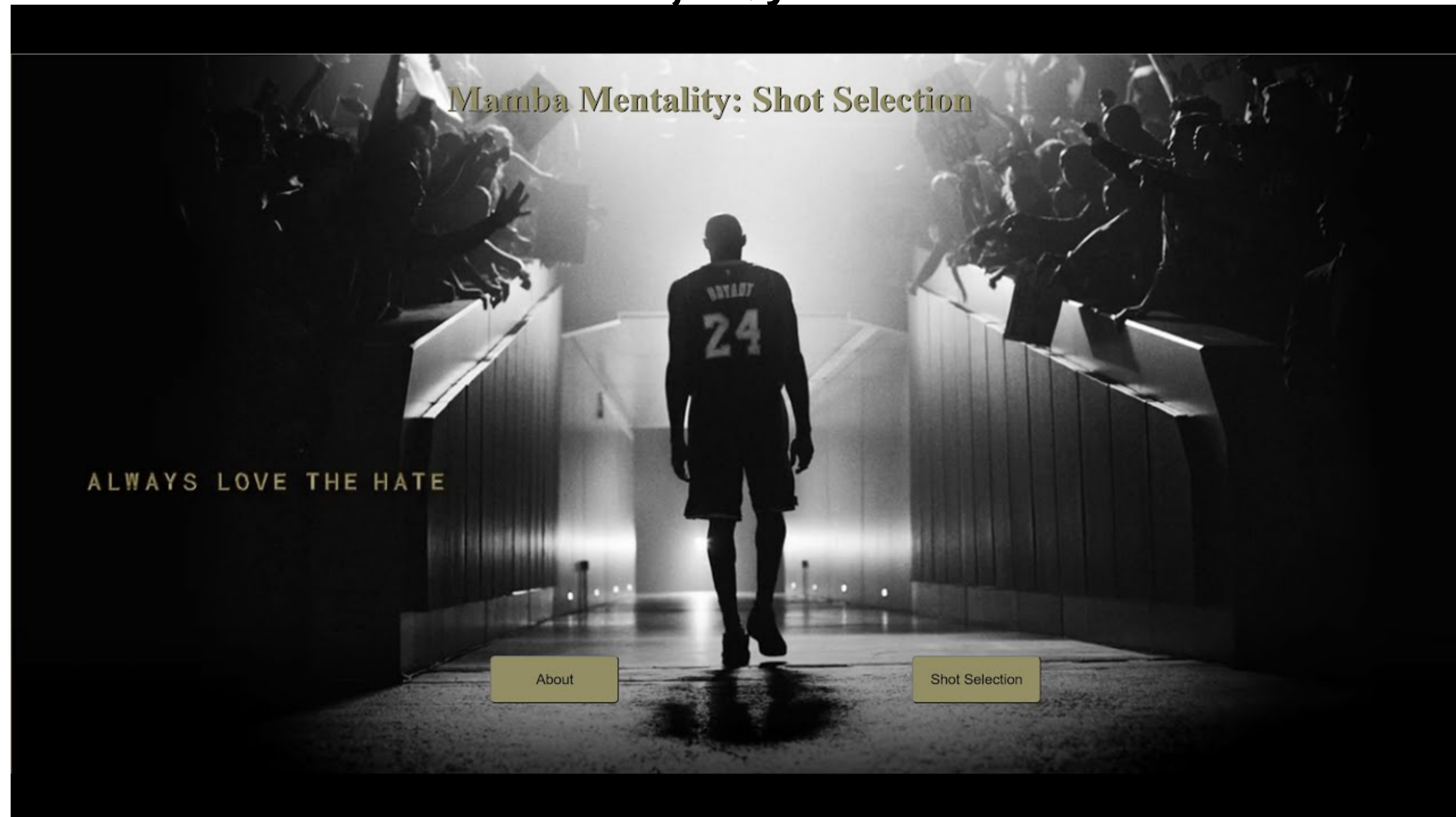
Premier League Season Explorer

Brian Eisner, Kevin Wood, Jakob Johnson



Mamba Mentality: Shot Selection

Marko Miholjic, Jordan Hendriksen



Avalanche Explorer

Joachim Meyer, Abishek Krishnan

<https://www.youtube.com/watch?v=2J-Xp8WJ9pQ>

Visualization of Metagenomic Data

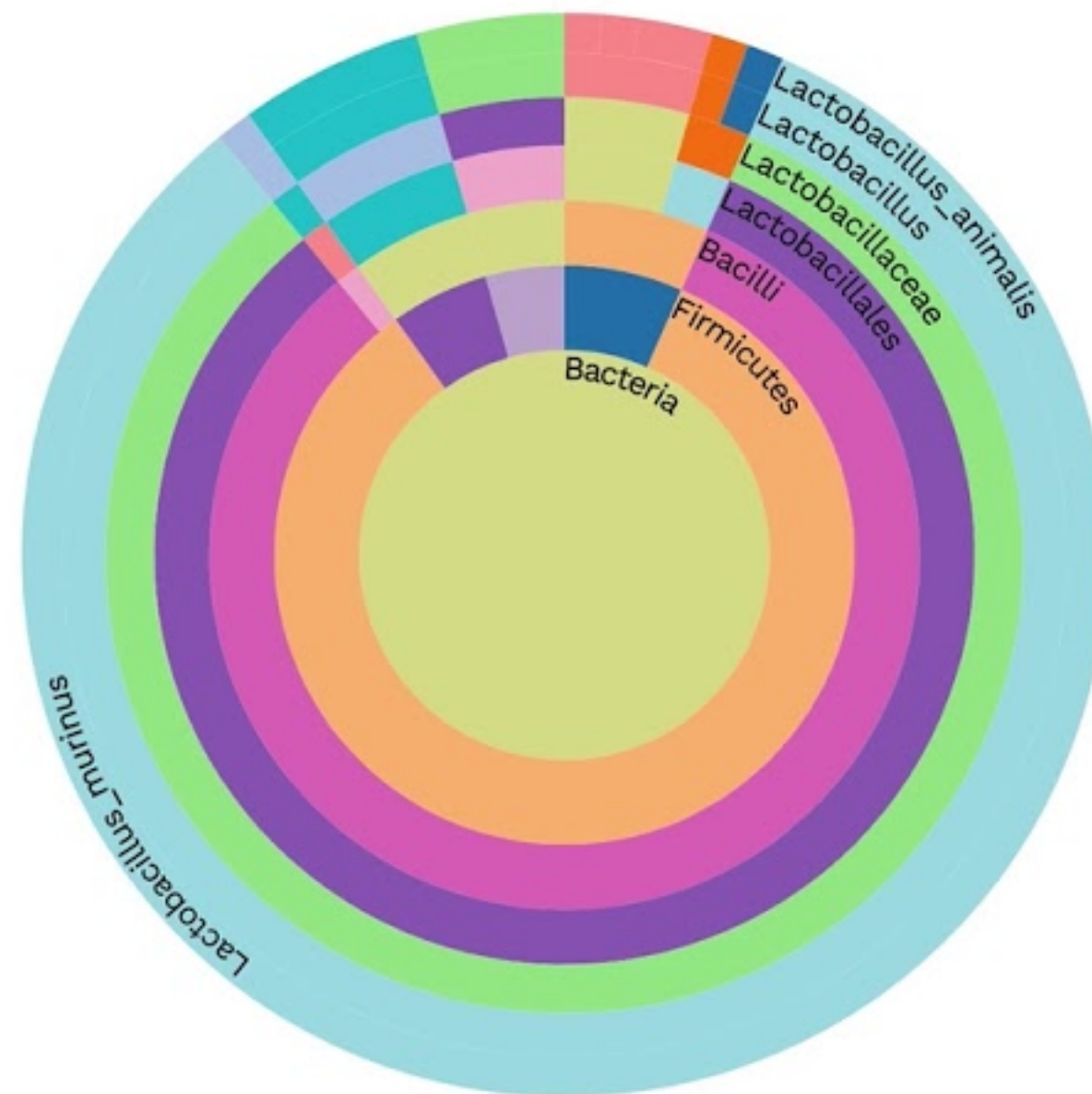
LeAnn Lindsey, Kimberly Truong, Lourdes Valdez

click on the species to remove in the legend.

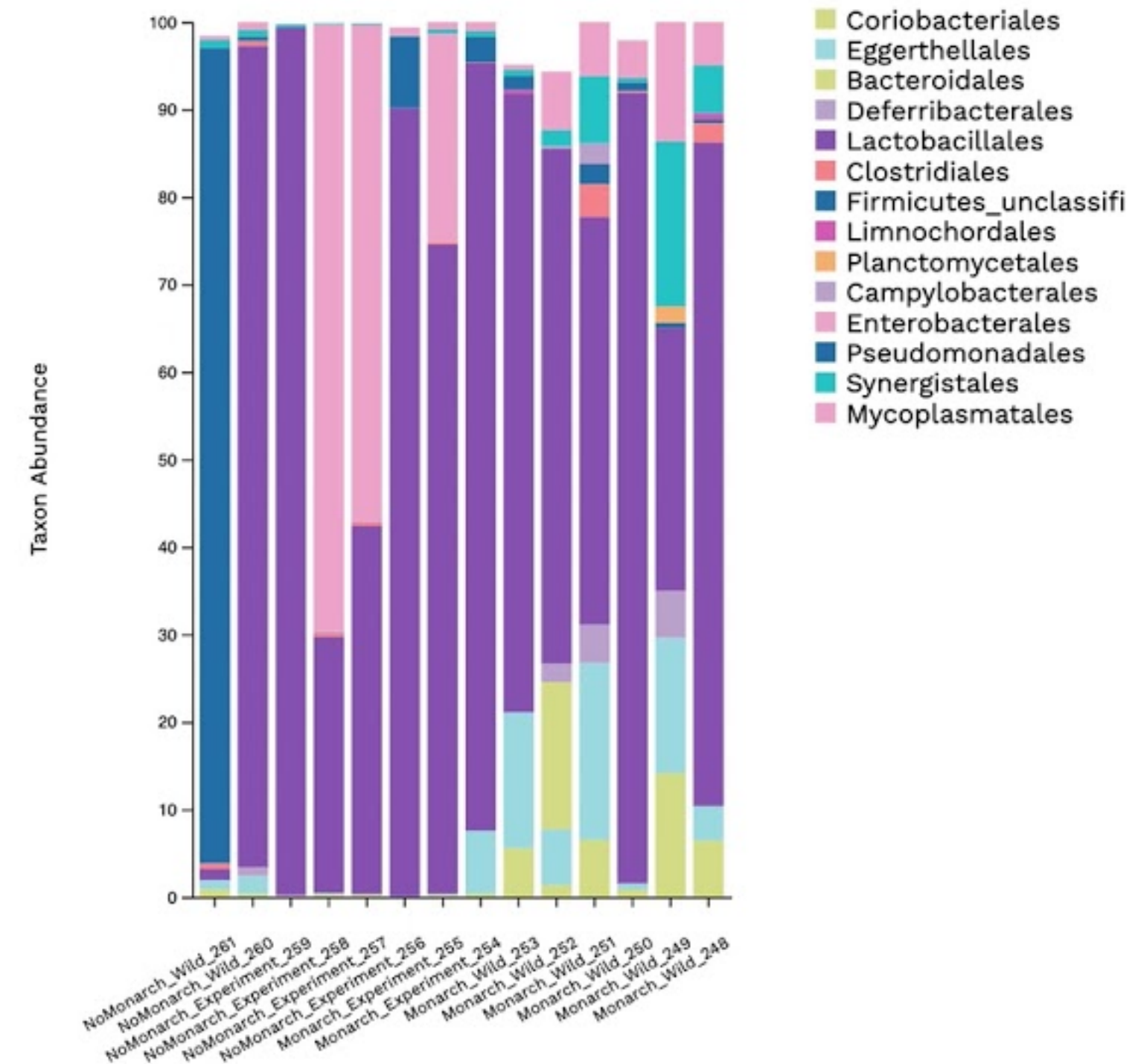
se View:

[View Phylogenetic Tree](#)
[View Sunburst Plot](#)

urst for Sample: Monarch_Wild_248



Level: Order



World Languages Datavis

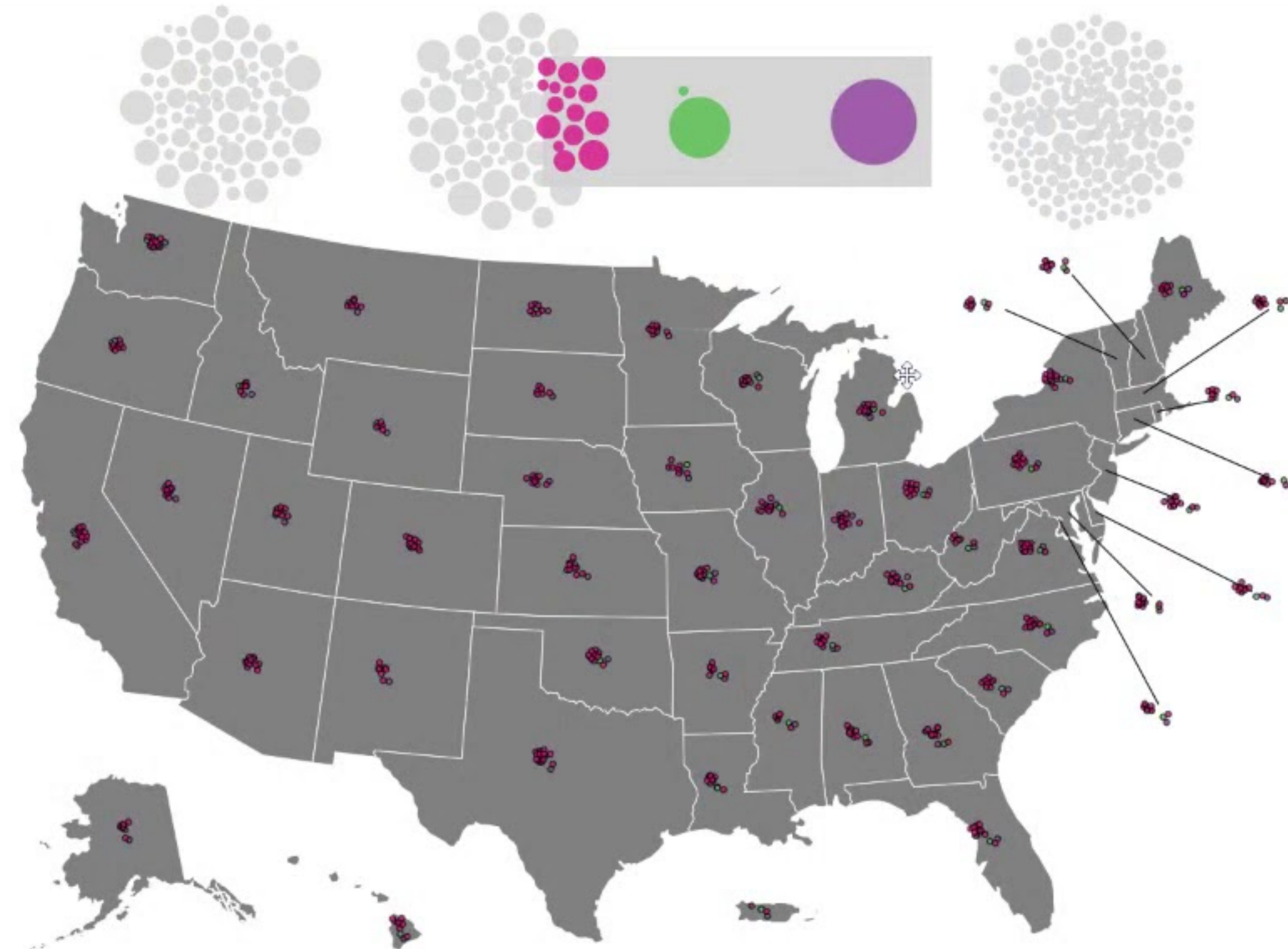
Andreas Martinson, Janaan Luke, Rachel Berghout

Where are these languages spoken in the U.S.?

English and Spanish are spoken in every single state, but what about the rest of these languages?

Click on the circles at the top to show the distribution of speakers across the United States or select multiple languages by clicking and dragging the brush across the languages you would like to see. Then hover over any bubble on the map to see how that language distribution compares to the other states.

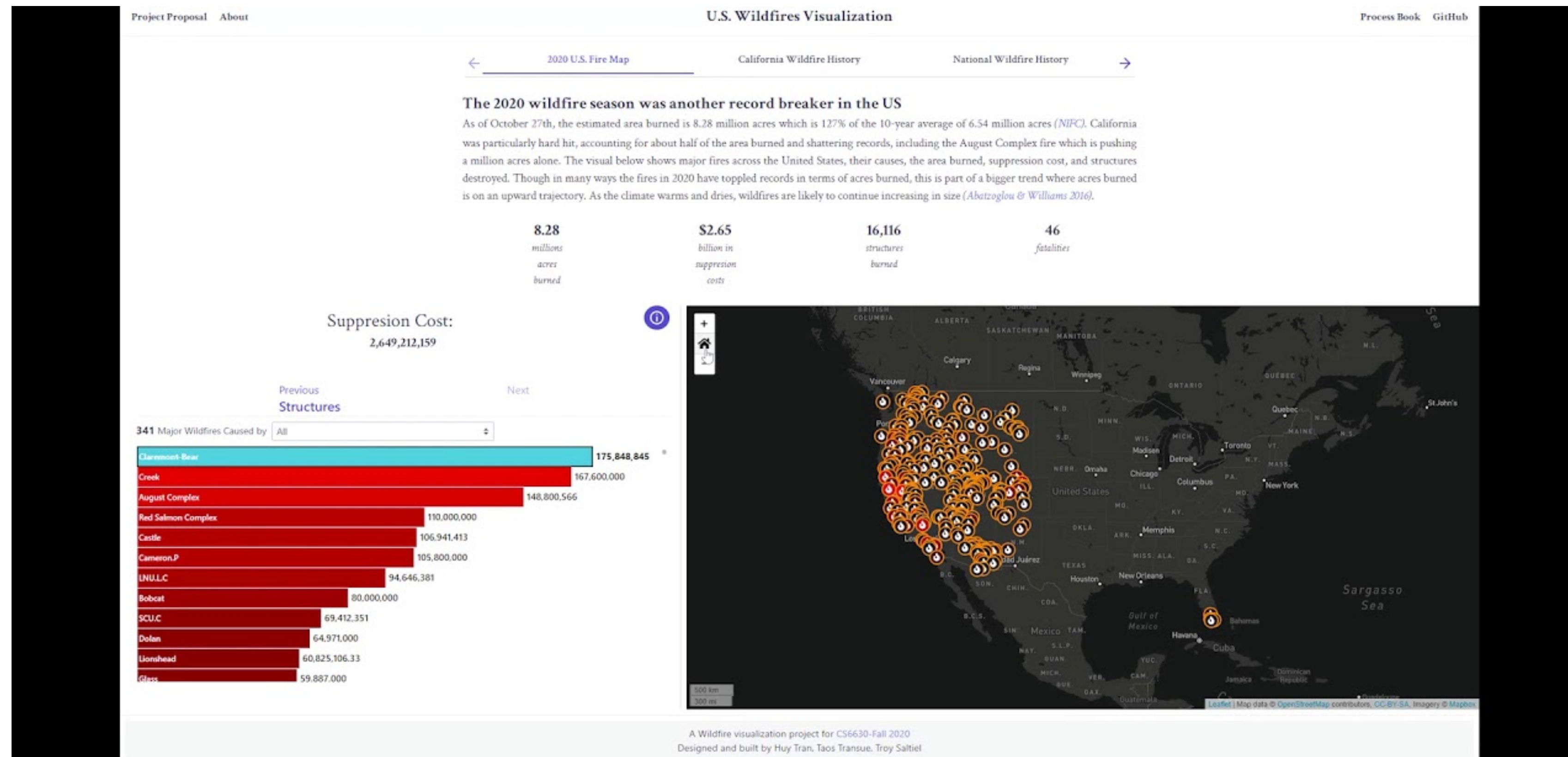
Aggregate Multiple Languages
Hover over the bubbles to compare languages in each states!



Runner Up

Visualizing US Fires 2020

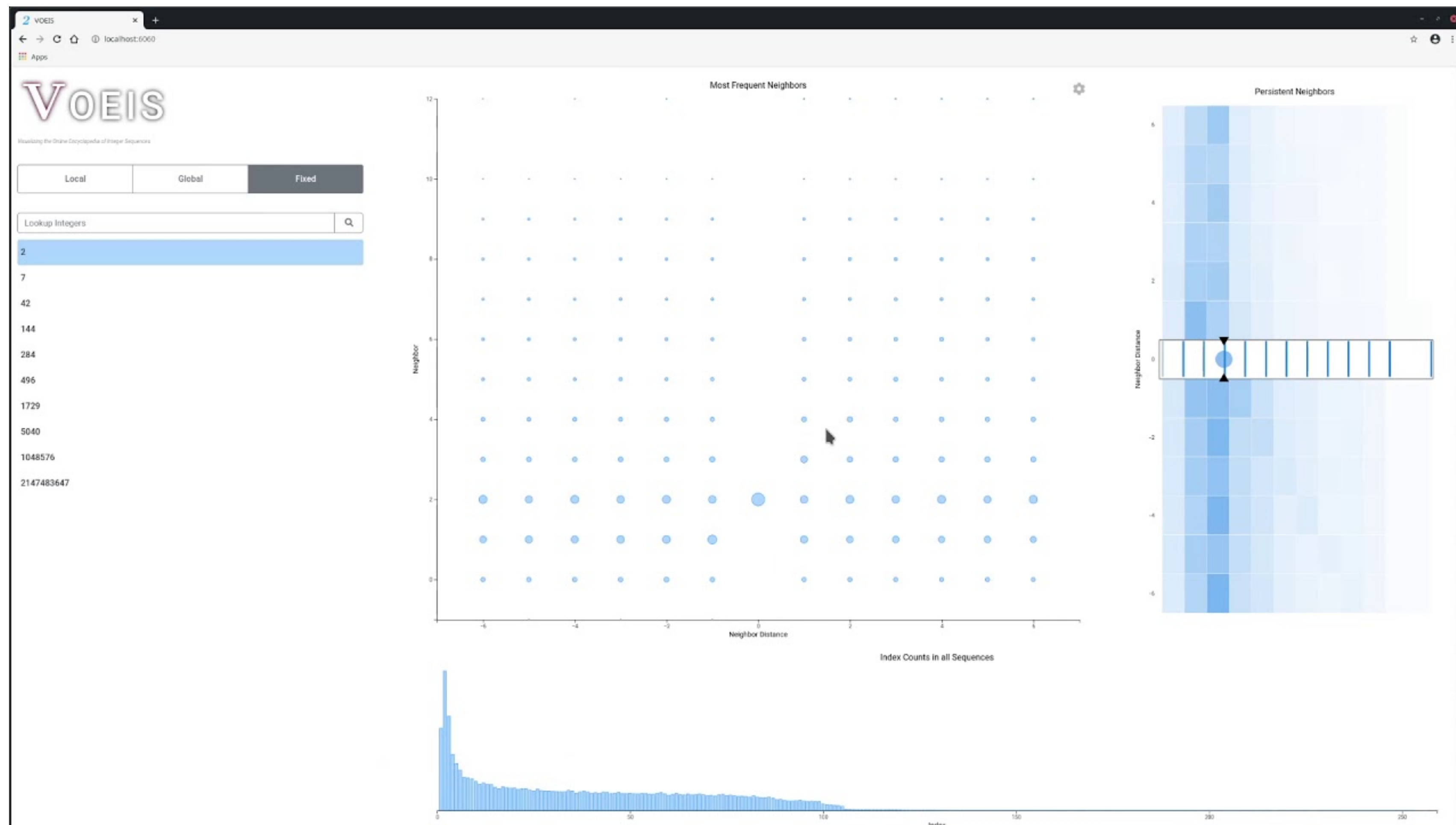
Taos Transue, Huy Tran, Troy Saltiel



Runner Up

VOEIS (Visualization of the Online Encyclopedia of Integer Sequences)

David Miller, Qianlang Chen, Jiawen Song



#1

Poké-Data

Sunny Siu, Kaelin Hoang

The screenshot shows the PokeData website interface. At the top, there's a red header with the "PokeData" logo. Below the header, there's a navigation bar with "Choose Generation: All Generations", "Process Book", and "Demo Video". A legend indicates "★ = Legendary Pokemon".

The main content area is divided into several sections:

- Welcome to PokeData!**: A introductory text explaining the site's purpose.
- Pidgey #16**: A detailed view of Pidgey, including its image, types (Normal and Flying), height (0.3 m), weight (1.8 kg), and an evolution chart.
- Stats Distribution**: A chart showing the distribution of Pidgey's stats (ATK, DEF, SPD, HP, SP ATK, SP DEF) across different levels.
- Search and Filter**: A search bar and a "Filters" dropdown menu.
- Pokemon List**: A table listing various Pokemon with their stats and types.

#	Name	Type 1	Type 2	Attack	Defense	Speed	HP	Special Attack	Special Defense
15	Beedrill	BUG	POISON	█	█	█	█	█	█
16	Pidgey	NORMAL	FLYING	█	█	█	█	█	█
17	Pidgeotto	NORMAL	FLYING	█	█	█	█	█	█
18	Pidgeot	NORMAL	FLYING	█	█	█	█	█	█
19	Rattata	NORMAL	DARK	█	█	█	█	█	█
20	Raticate	NORMAL	DARK	█	█	█	█	█	█
21	Spearow	NORMAL	FLYING	█	█	█	█	█	█
22	Fearow	NORMAL	FLYING	█	█	█	█	█	█
23	Ekans	POISON	-	█	█	█	█	█	█
24	Arbok	POISON	-	█	█	█	█	█	█
25	Pikachu	ELECTRIC	-	█	█	█	█	█	█
26	Raichu	ELECTRIC	ELECTRIC	█	█	█	█	█	█
27	Sandshrew	GROUND	ICE	█	█	█	█	█	█
28	Sandslash	GROUND	ICE	█	█	█	█	█	█
29	Nidoran♀	POISON	-	█	█	█	█	█	█
30	Nidorina	POISON	-	█	█	█	█	█	█
31	Nidoqueen	POISON	GROUND	█	█	█	█	█	█

Recap

Course Components

Lecture
Reading
Discussion

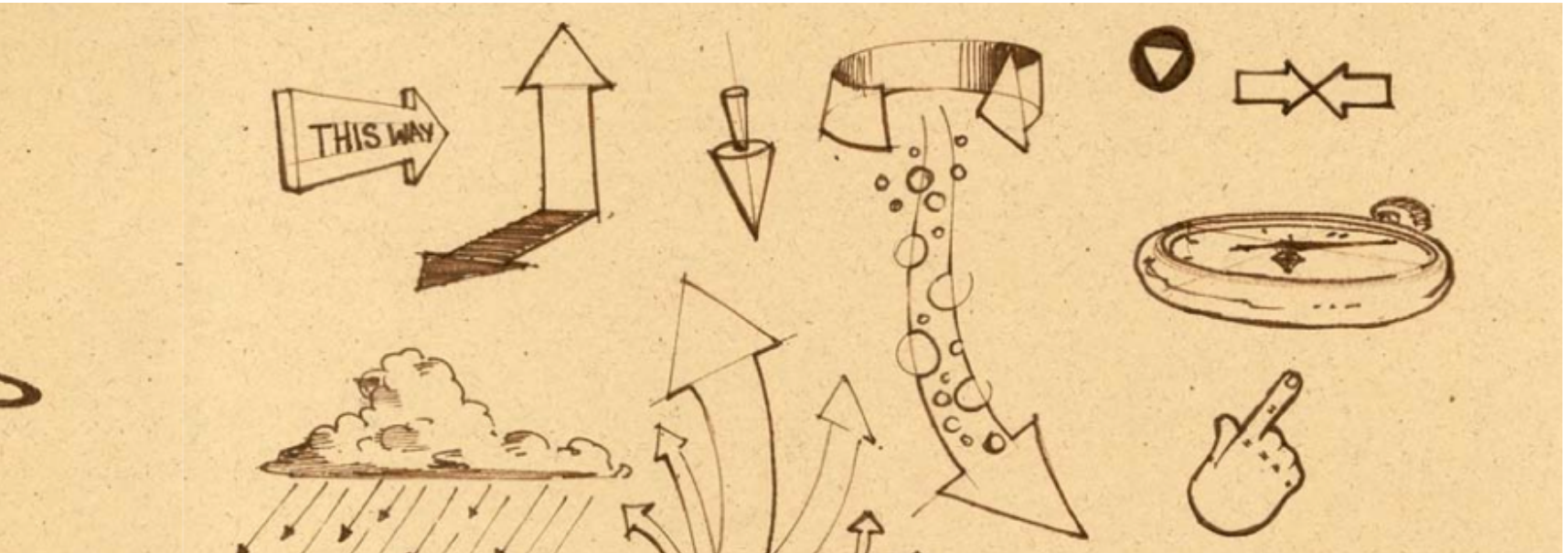
Theory

Design Lectures
Design Critiques
Exercises

Labs
D3 reading
Self-study
Office hours

Design Skills

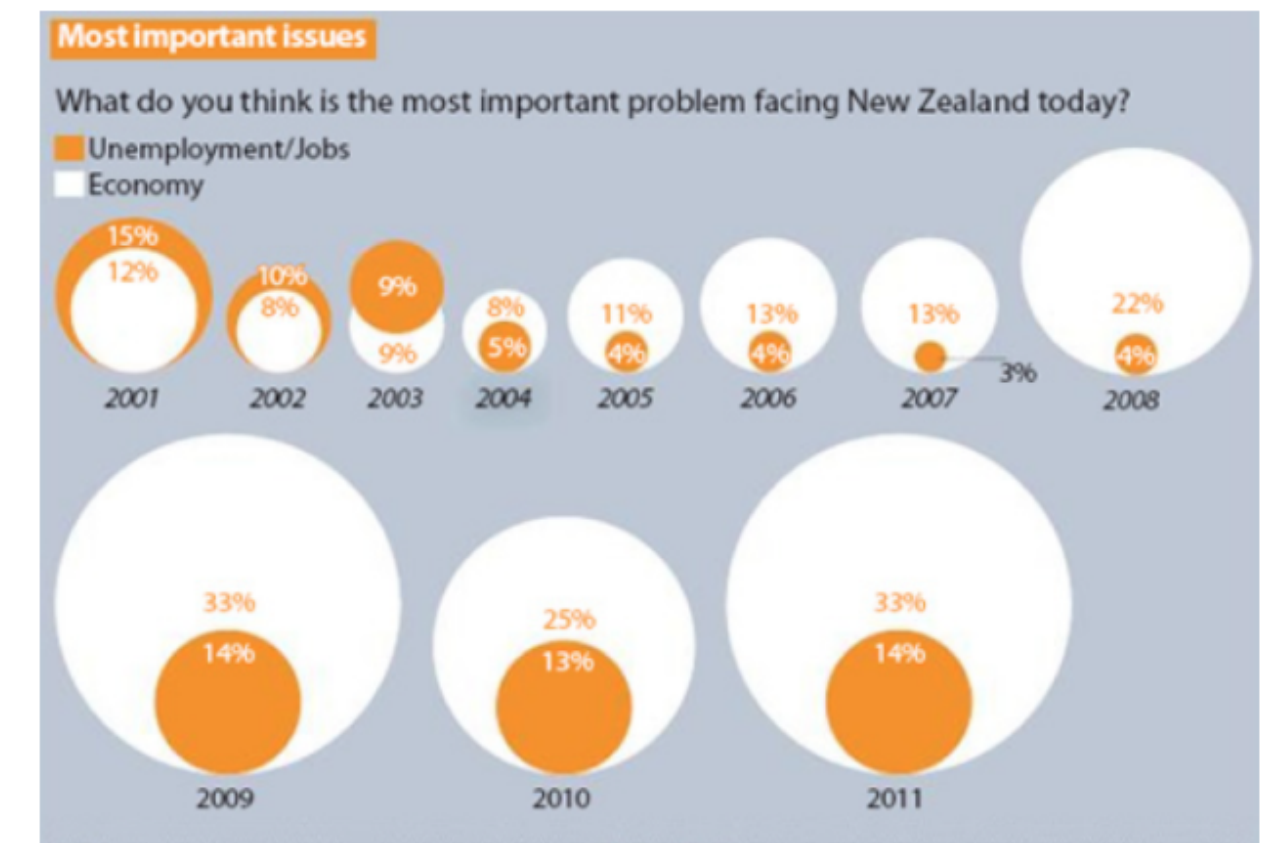
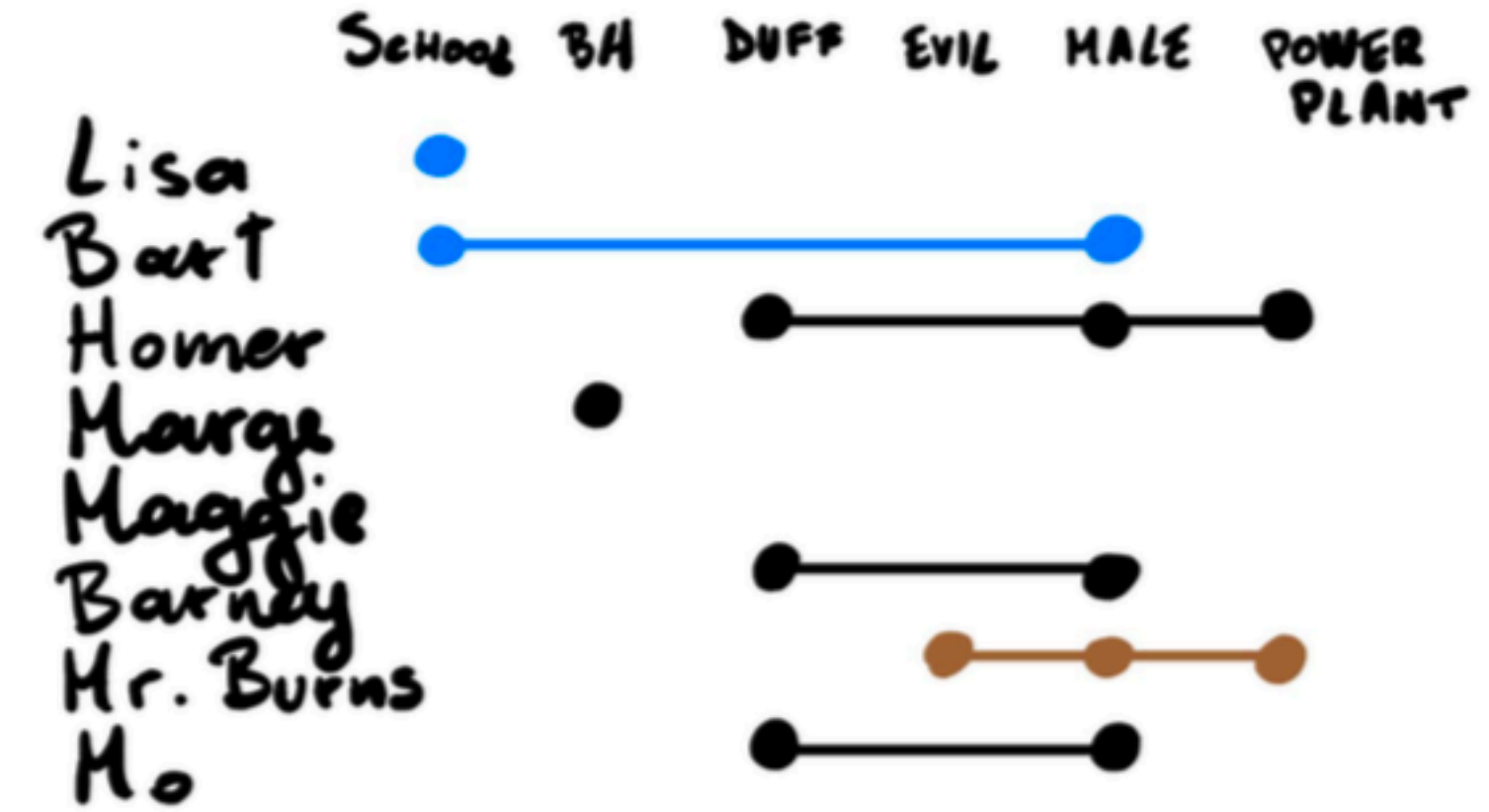
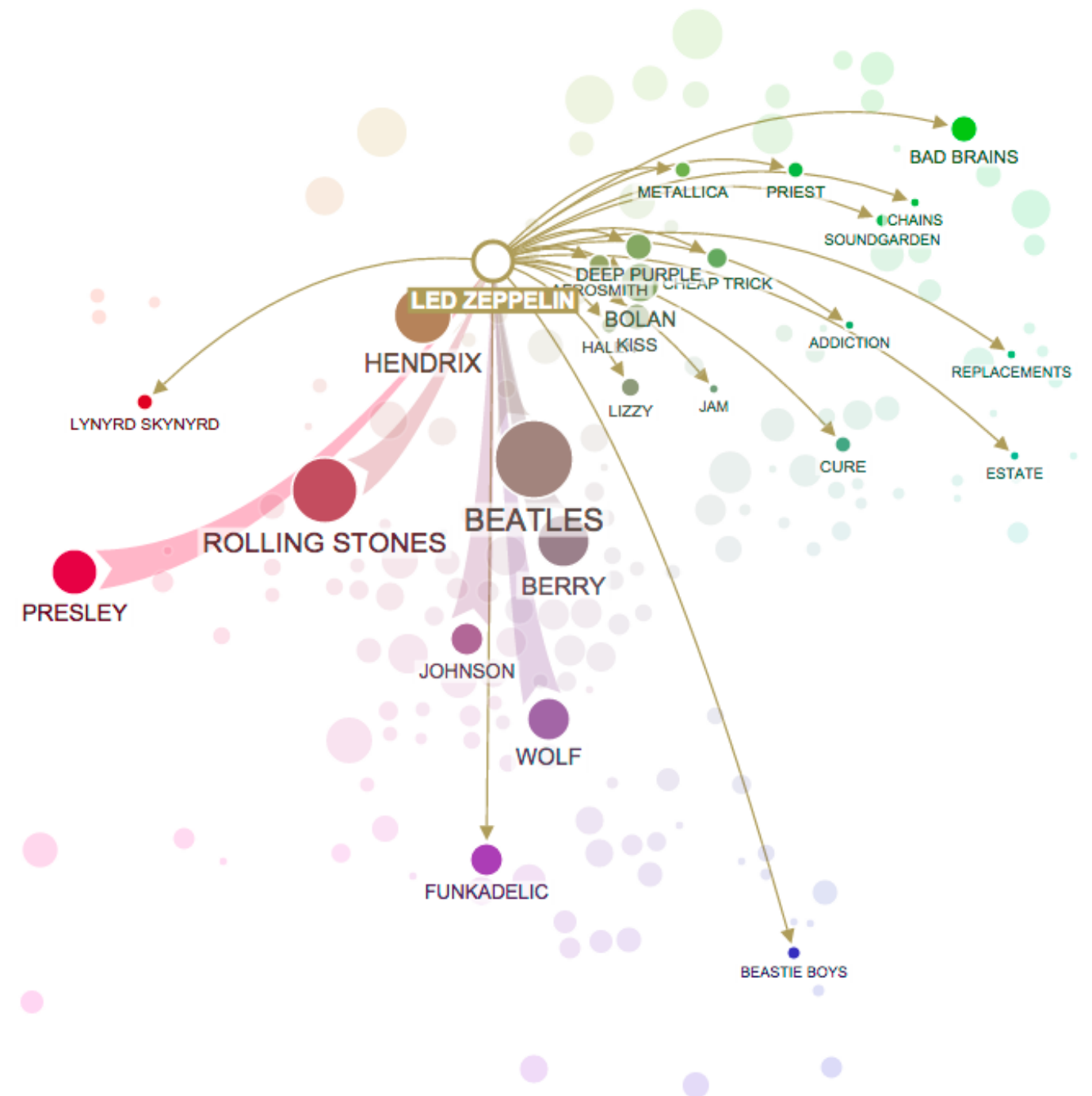
Coding Skills



```
<!DOCTYPE html>  
<meta charset="utf-8">  
<style>  
  
text {  
  font: 10px sans-serif;  
}  
  
</style>  
<body>  
<script src="http://d3js.org/d3.v3.min.js"></script>  
</script>
```

What is a good visualization?

Design Critiques and Redesigns



Programming

HTML



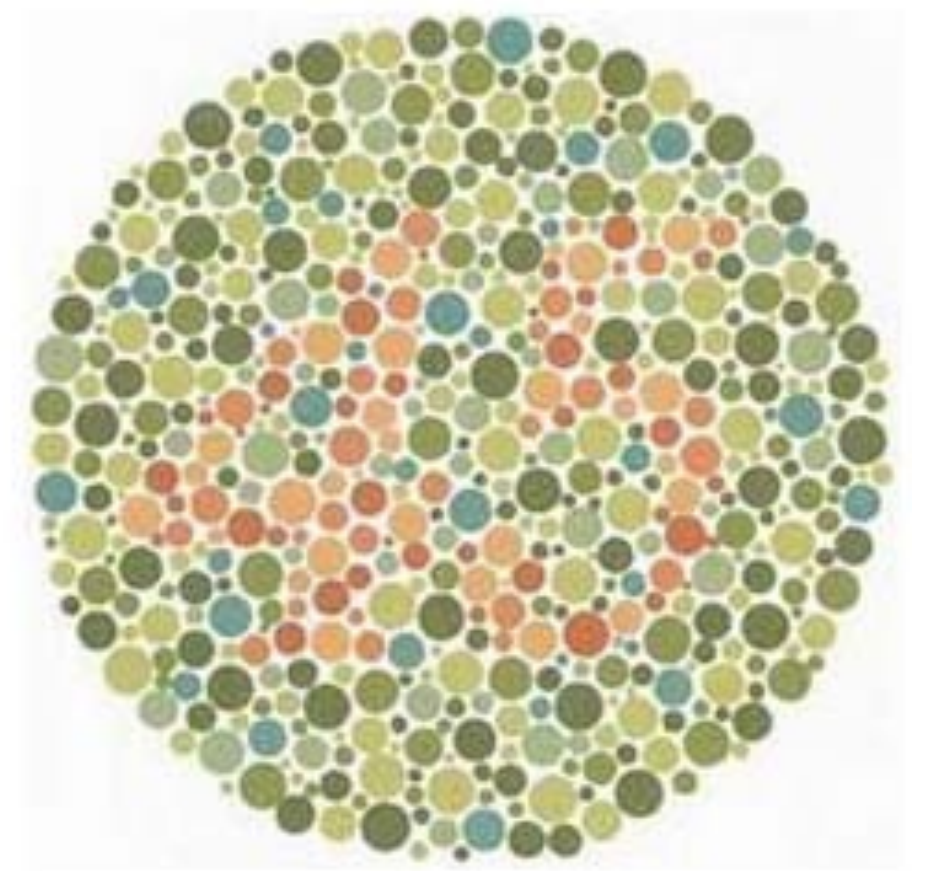
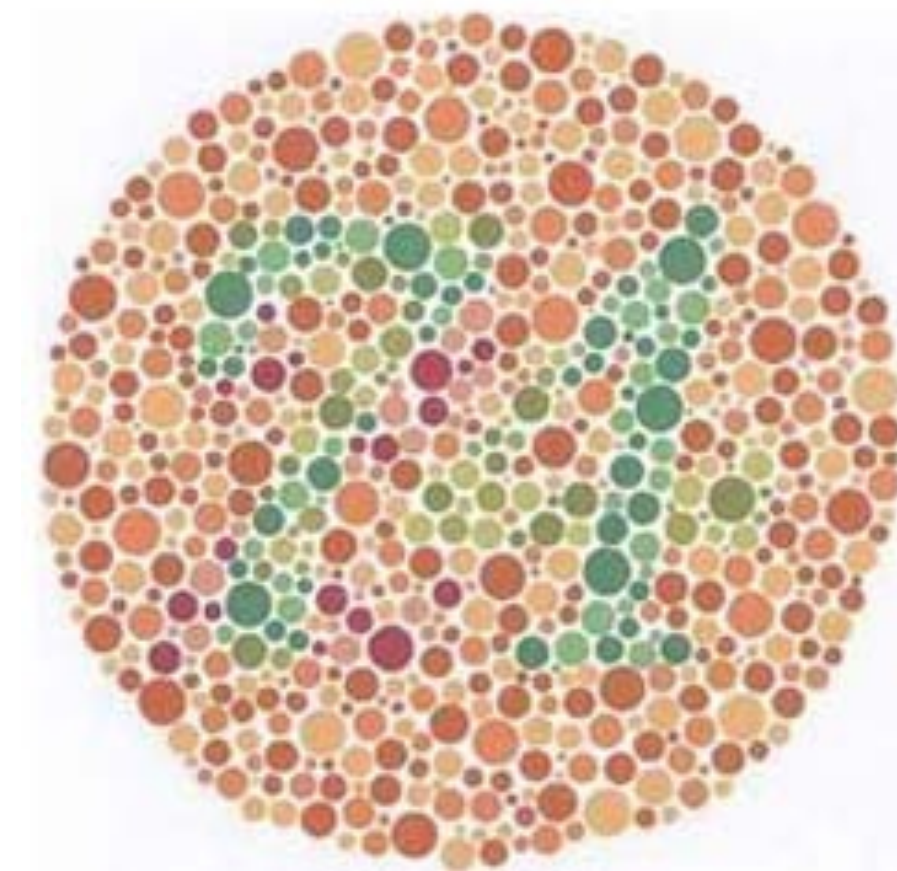
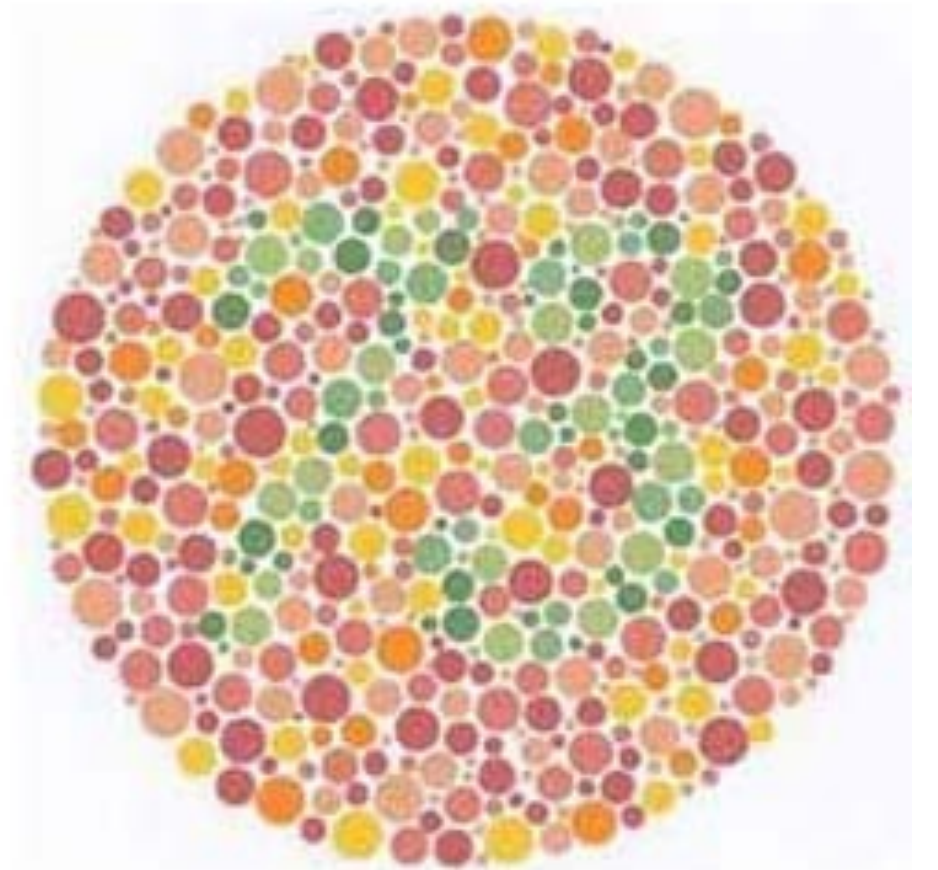
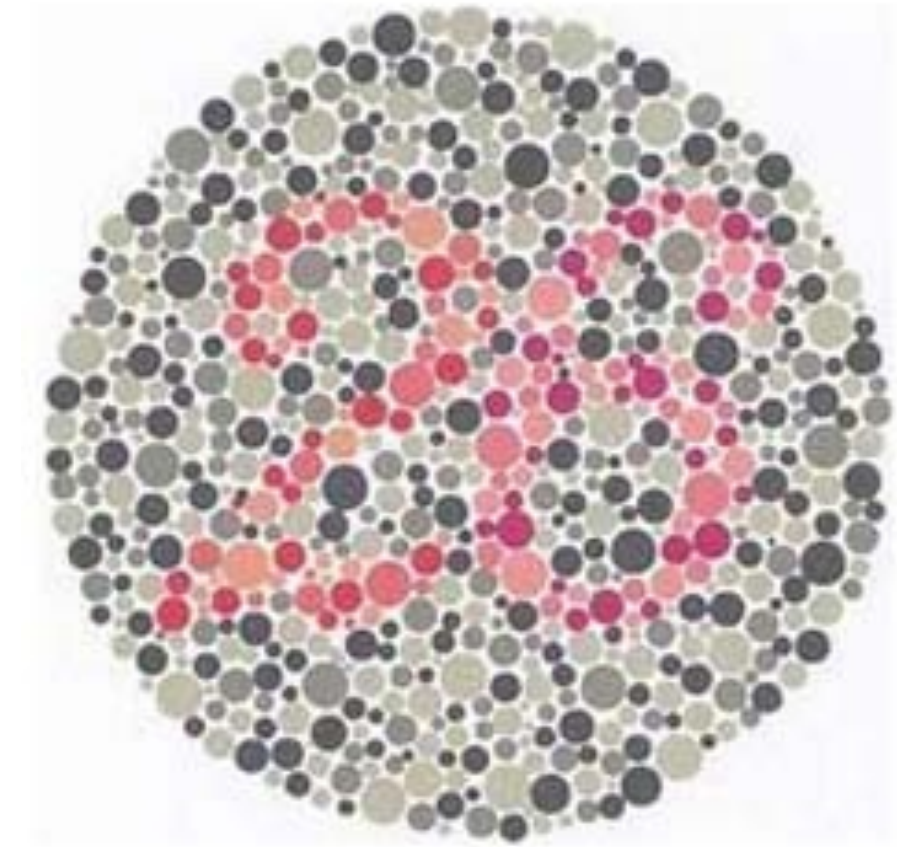
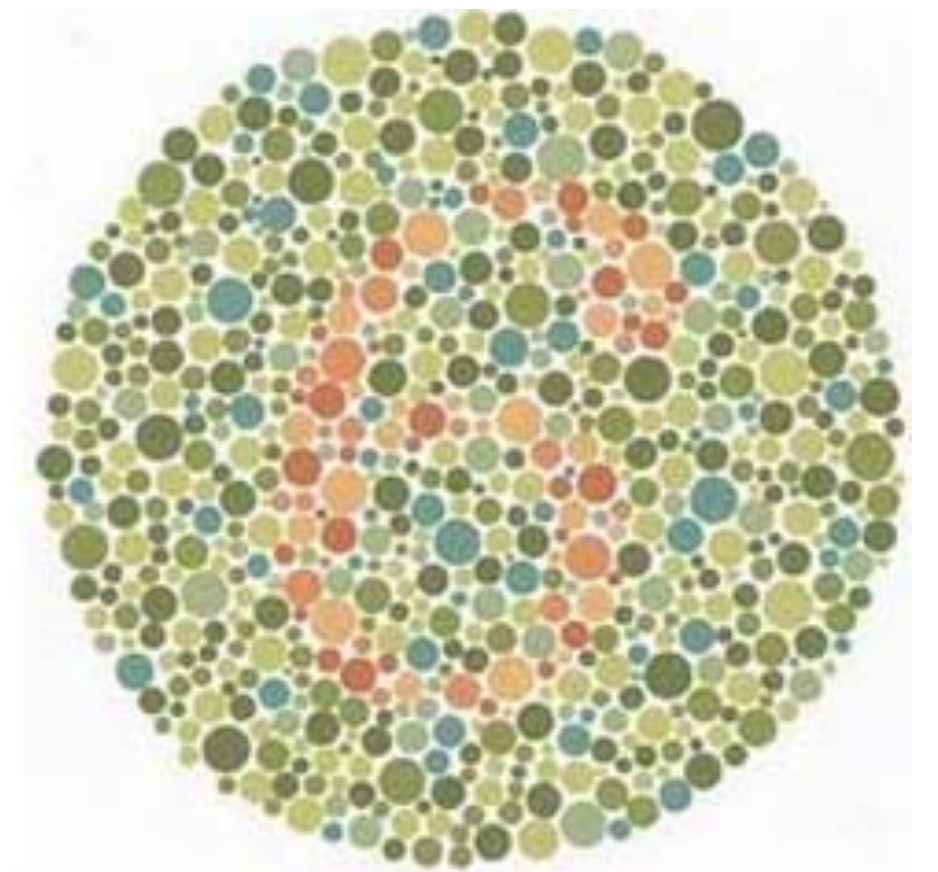
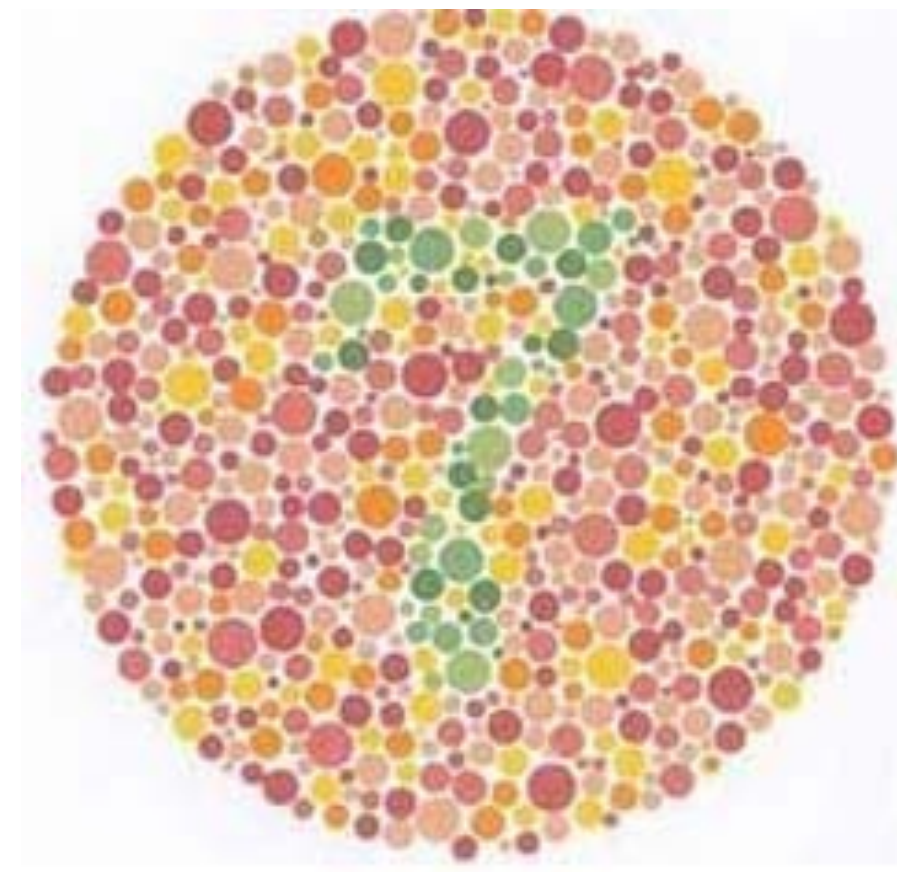
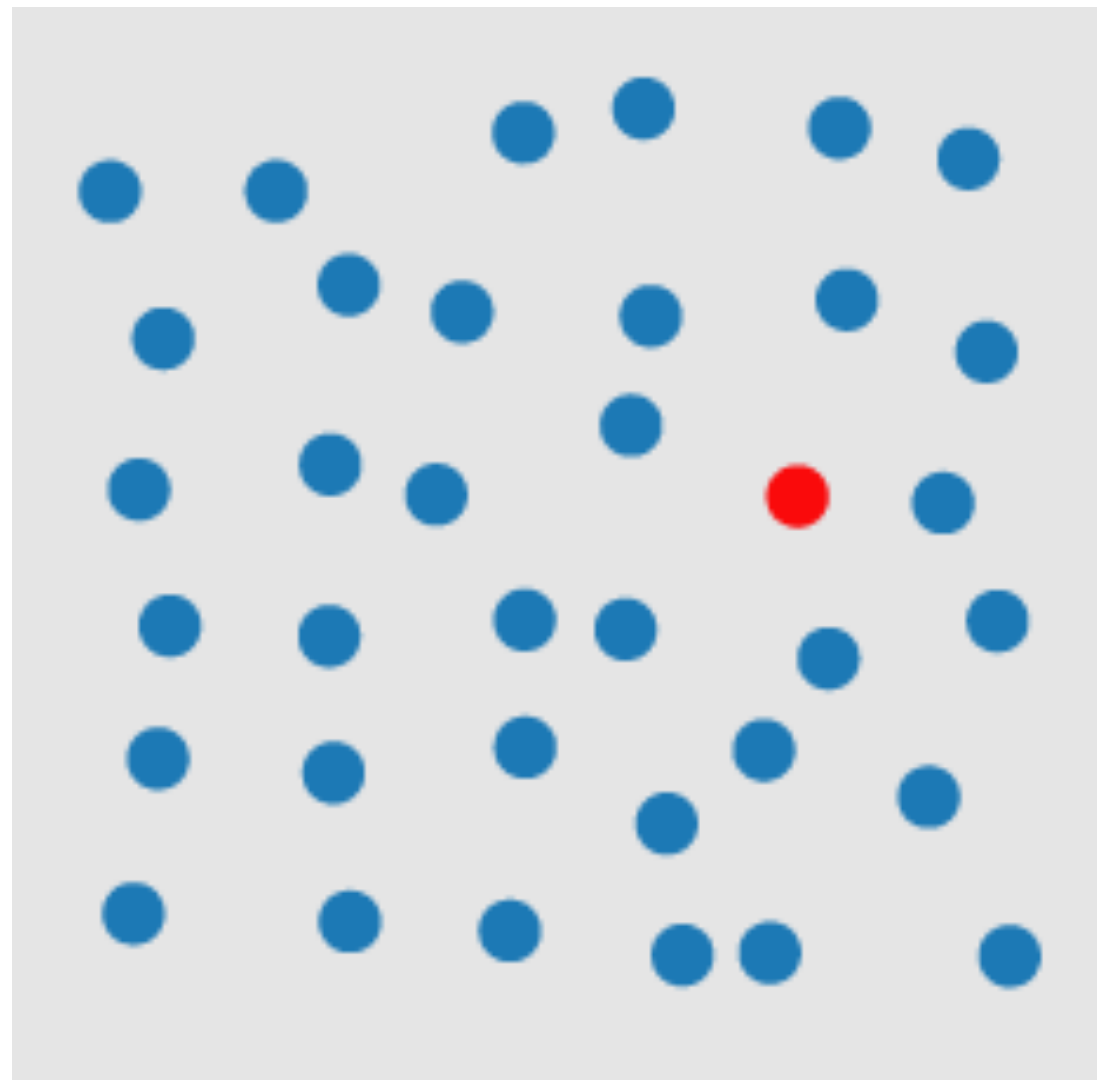
JS



Data-Driven Documents



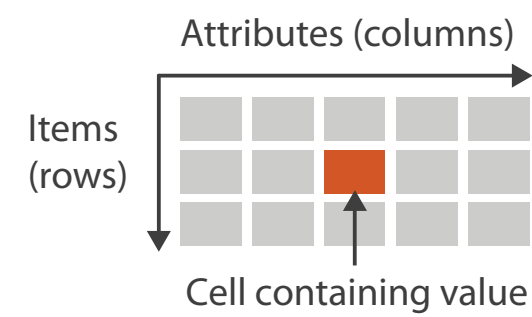
Perception



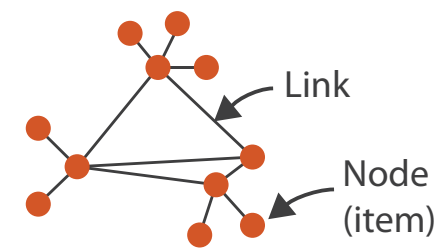
Data, Marks & Channels

Dataset Types

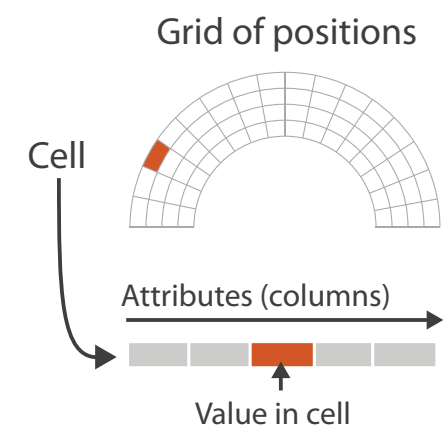
→ Tables



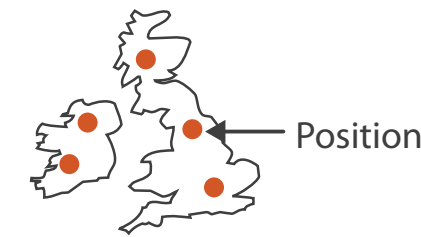
→ Networks



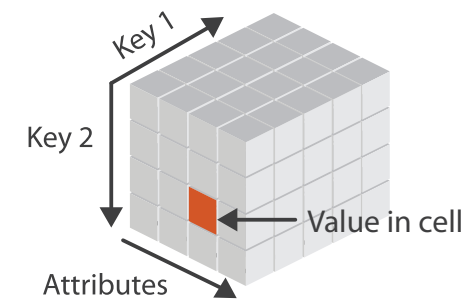
→ Fields (Continuous)



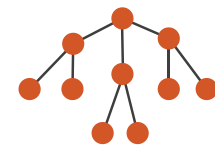
→ Geometry (Spatial)



→ Multidimensional Table

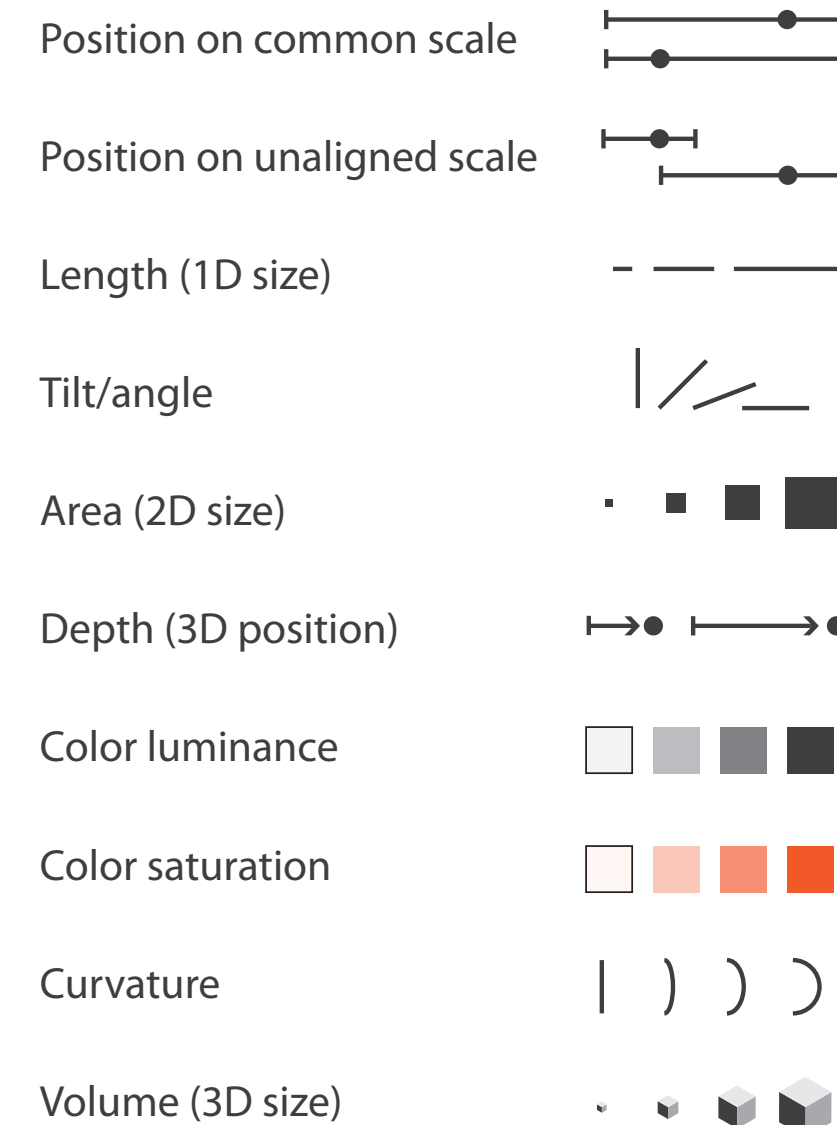


→ Trees



Channels: Expressiveness Types and Effectiveness Ranks

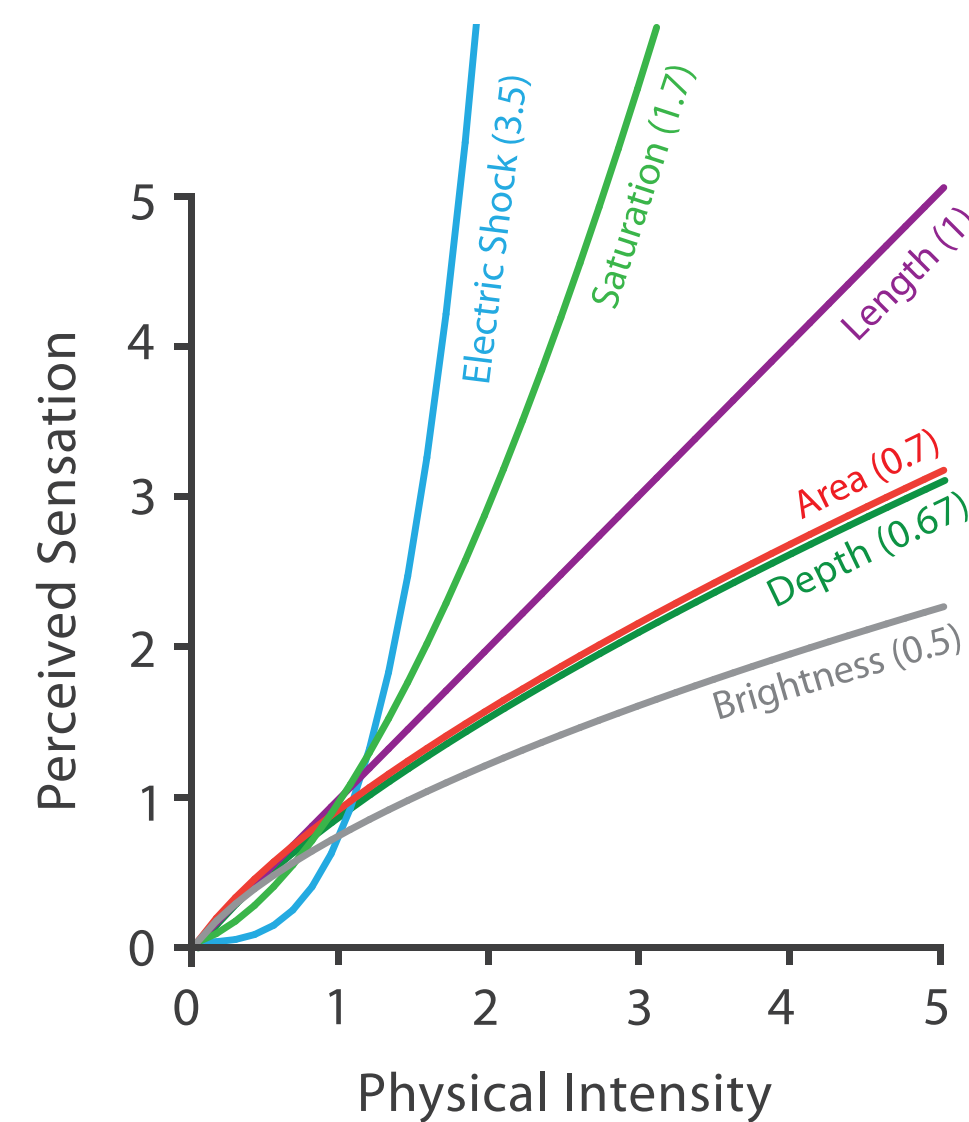
→ Magnitude Channels: Ordered Attributes



→ Identity Channels: Categorical Attributes

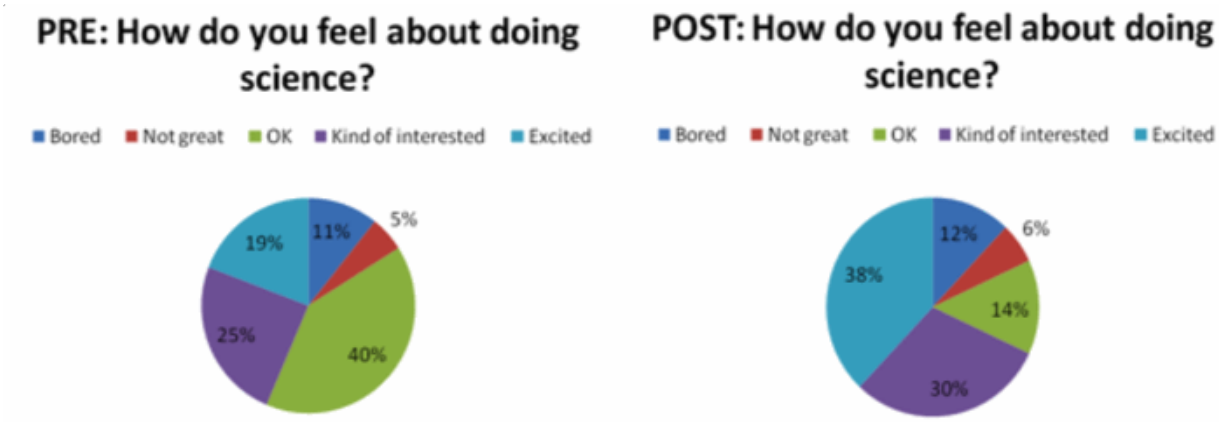
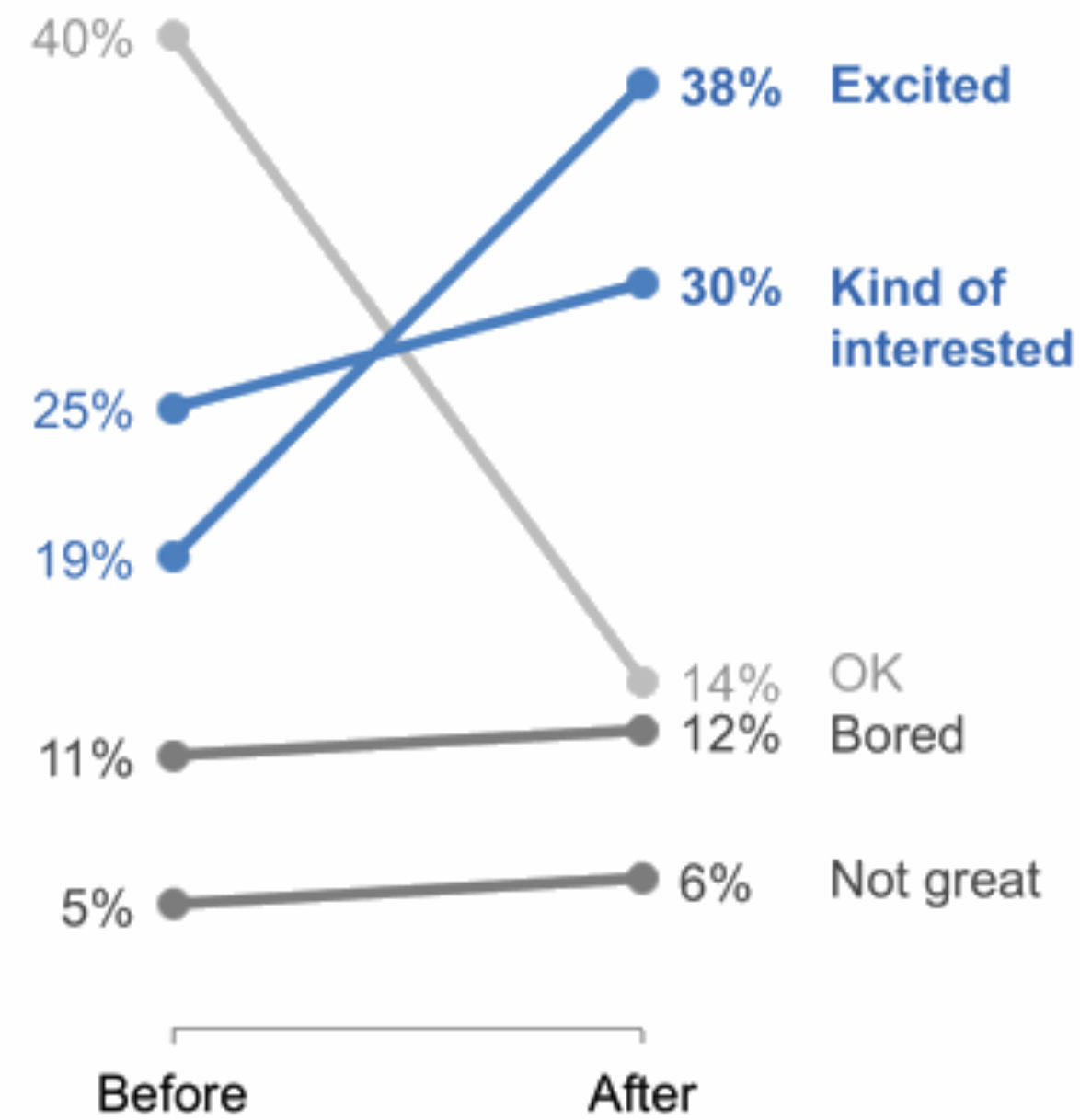


Steven's Psychophysical Power Law: $S = I^N$

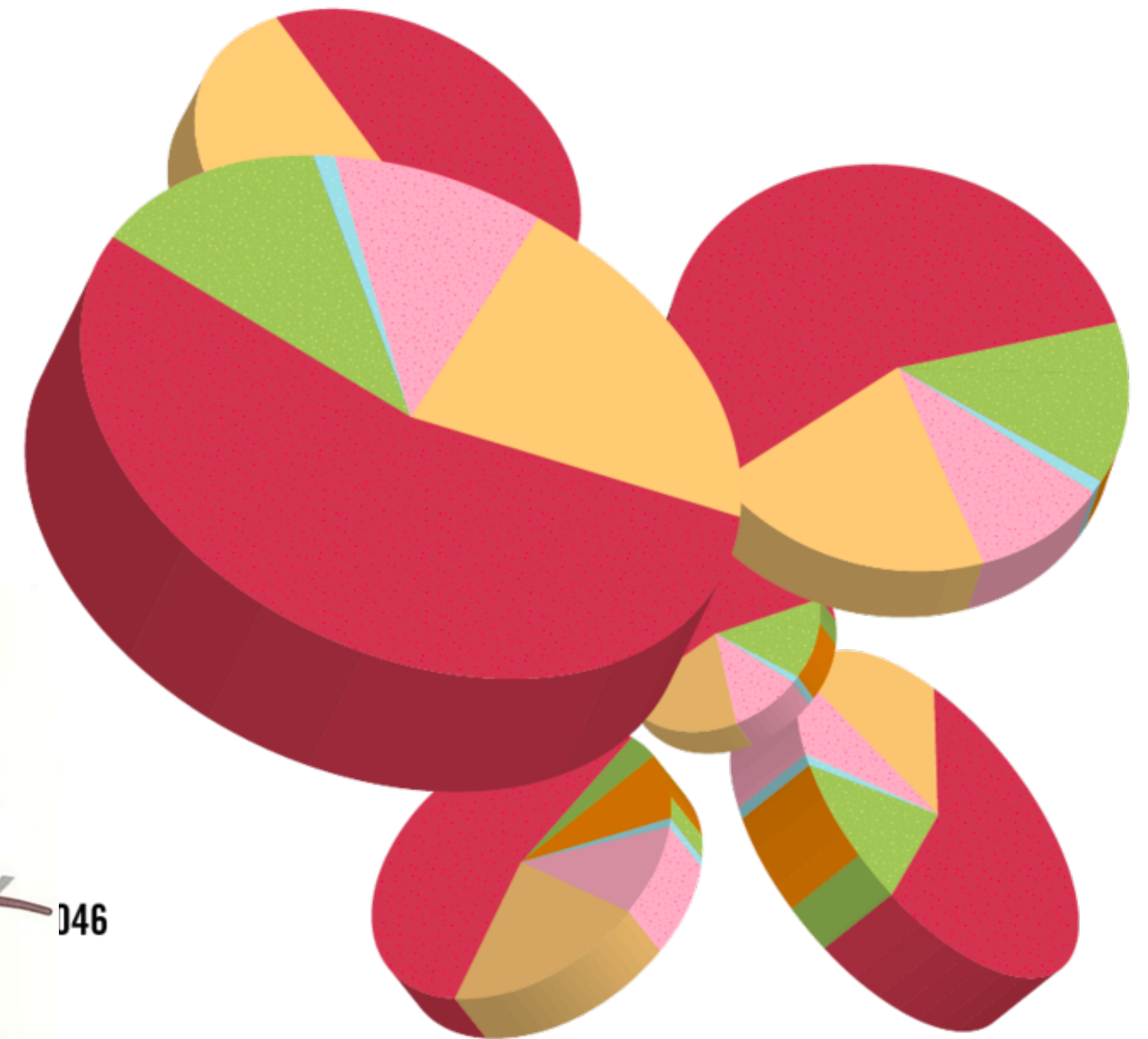


Design Guidelines

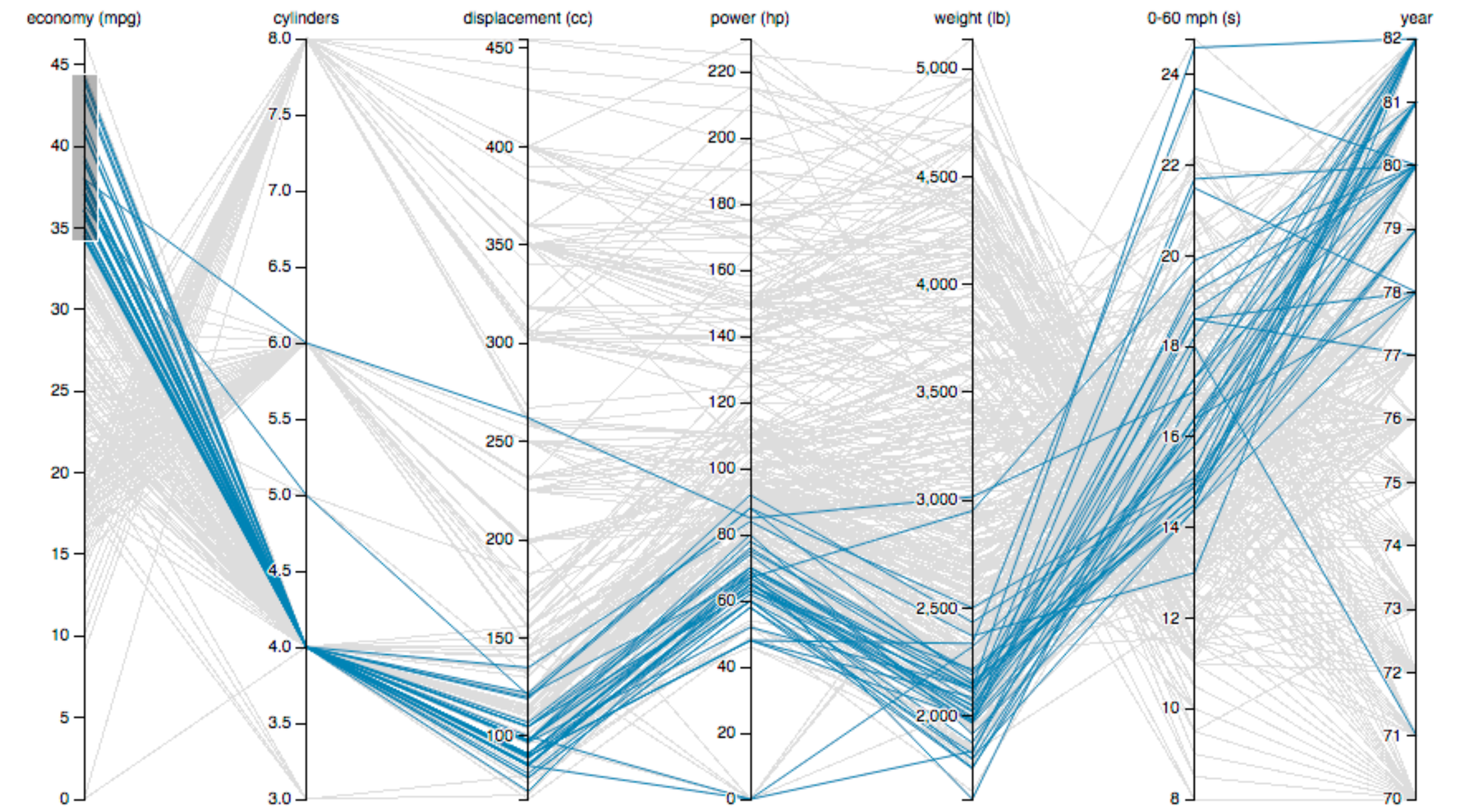
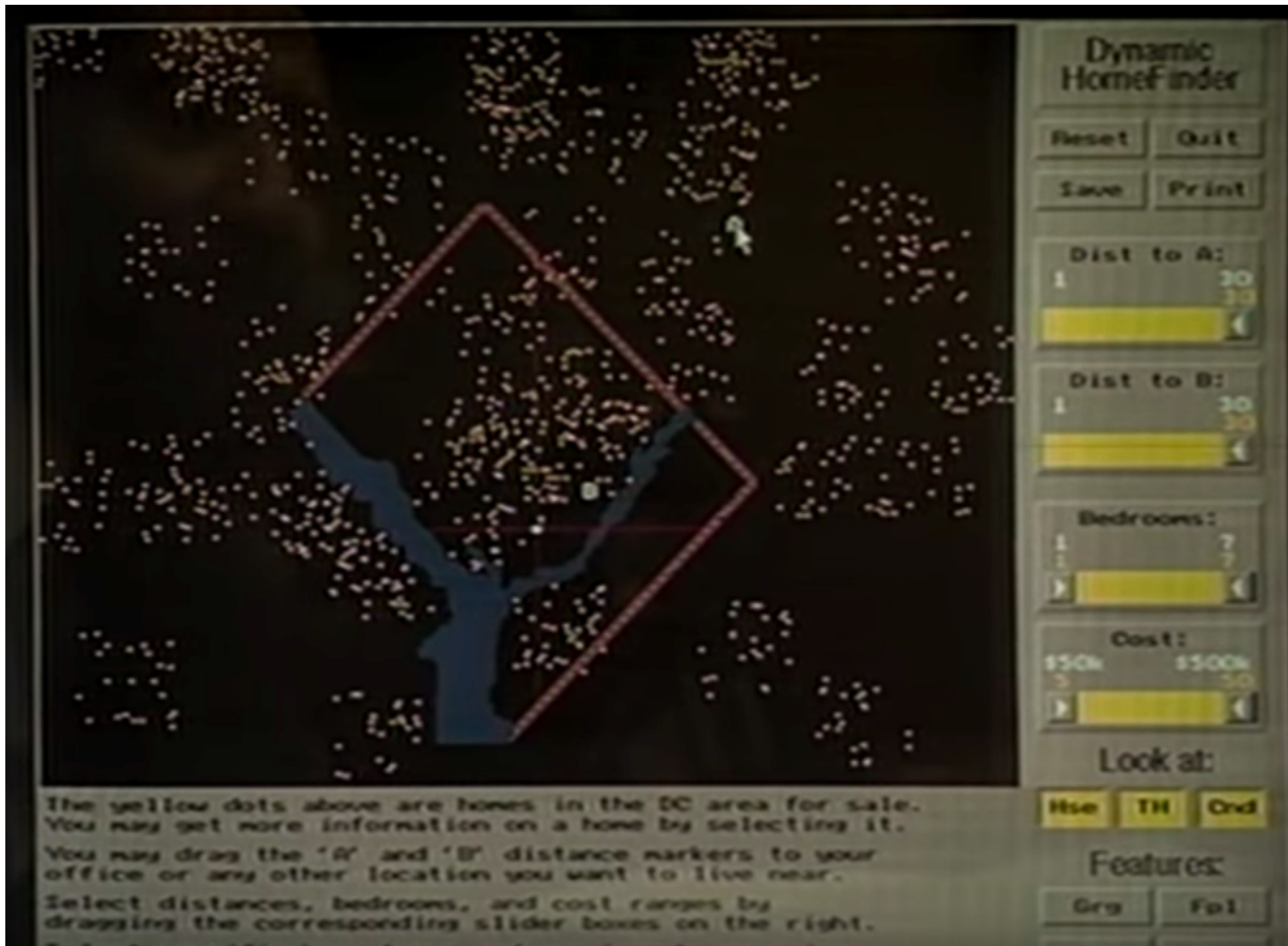
How do you feel about science?



Convictions in England and Wales for class A drug supply.



Interaction



Views

Multiple Views

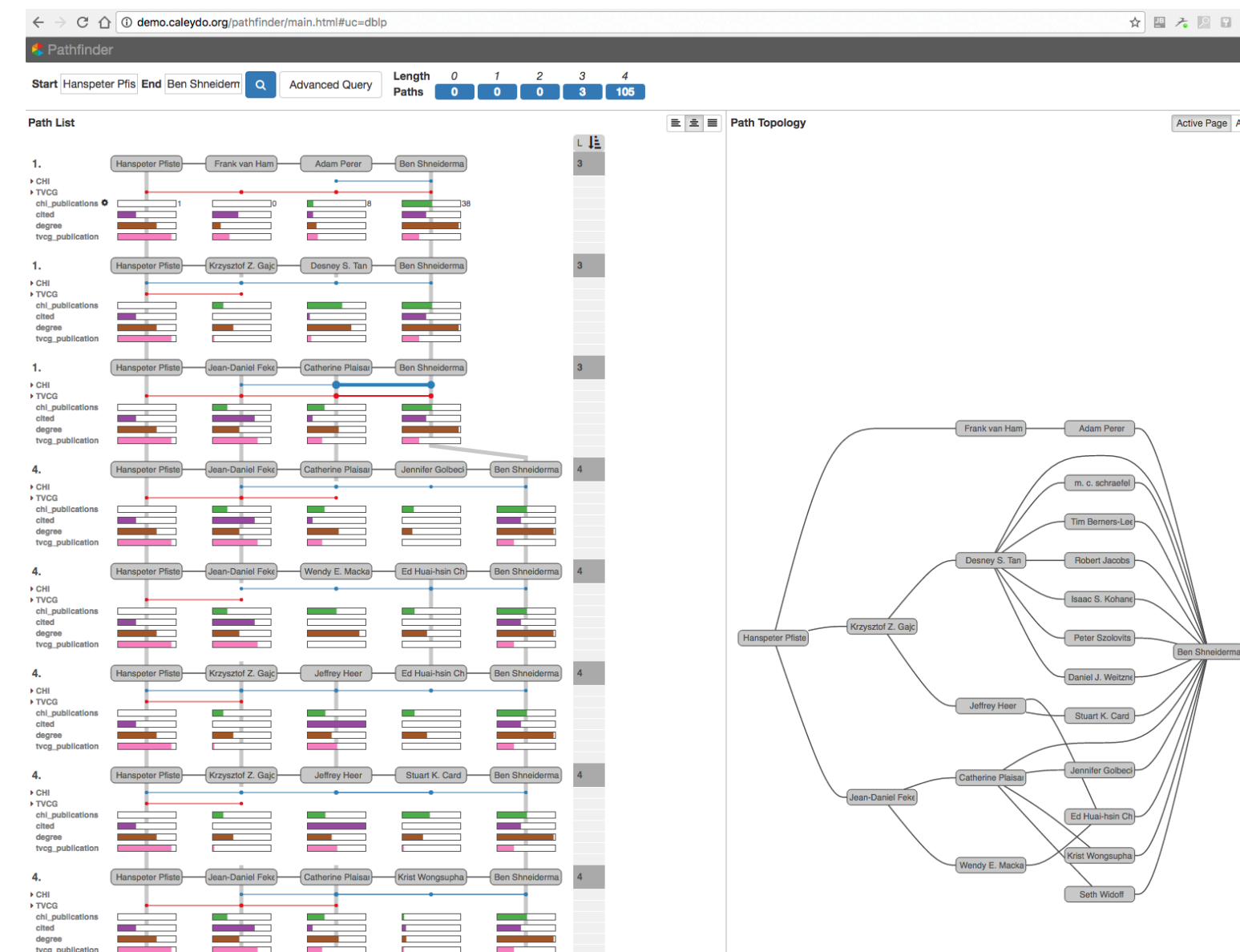
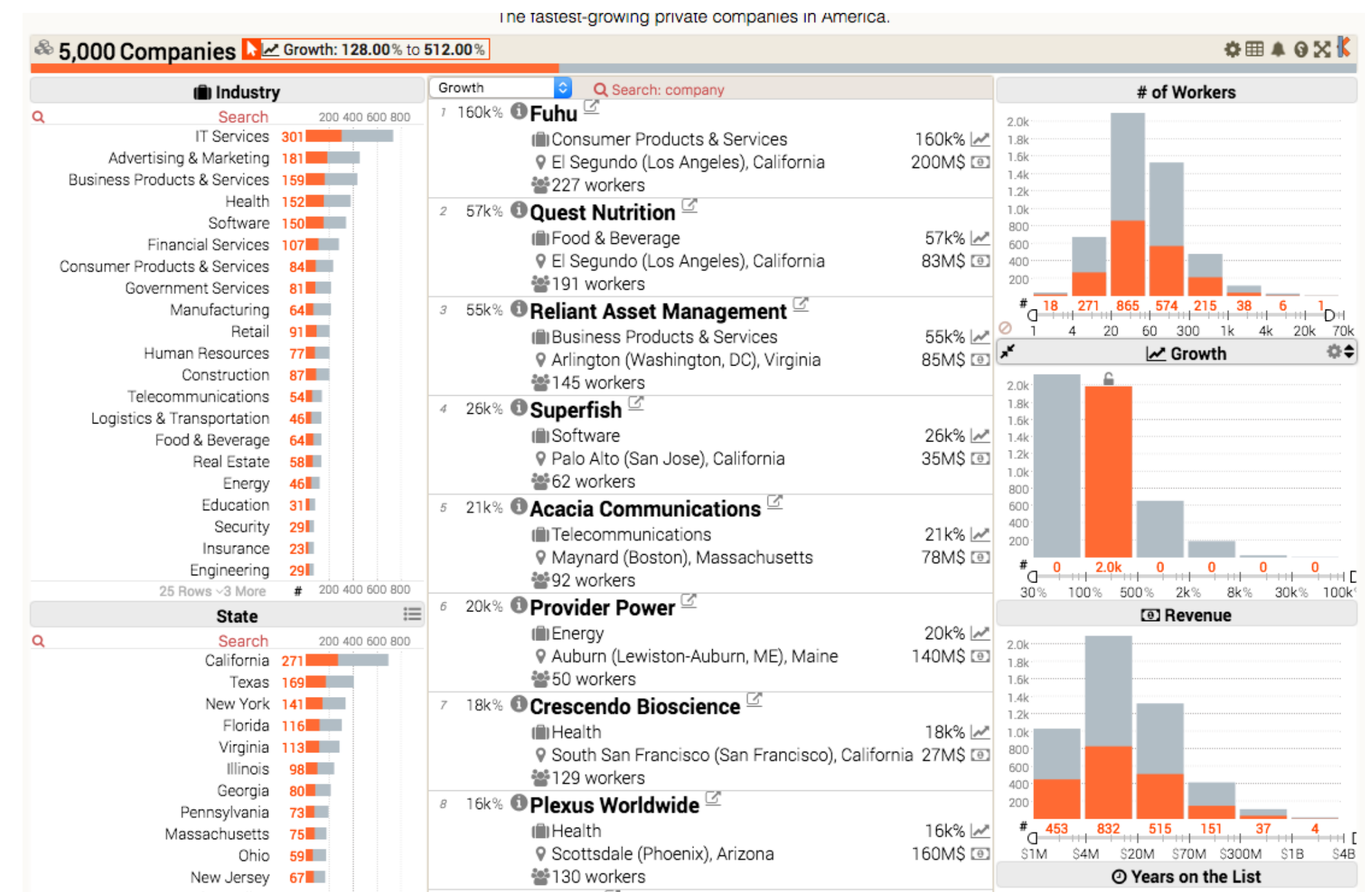
Linked Highlighting

Same Data Different View

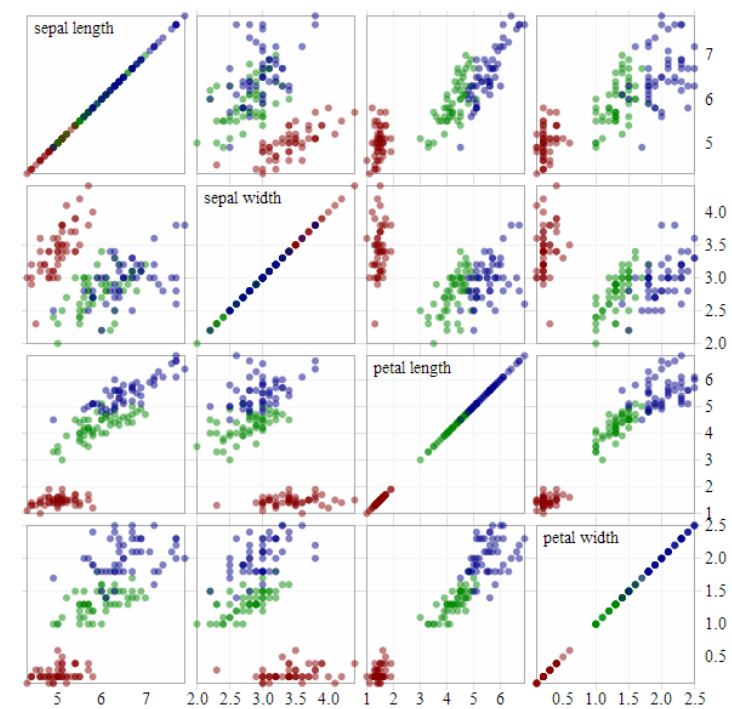
Different Data

Small Multiples

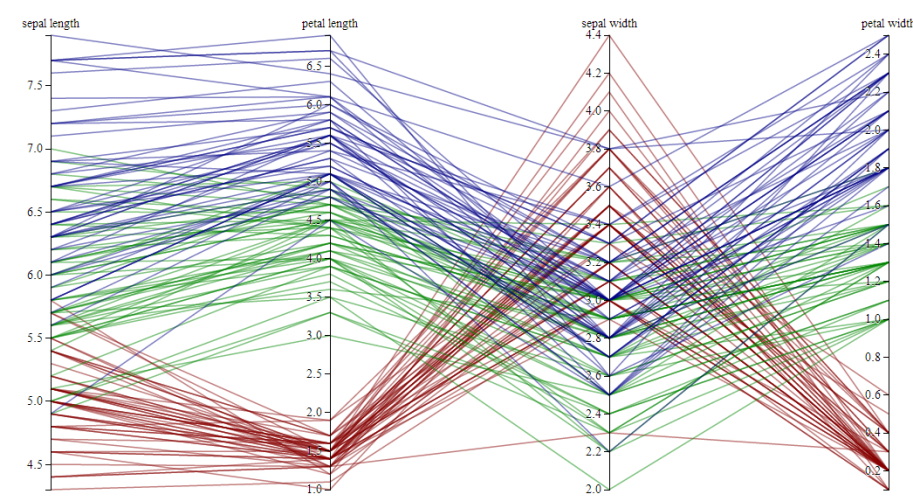
Partitioning



Tables



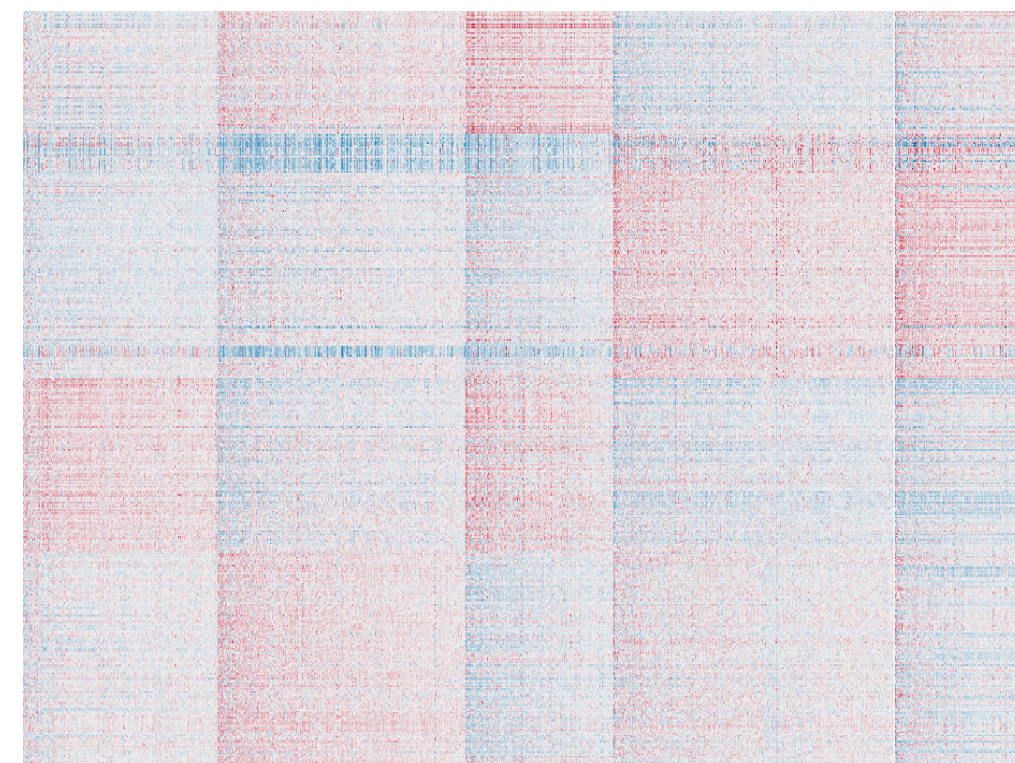
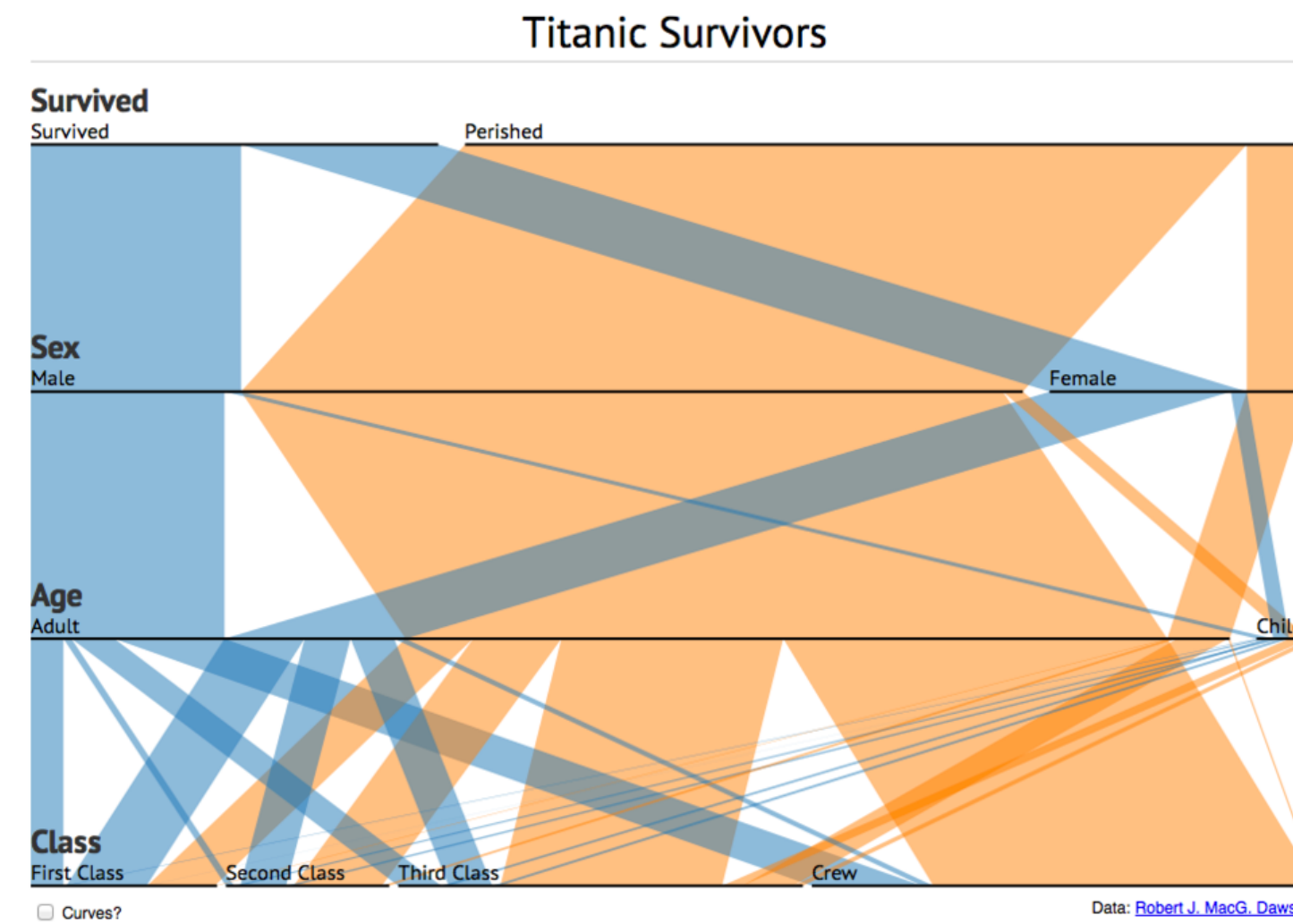
Scatterplot Matrices
[Bostock]



Parallel Coordinates
[Bostock]

Parallel Sets

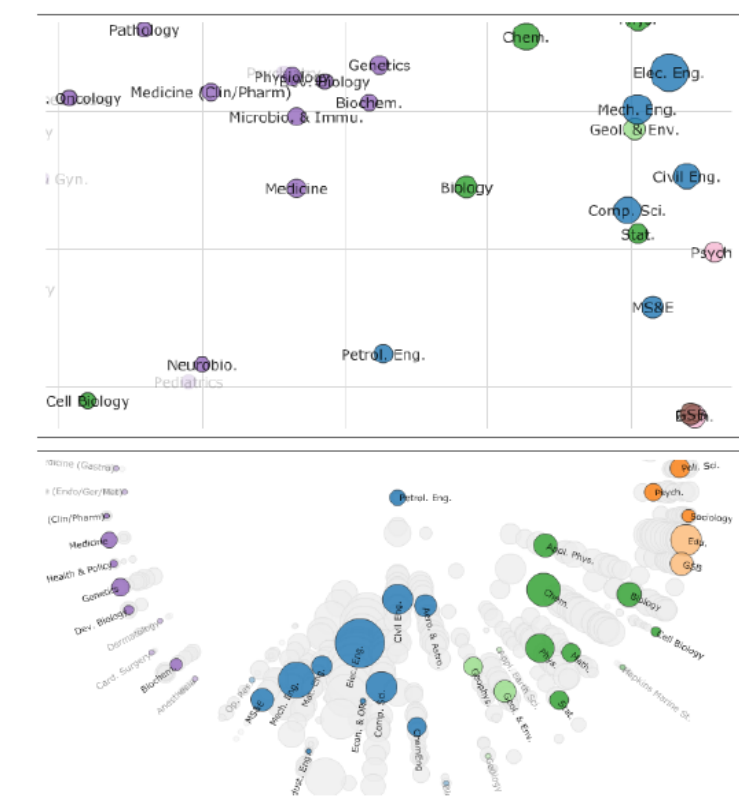
A visualisation technique for multidimensional categorical data.



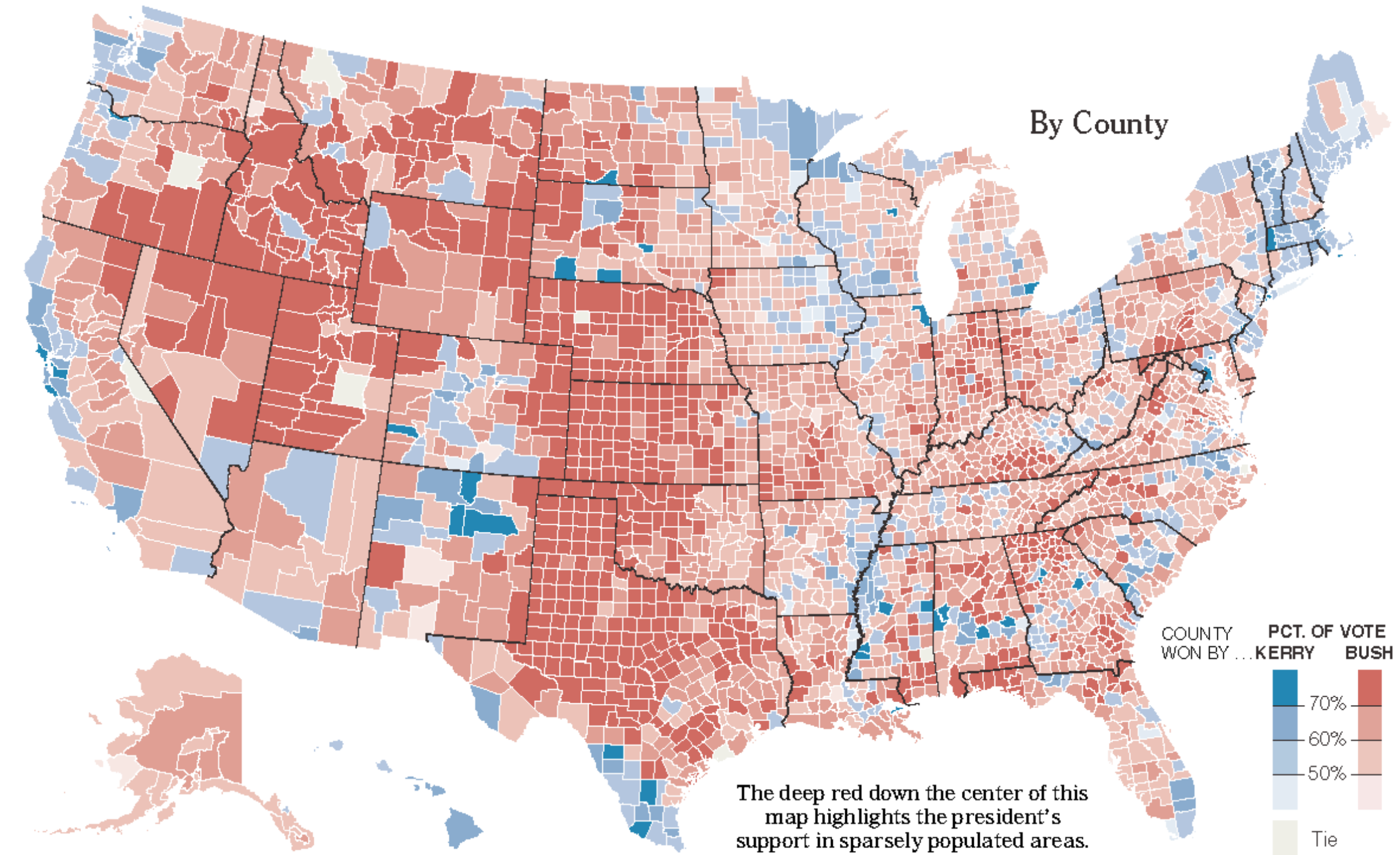
Pixel-based visualizations /
heat maps



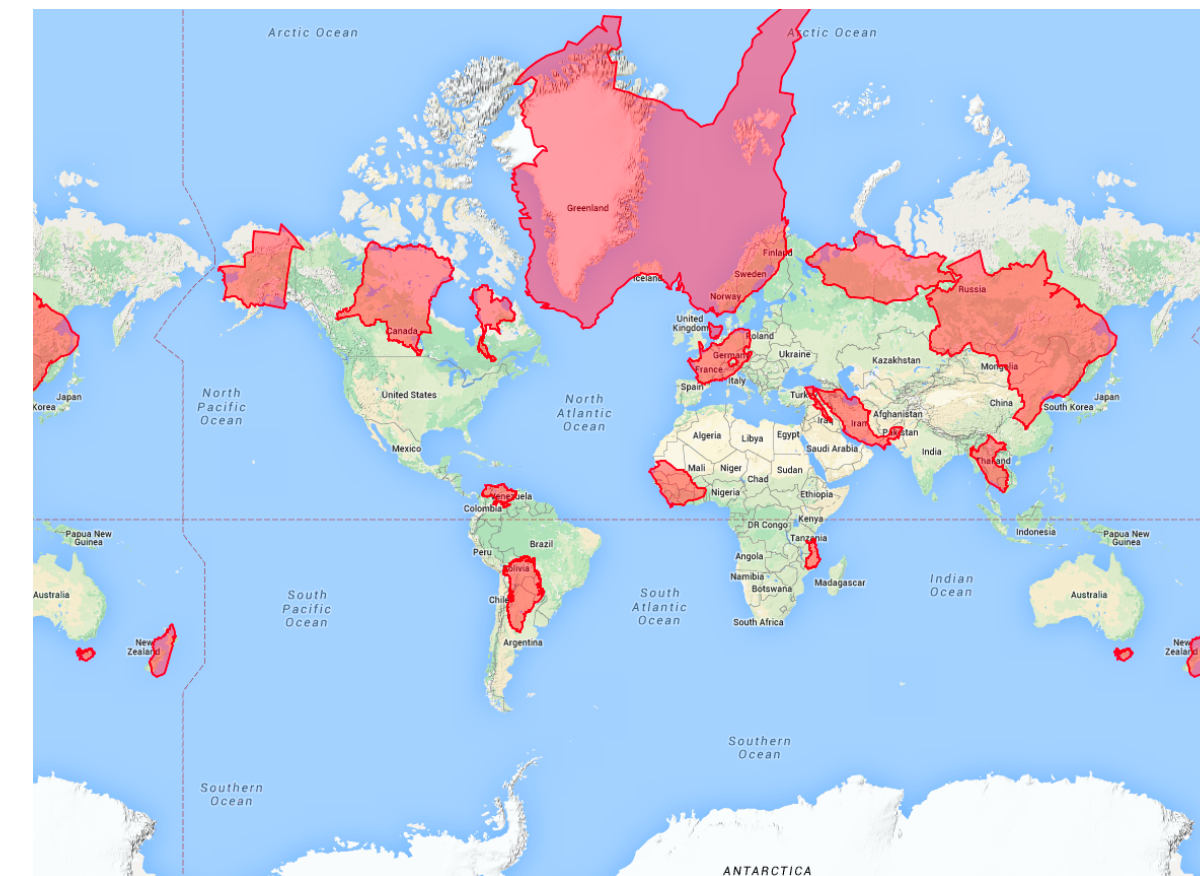
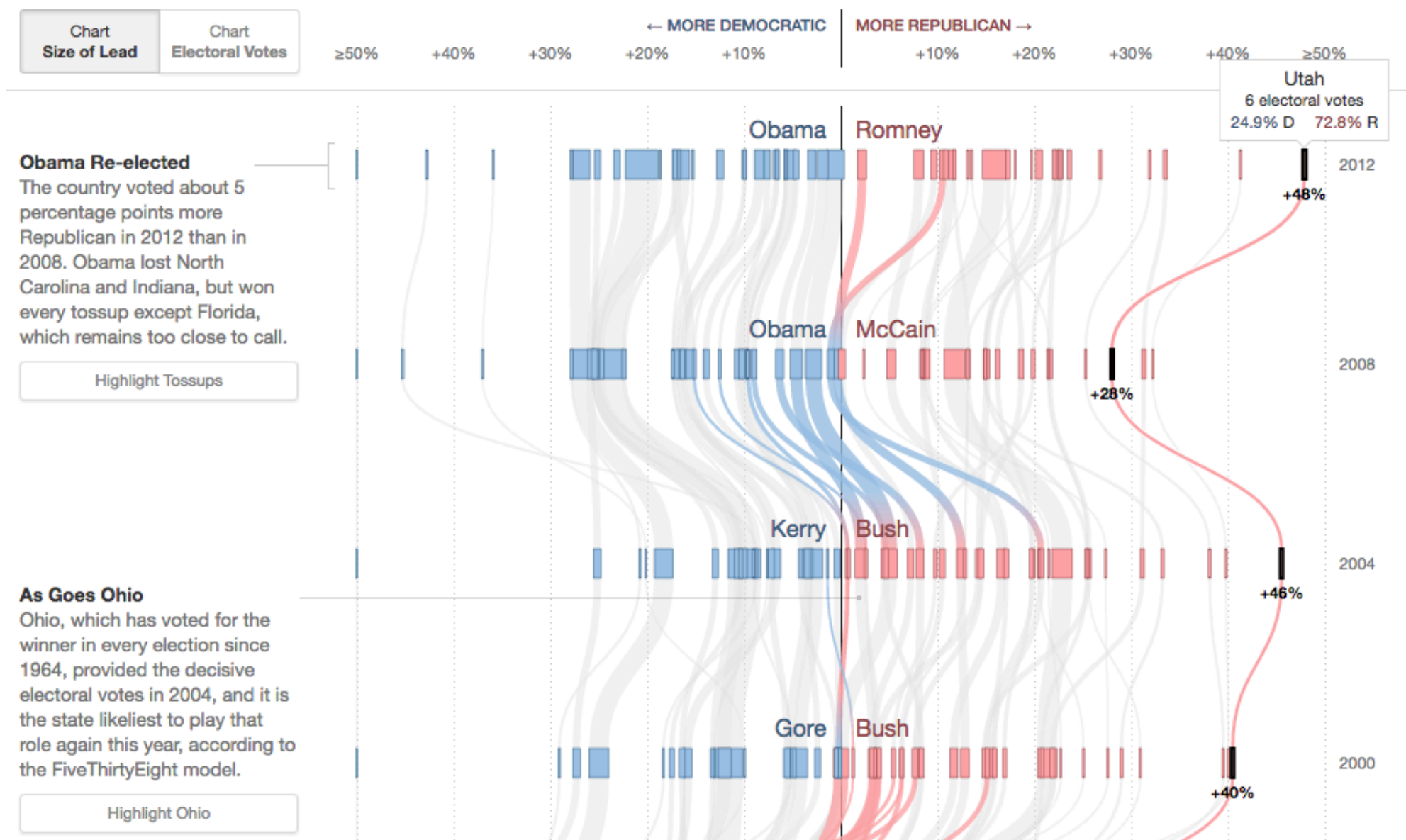
Multidimensional Scaling
[Doerk 2011]



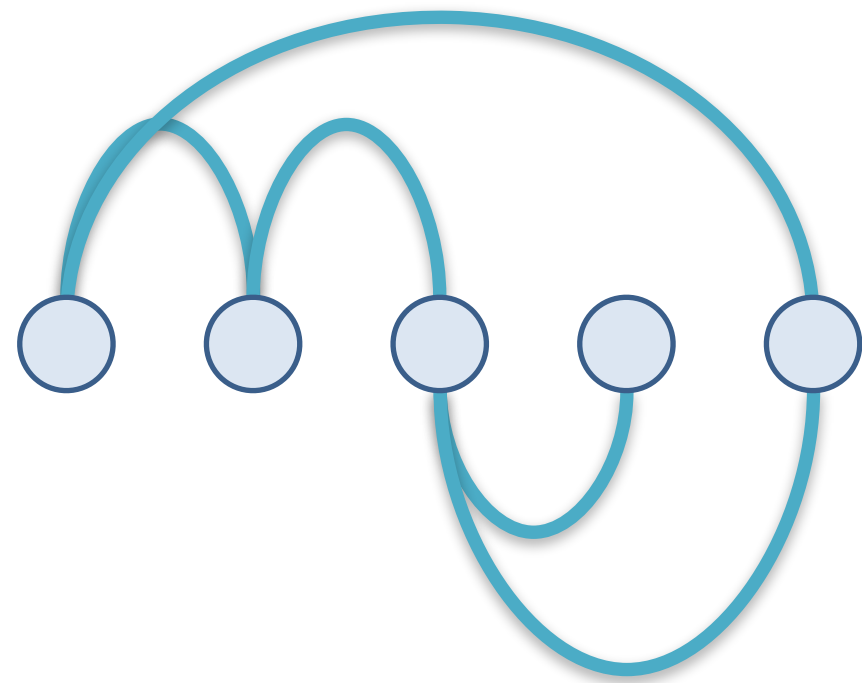
Maps



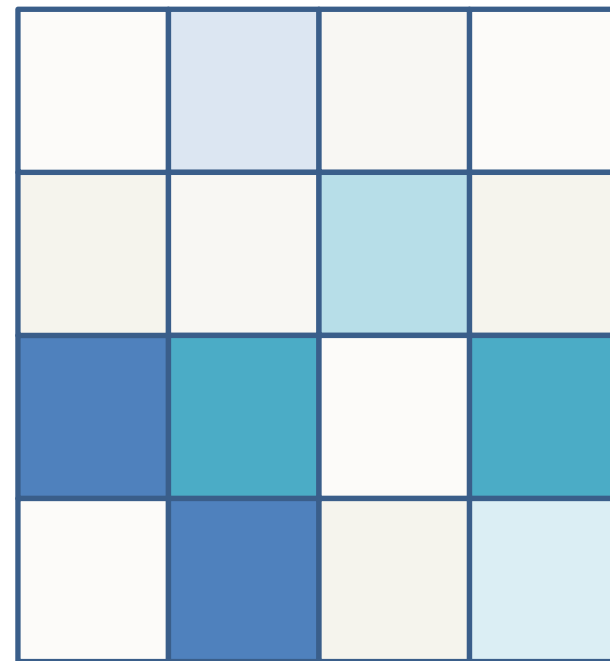
The deep red down the center of this map highlights the president's support in sparsely populated areas.



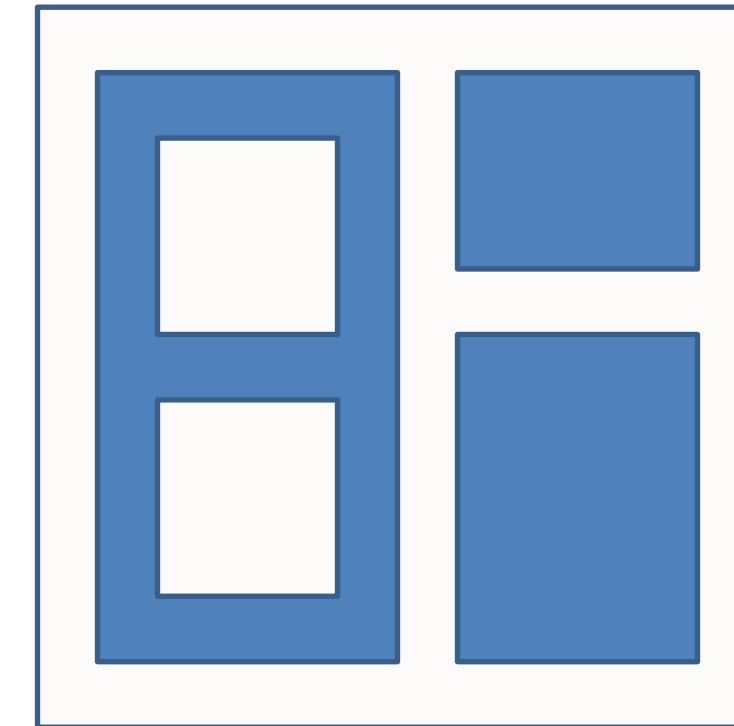
Networks



Explicit
(Node-Link)



Matrix



Implicit

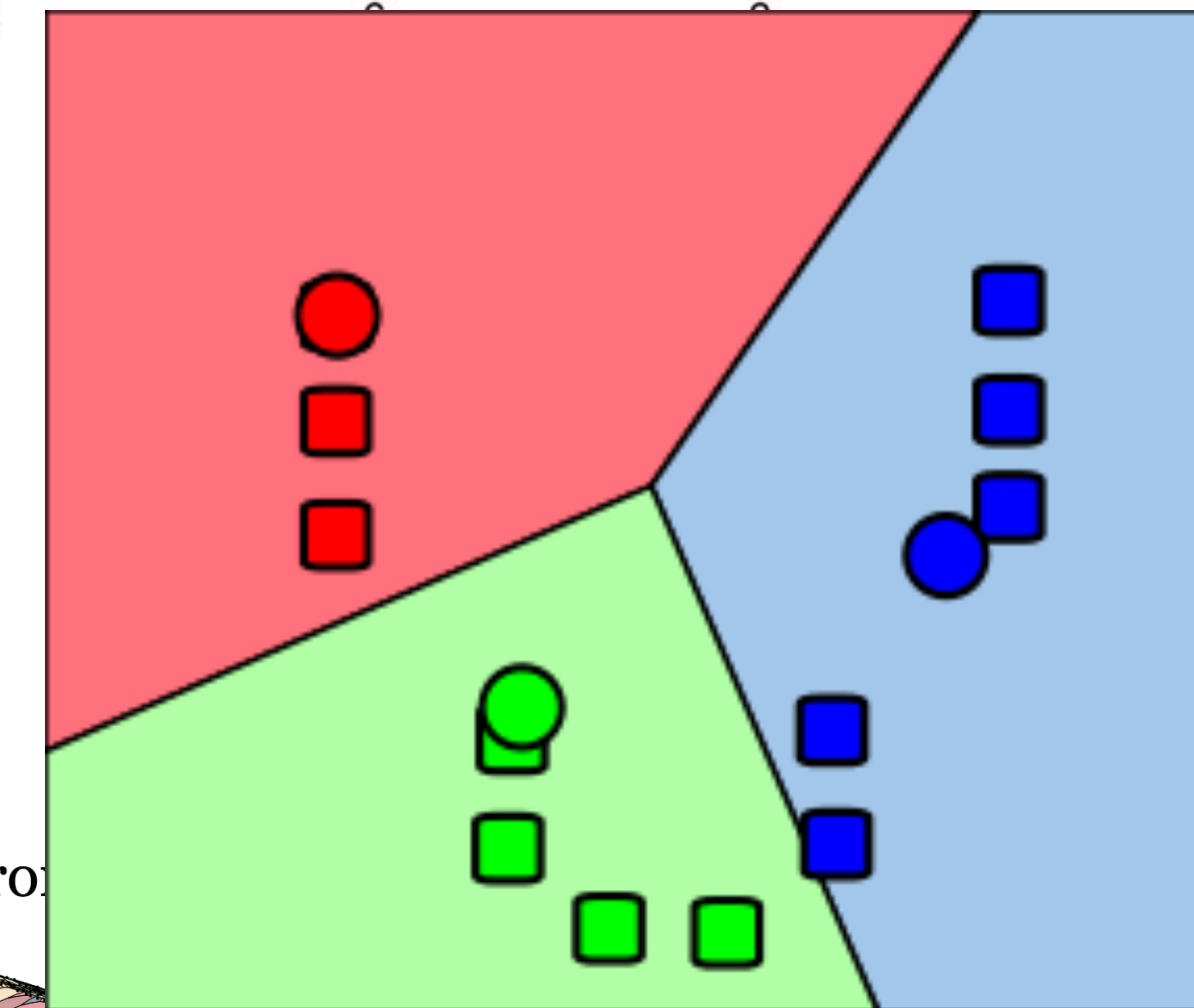
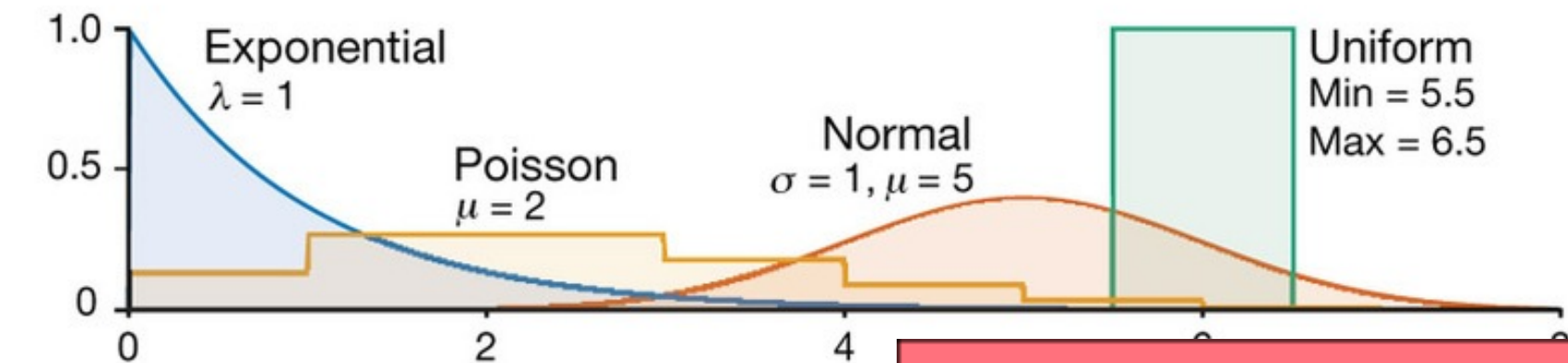
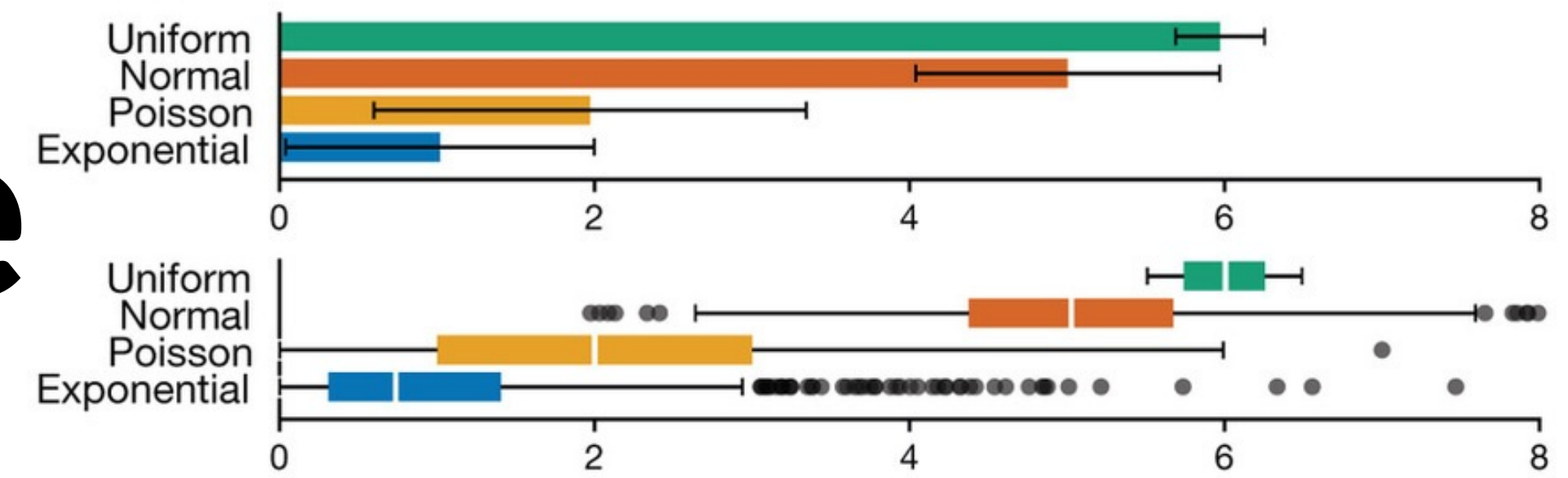
Filter & Aggregate

Eliminate Uninteresting Items

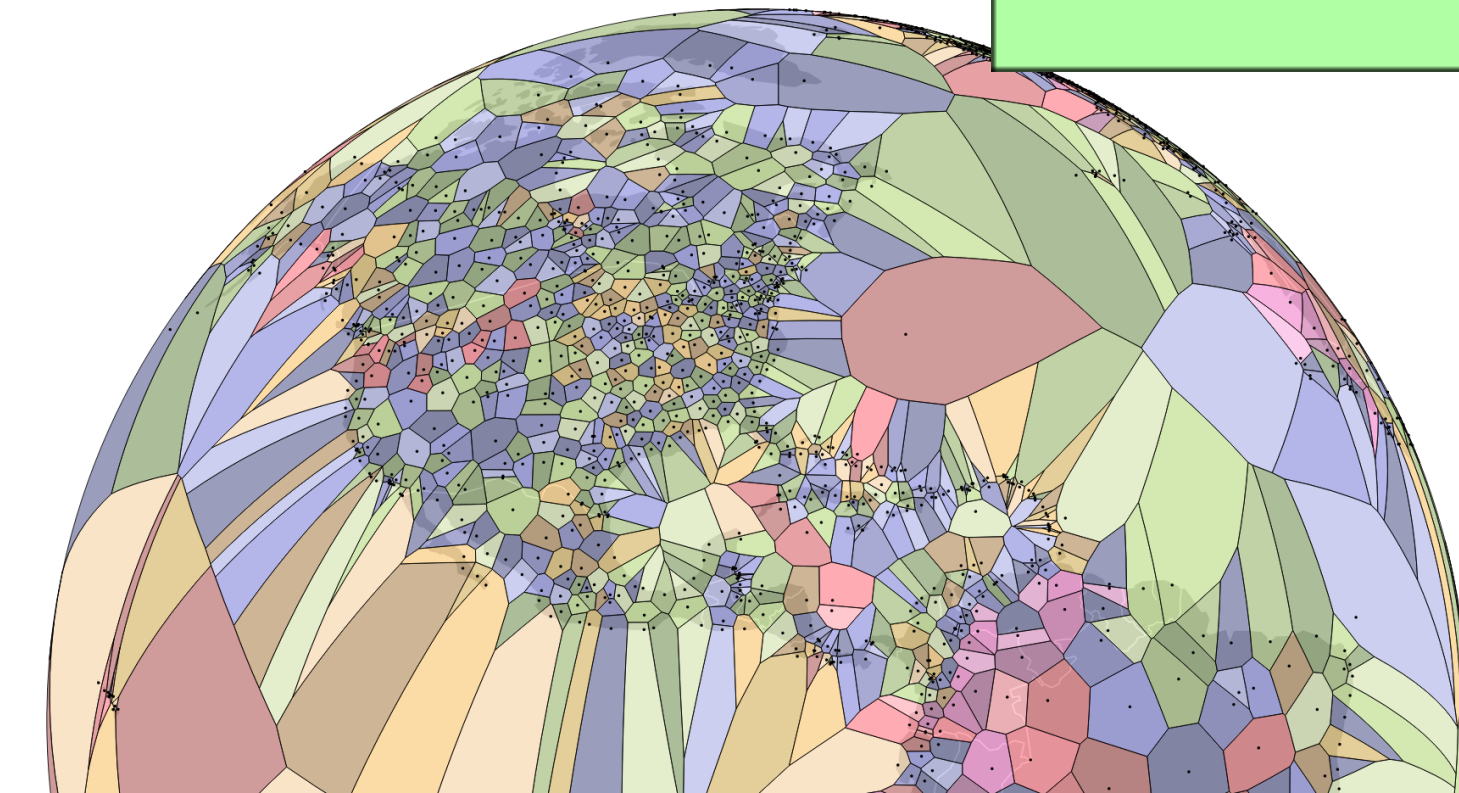
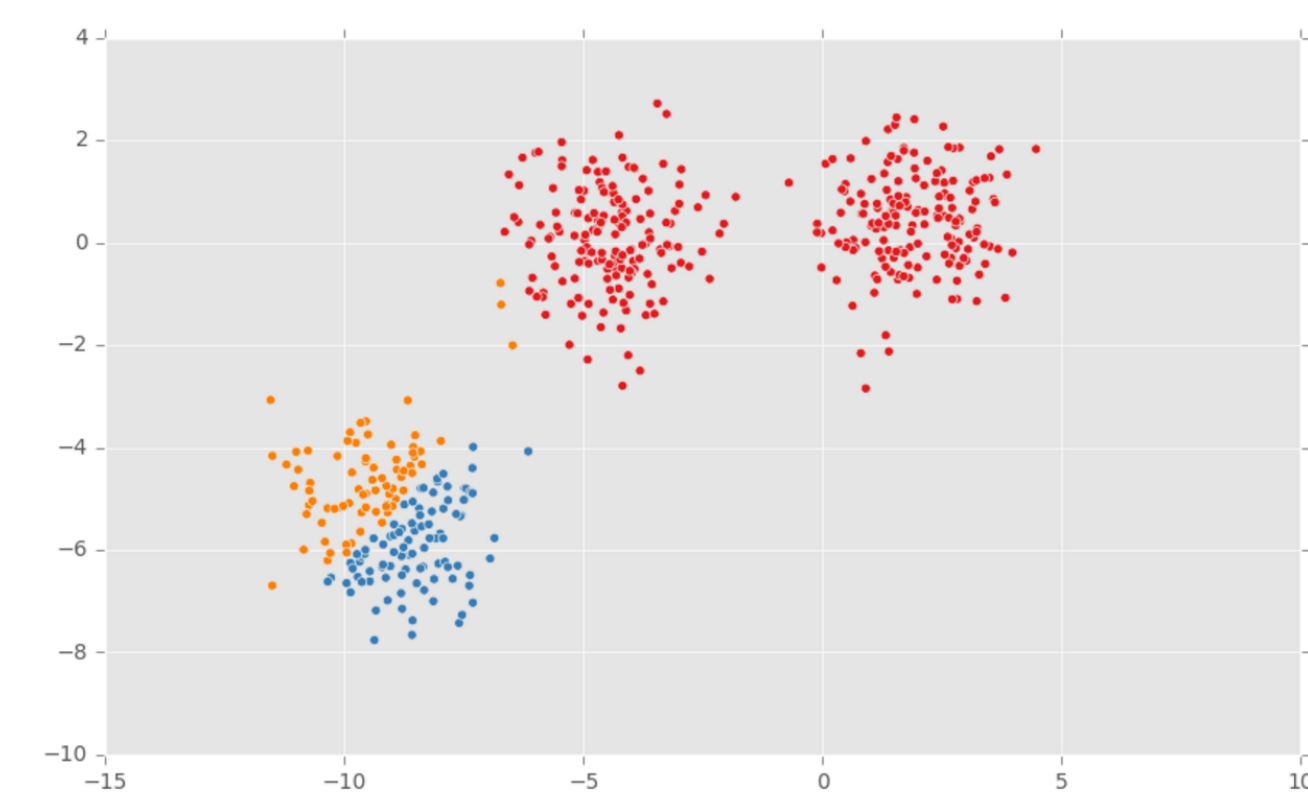
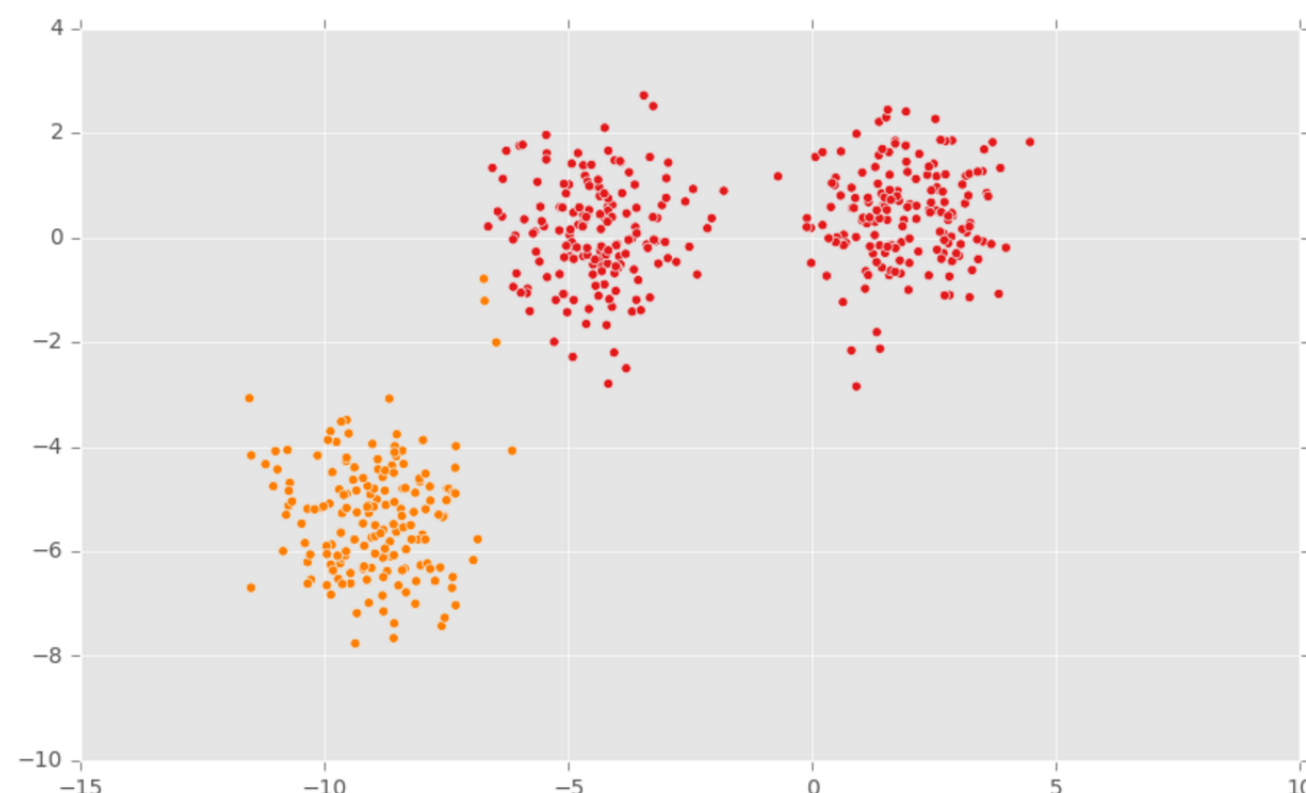
Group similar items

Clustering

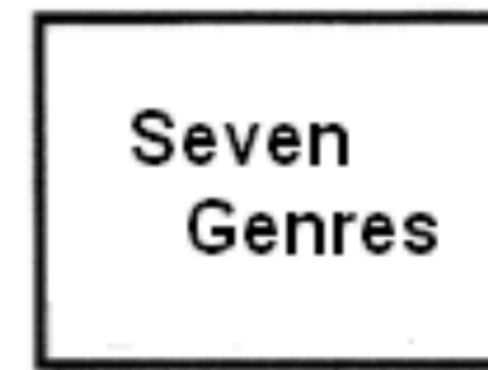
Dimensionality Reduction



World Airports Voronoi



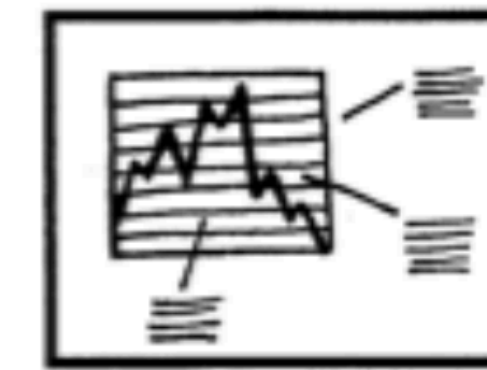
Storytelling



Seven Genres



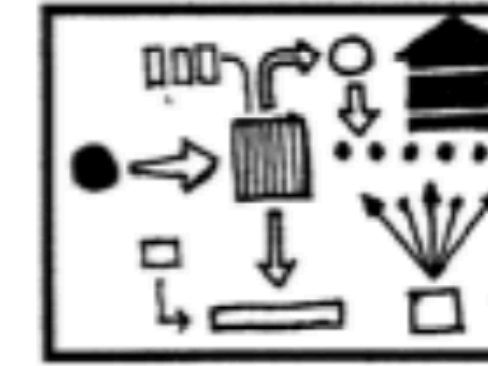
Magazine Style



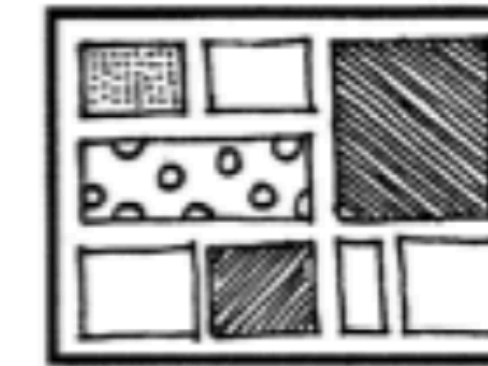
Annotated Chart



Partitioned Poster



Flow Chart



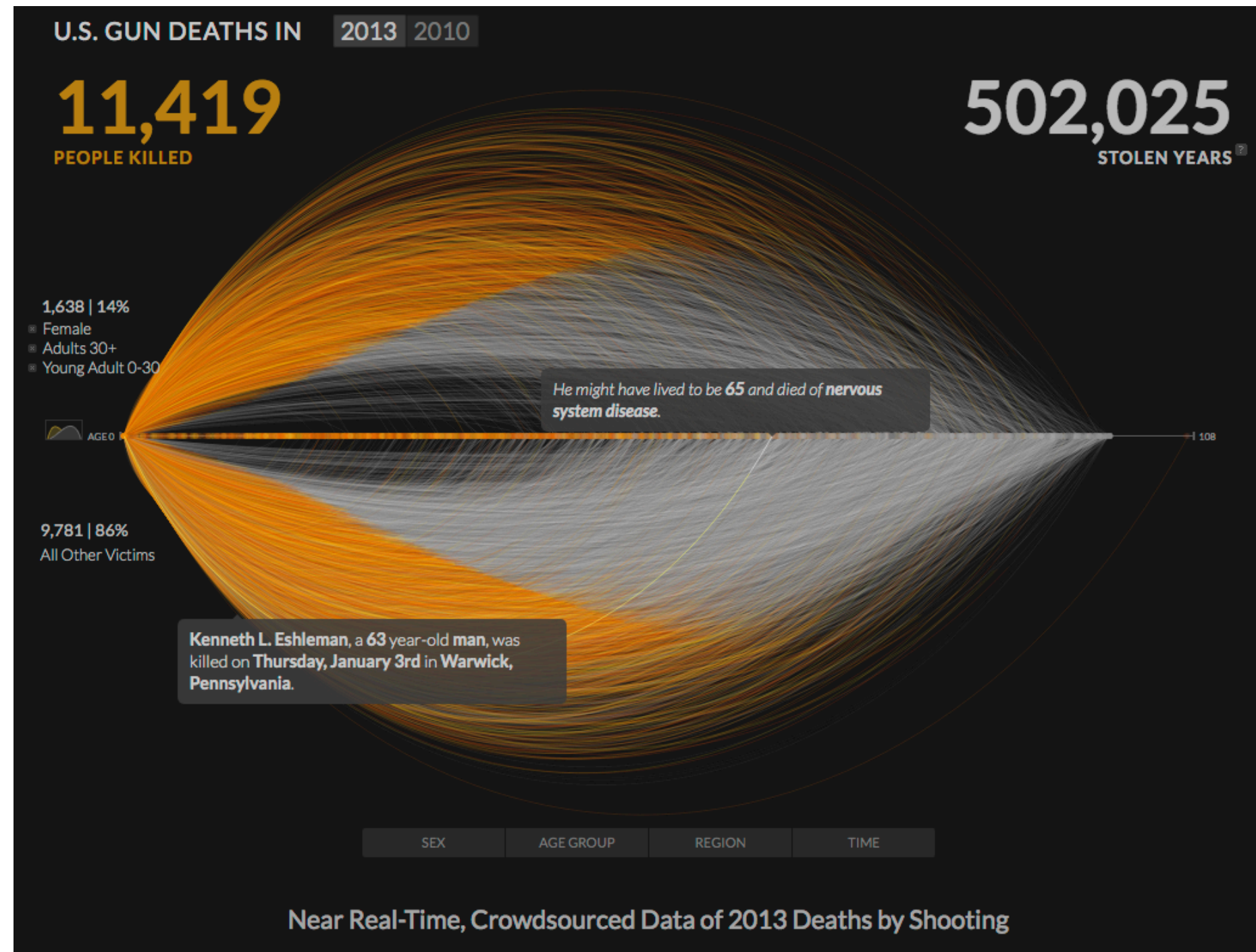
Comic Strip



Slide Show



Film/Video/Animation



755



Steroids or Not, the Pursuit Is On

Barry Bonds is taking aim at the career home run record. He needs only six more to tie Babe Ruth and 47 to equal Hank Aaron.

Lines are cumulative home runs.

Hank Aaron
755 homers
23 seasons

Babe Ruth
714 homers
22 seasons

Barry Bonds
708 homers
20 seasons

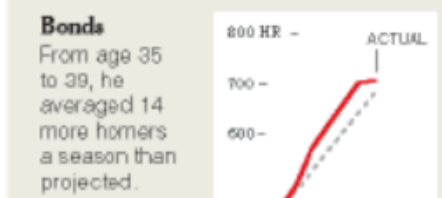
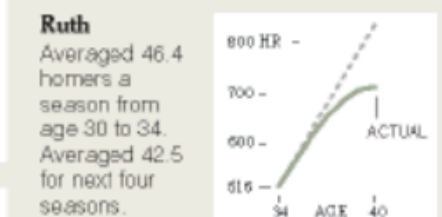
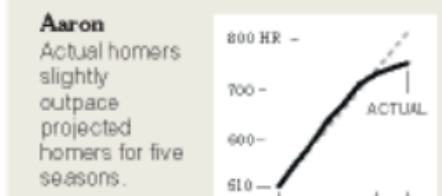
Bonds takes lead
Home runs after 16 seasons
Bonds 567
Aaron 554
Ruth 516

23 seasons
Bonds was injured last season. He played 14 games and hit 6 homers.

Homer Pace After Age 34

If the accusations are correct, Bonds was 34 in his first season on steroids. Here are projected home run paces for each player after age 34.

PROJECTED PACE BASED ON AVERAGE OF PREVIOUS FIVE SEASONS

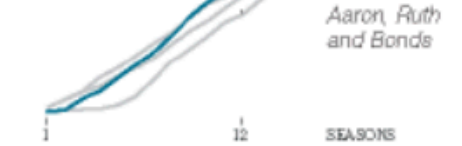


Note: Ages as of July 1 of each season.

Others Taking Aim

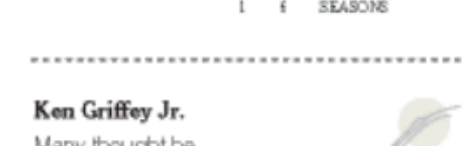


Alex Rodriguez
Is ahead of the pace set by all three home run leaders.



Albert Pujols

Averaging 40 homers a season, he has started stronger than the three leaders did.



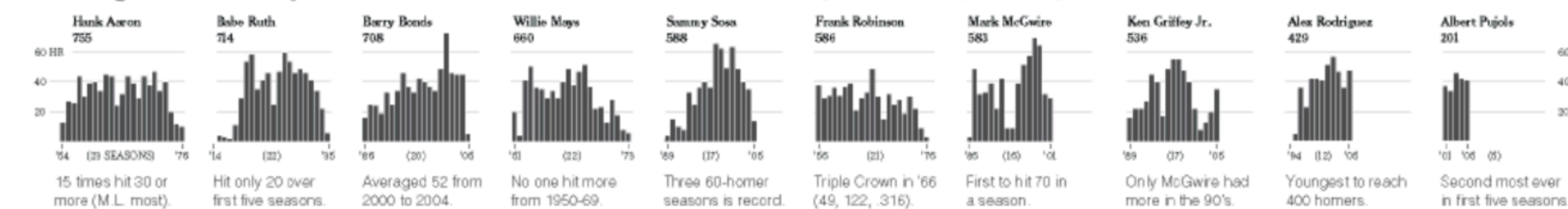
Ken Griffey Jr.

Many thought he would be the first to catch Ruth and Aaron until injuries limited his output.



Differing Paths to the Top of the Charts

The top seven players on the career home run list, along with a look at Griffey (12th), Rodriguez (37th) and Pujols (tied 257th).



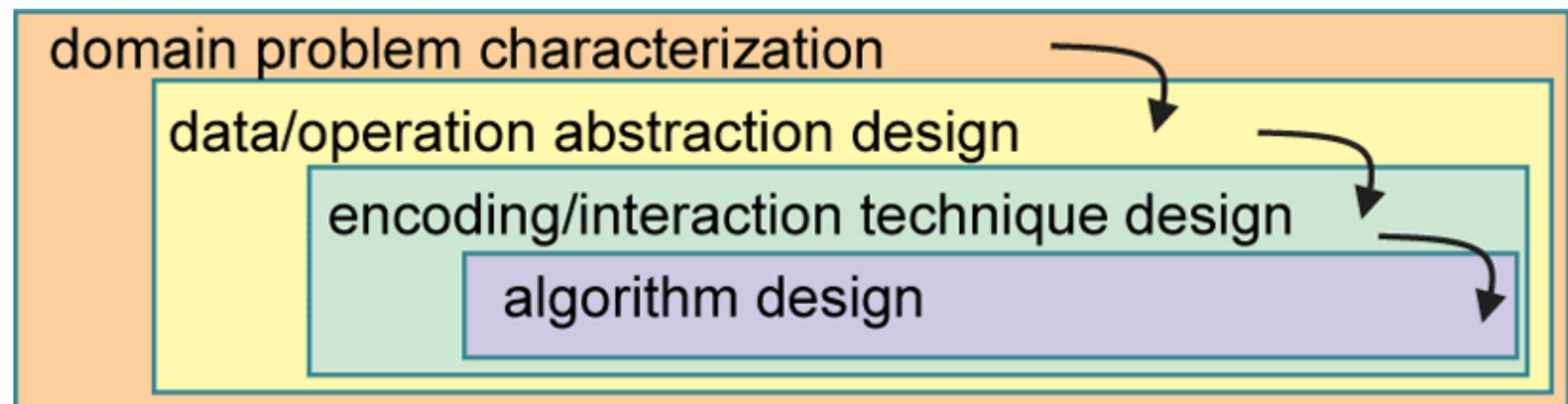
Design/Evaluation



serial



parallel



Opportunities

Classes & Other Opportunities

Visualization Seminar - CS 7942

Advanced Data Visualization - CS 6956

Vis for Scientific Data - CS 6636

Independent Study in VDL:

<http://vdl.sci.utah.edu/>

Human-Centered Computing

CS 6540 - HCI (Fall)

CS 6963 - Advanced HCI (Spring)

ED PS 6010 - Intro Statistics and Research Design

DES 5710 - Product Design and Development

ANTH 6169 - Ethnographic Methods

ED PS 6030 - Introduction to Research Design

CS 7940 - Human-Centered Computing Seminar

MS IN COMPUTING: **HUMAN-CENTERED COMPUTING**

In human-centered computing (HCC) the design and development of technology is motivated by the needs of people. HCC focuses on understanding how people use technology, creating new and accessible technology that enables novel interactions, and evaluating how technology impacts and supports people in the world. The core methods and techniques in HCC are grounded in computer science, but are also draw on social science and design. Current HCC focus areas in the School of Computing include personal informatics, mobile interaction, visualization, games, and privacy.

TRACK FACULTY

Erik Brunvand, Rogelio E. Cardona-Rivera, Tamara Denning, Alexander Lex, **Miriah Meyer (track director)**, Jason Wiese, R. Michael Young

CORE CLASSES: Required courses:

CS 6540	HCI
CS 6xxx	Advanced HCI
CS 6630	Visualization for Data Science
ED PS 6010	Introduction to Statistics and Research Design

ELECTIVES: 6 electives in total.

Pre-approved course list from within CS and across campus (1) Up to 3 electives can be taken from outside CS (2) Other electives require director approval

feedback

Feedback Please!

Were your expectations met?

What else would you have liked to learn about?

Did you feel prepared? Are the prerequisites appropriate?

Was it too much work? Was it too easy?

Too little programming? Too much programming?

Did you like JS/D3?

Did you enjoy the project?

Course Evaluation



<https://goo.gl/IbhkEr>

Please Take 5 Min to evaluate this course!

Evaluations are important for us to improve the course and our teaching!

Thanks!

To you for participating and coming to lectures!

To our TAs Devin, Haihan, Youjia, Jeff!