

# **Interaction**

## **Involving the Viewer**

February 21, 2012 – Michael Porath

# Where Are We?

## Fundamentals

Data

Image

Perception

Color

## Techniques

Interaction

Storytelling

## Types of visuali- zations

**Assignment 2**  
Working with data

**Assignment 3**  
Visualizing data set  
of your choice

**Assignment 4**  
Quantified Self

**Final Project**  
Interactive  
Visualization Project

# Where Are We?

You are  
here

## Fundamentals

Data

Image

Perception

Color

## Techniques

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Storytelling

## Types of visuali- zations

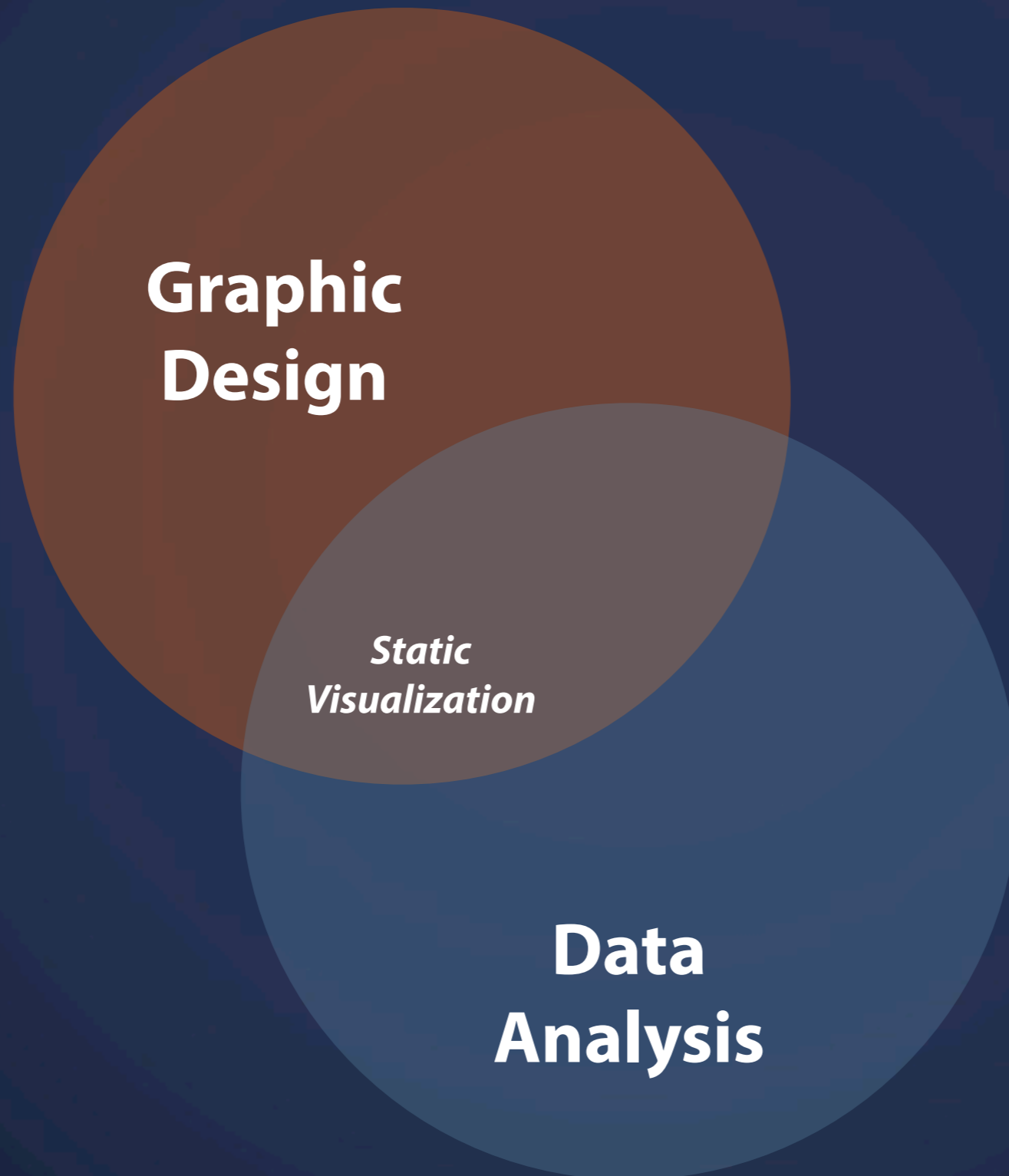
**Assignment 2**  
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**Assignment 3**  
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of your choice

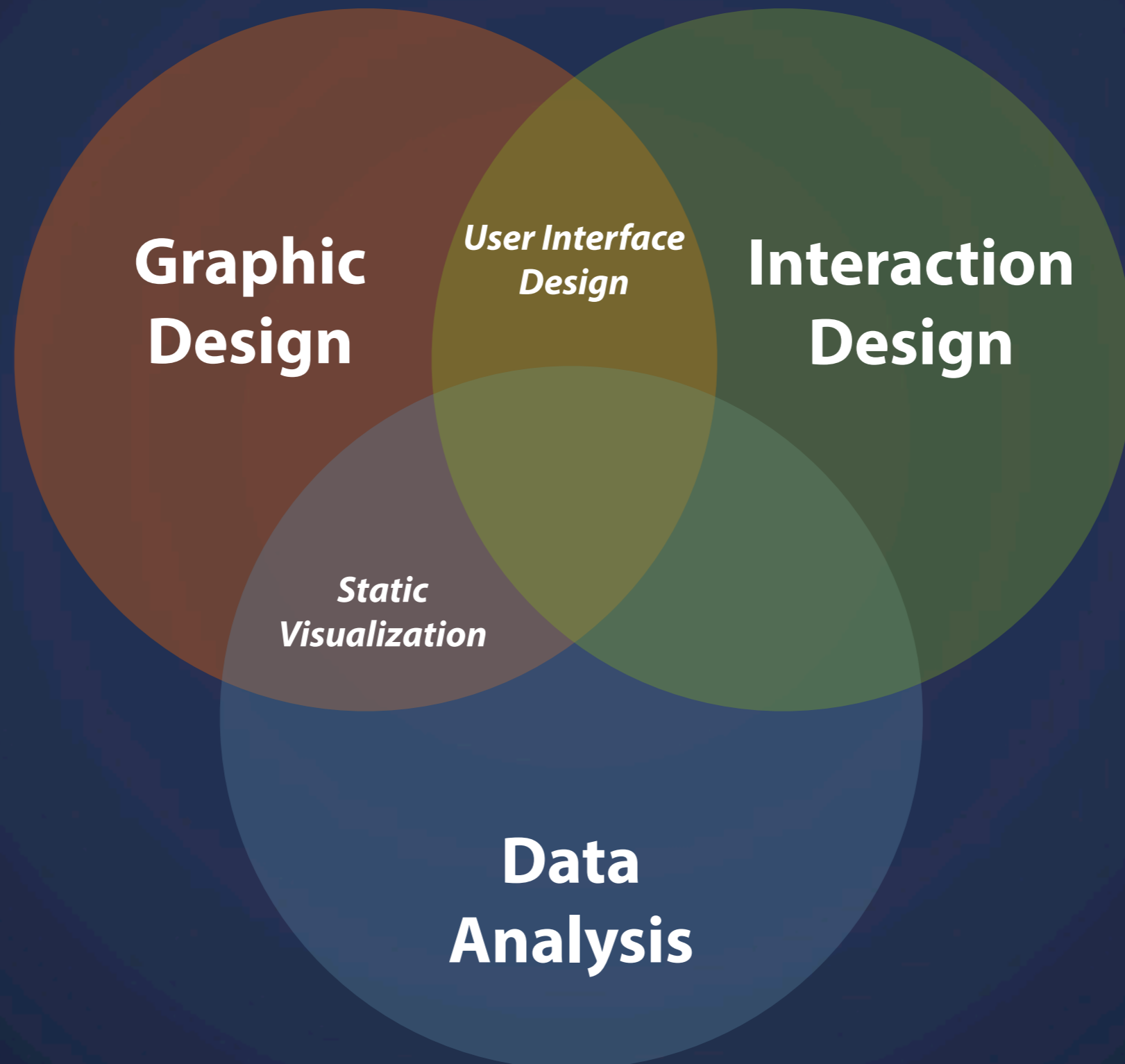
**Assignment 4**  
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Visualization Project

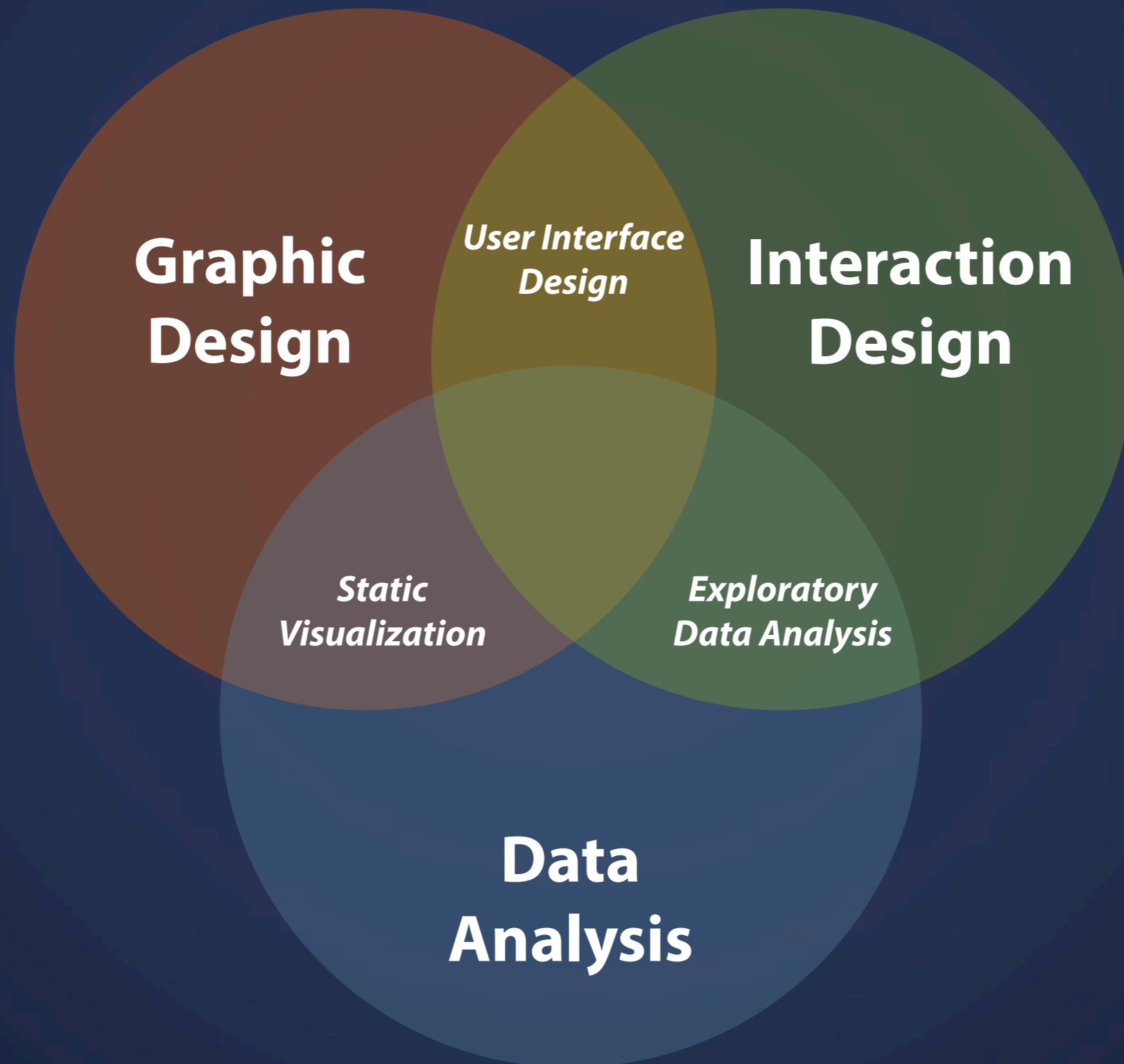
# Interactive Data Visualization



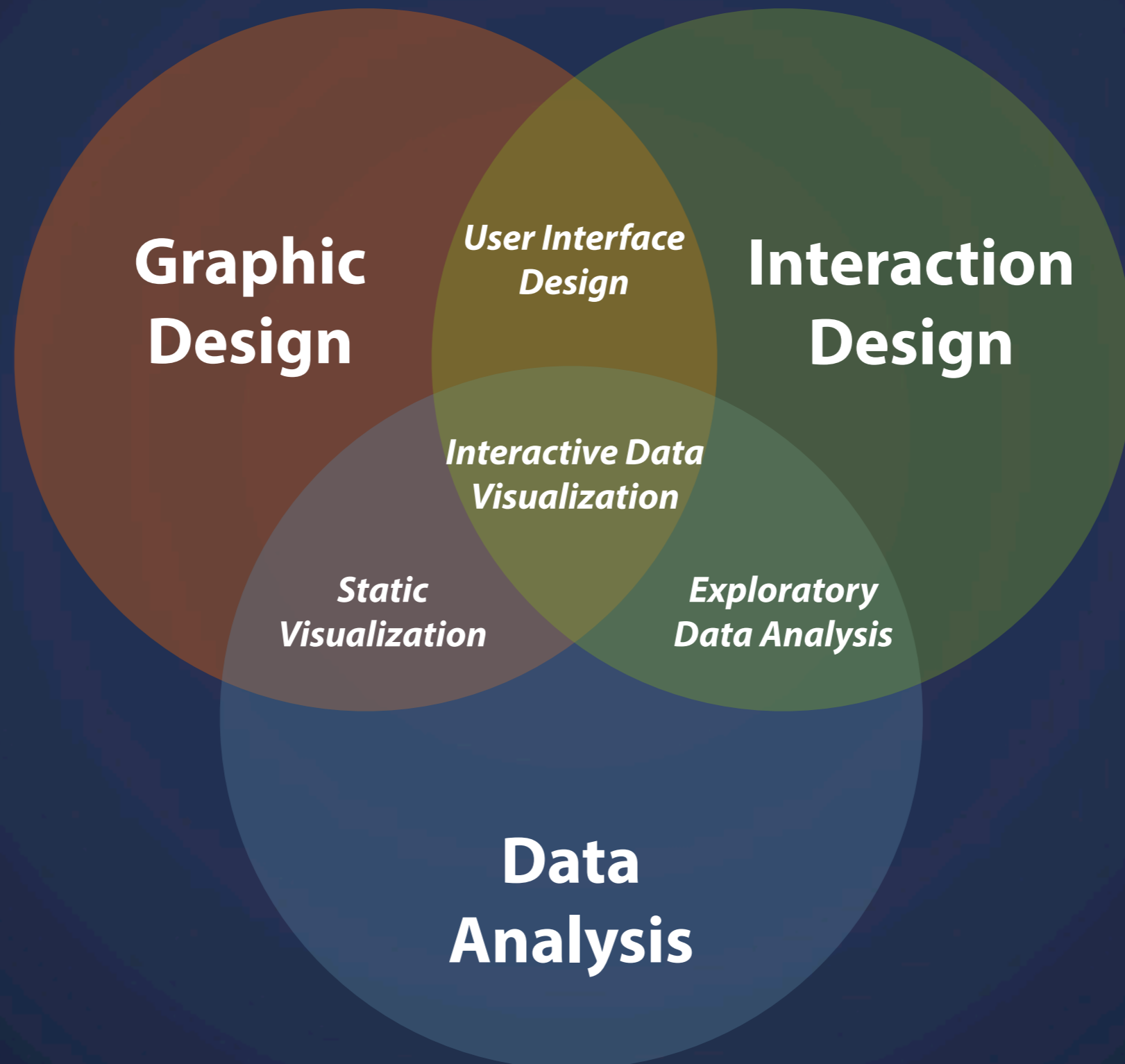
# Interactive Data Visualization



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# Why Interaction?

When is (static) representation not enough?



# Why Interaction?

When is (static) representation not enough?

## Scale

- Too many data points
- Too many different dimensions

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## Exploration

# Why Interaction?

When is (static) representation not enough?

## Scale

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- Too many different dimensions

## Storytelling

## Exploration

## Learning

# User Intent

Or once again: What's the Objective

**Select**

**Explore**

**Reconfigure**

**Encode**

**Abstract /  
Elaborate**

**Filter**

**Connect**

# User Intent

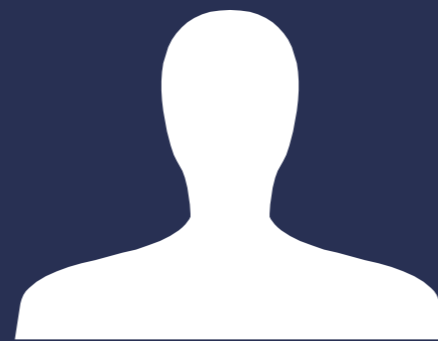
Or once again: What's the Objective

**Select**

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*User Intent*

**Abstract /  
Elaborate**

**Filter**

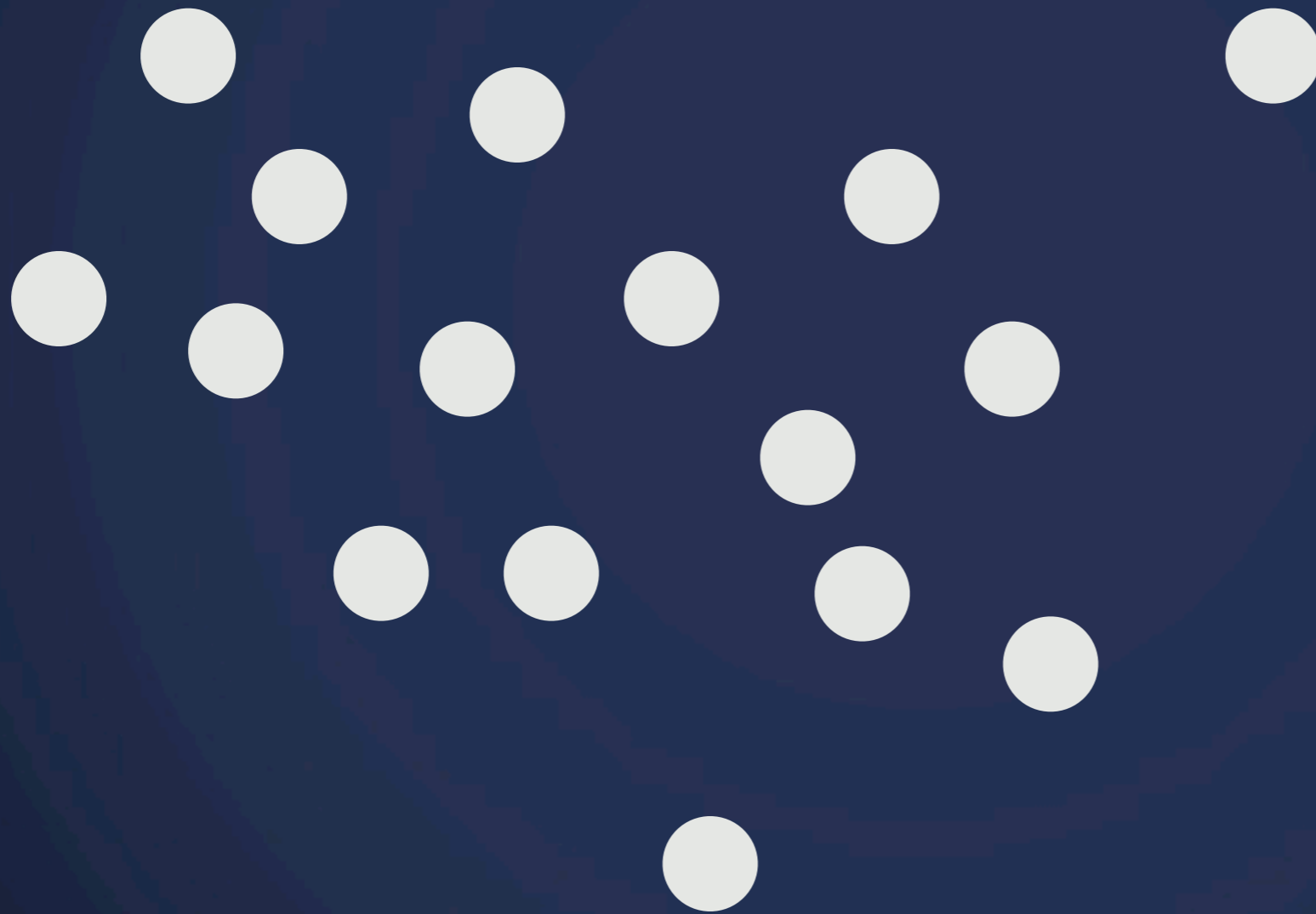
**Connect**

# **1. Select / Focus**

**Mark something interesting**

# 1. Select / Focus

Technique





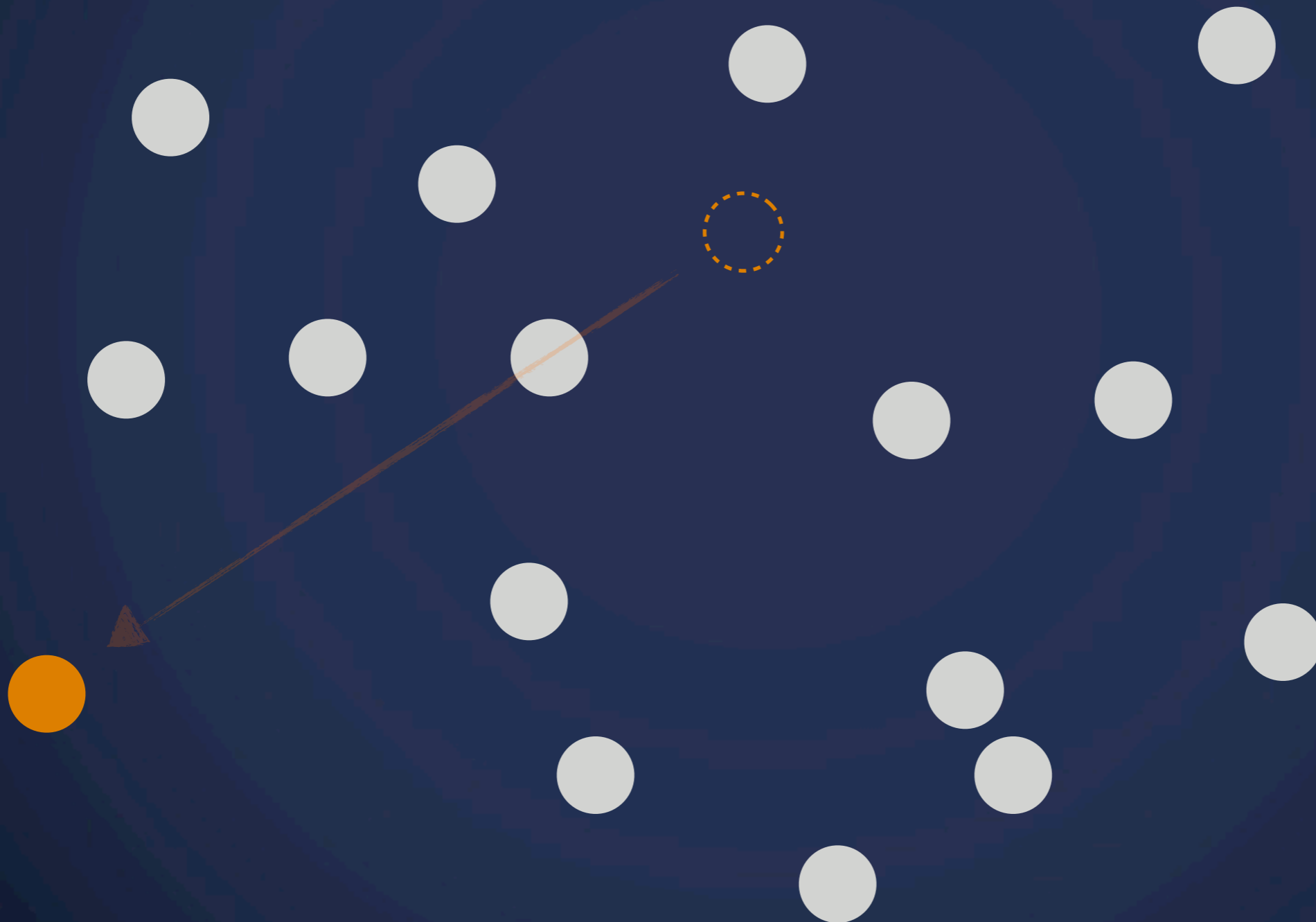
# 1. Select / Focus

Technique



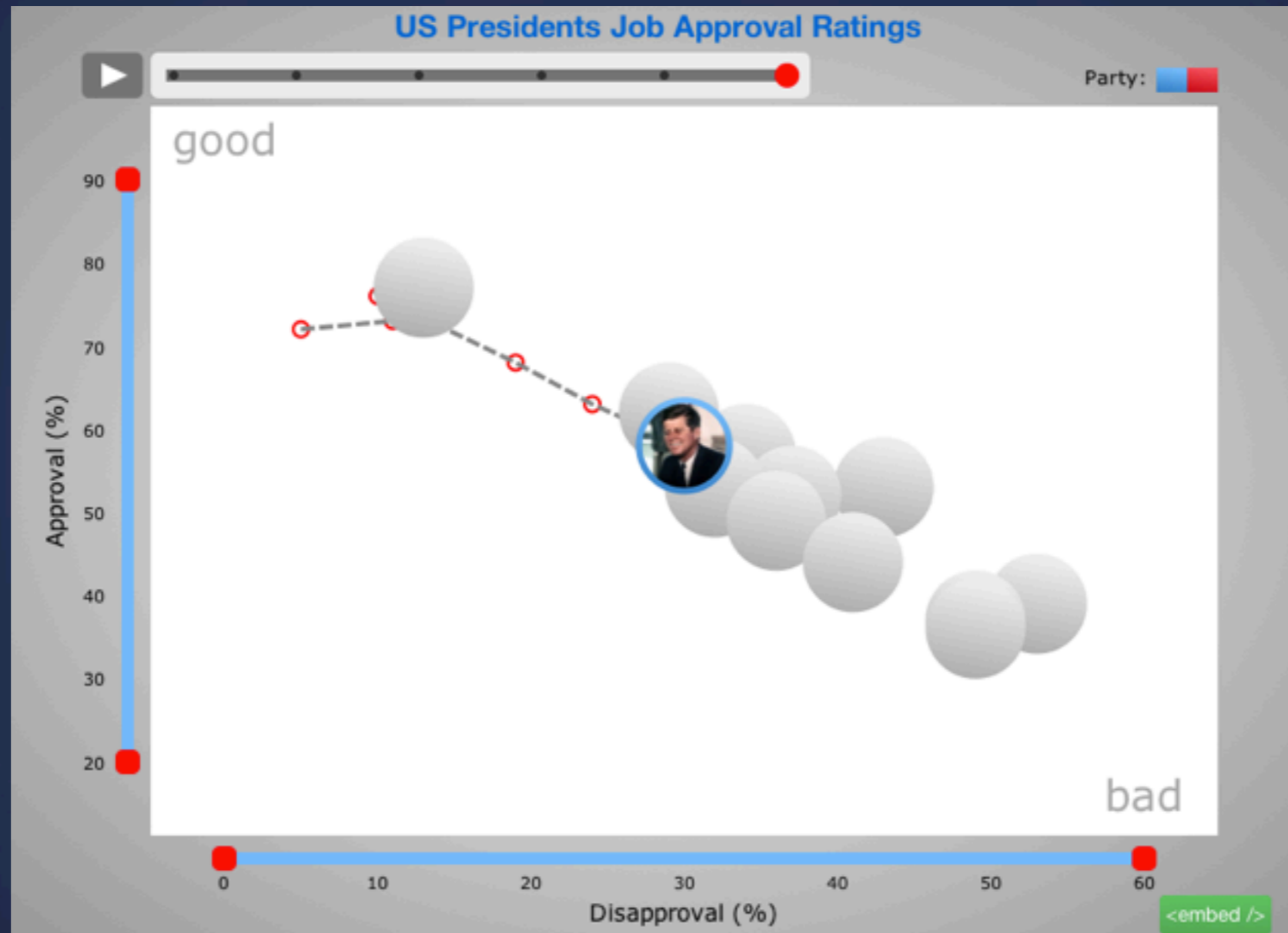
# 1. Select / Focus

Technique



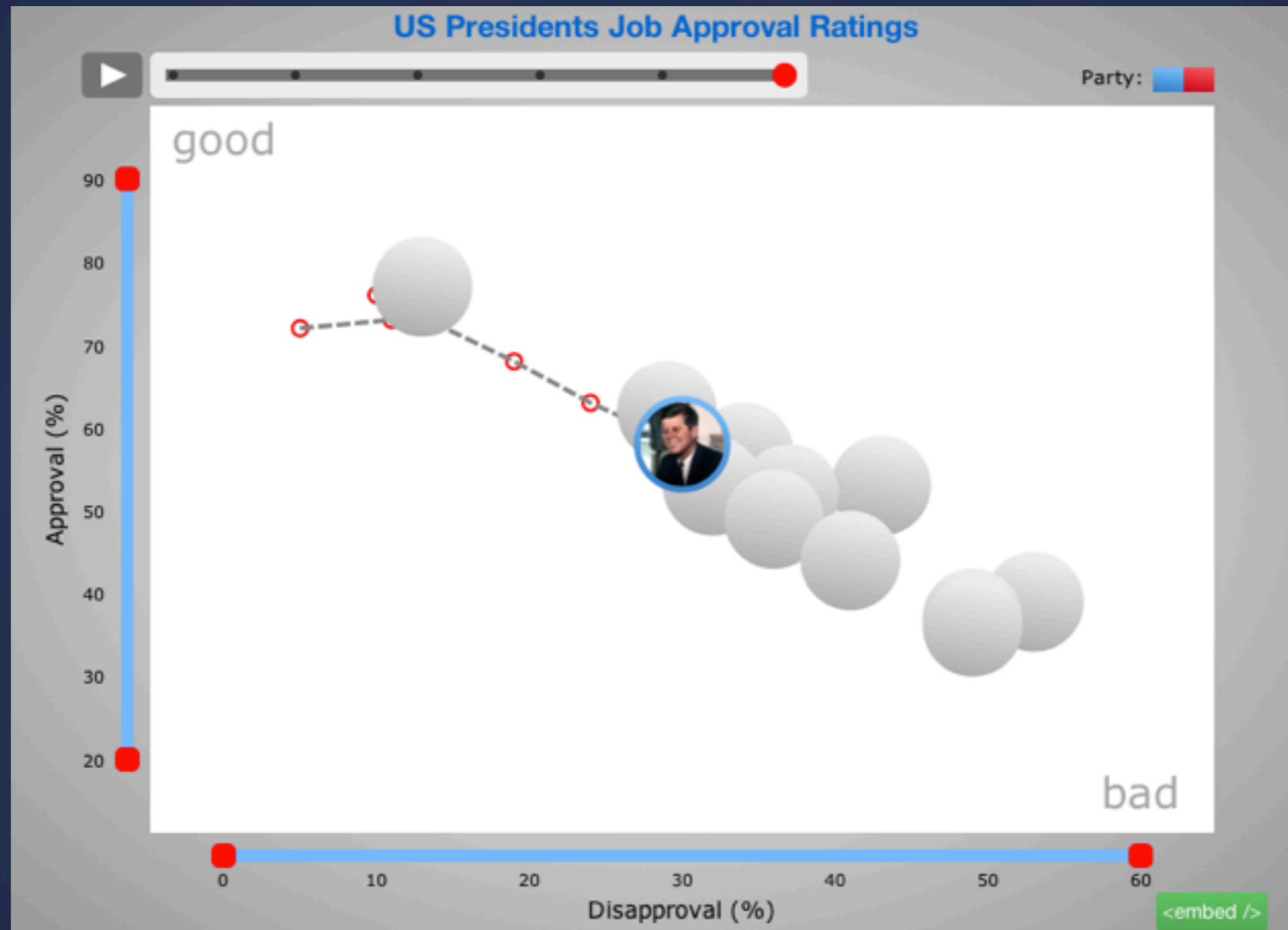
# Example

## US Presidents Job Approval Ratings



# Example

## US Presidents Job Approval Ratings



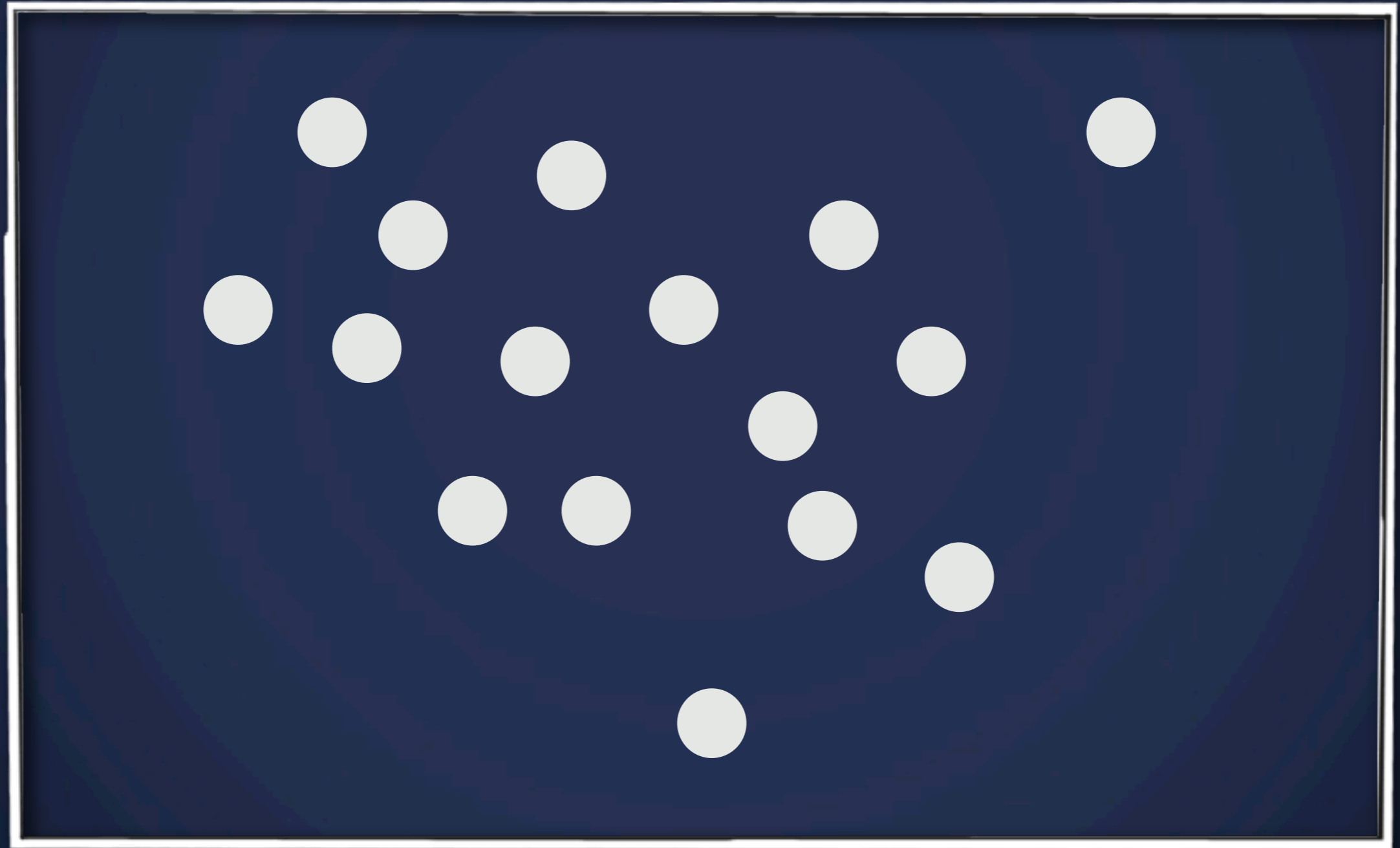
Pick a detail from a larger dataset to keep track of it.

# **2. Explore**

**Show something different**

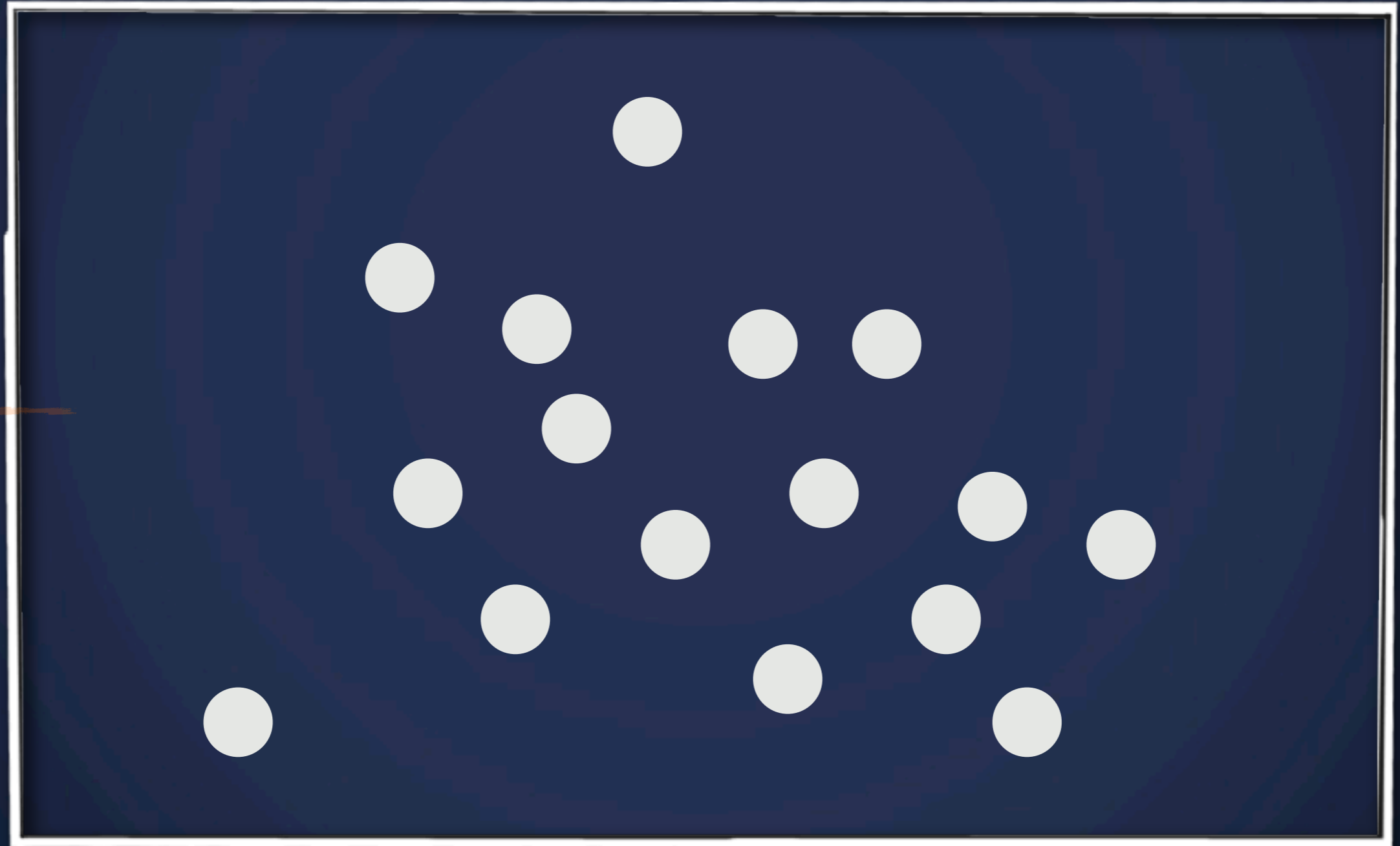
# 2. Explore

Technique



# 2. Explore

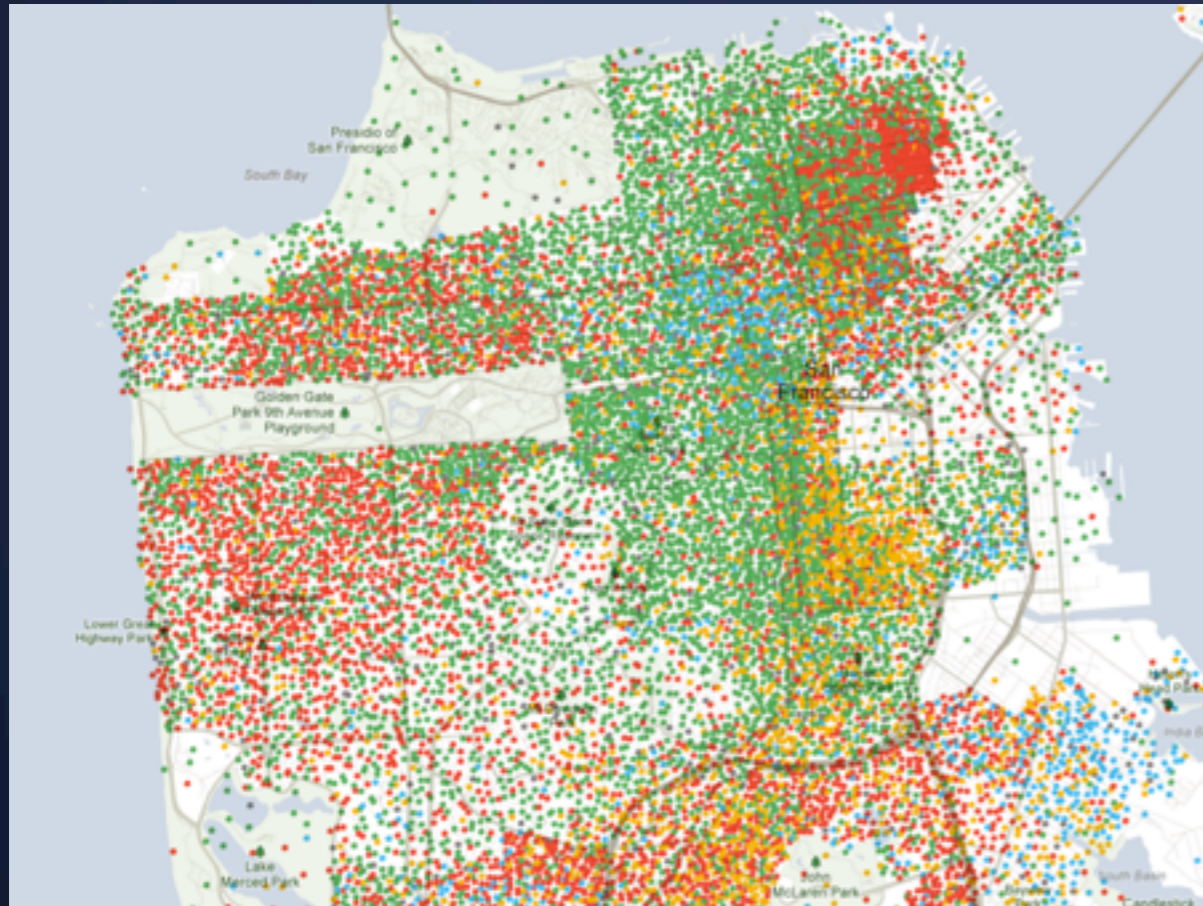
Technique



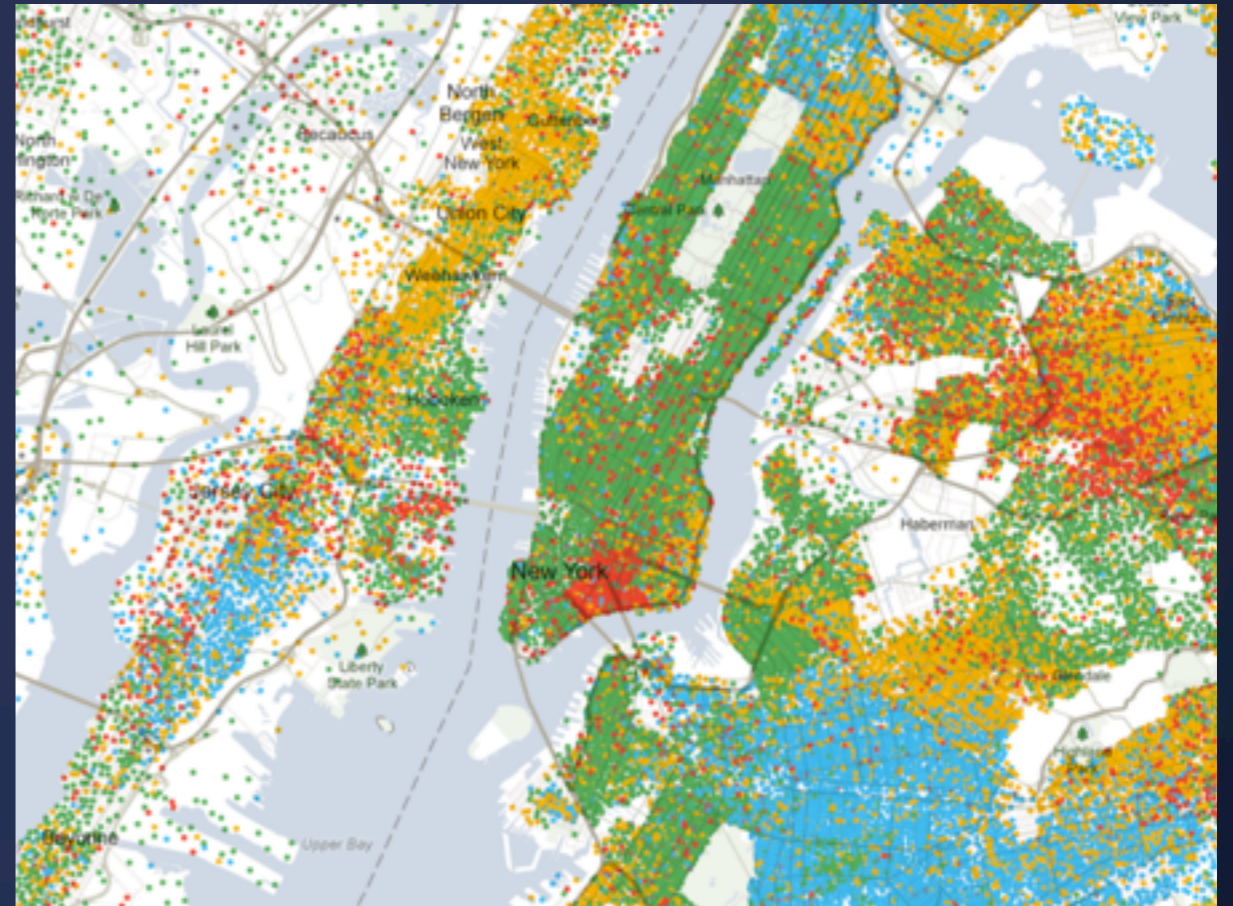
# Example

NY Times: Mapping America

Overcome limitations of display size



San Francisco



New York City

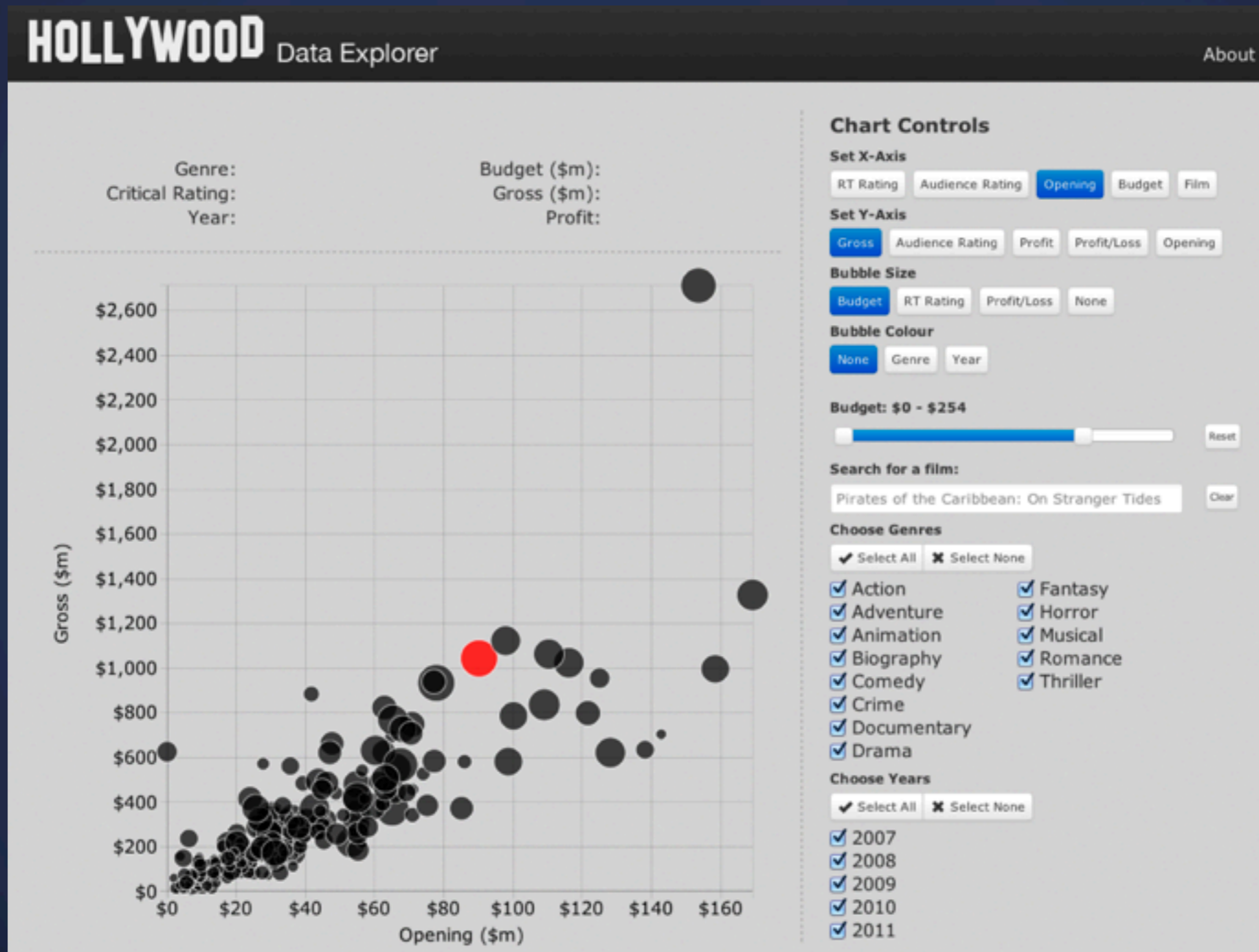


# **3. Reconfigure**

**Show a different arrangement**

# Example

## Hollywood Data Explorer: Changing Axes

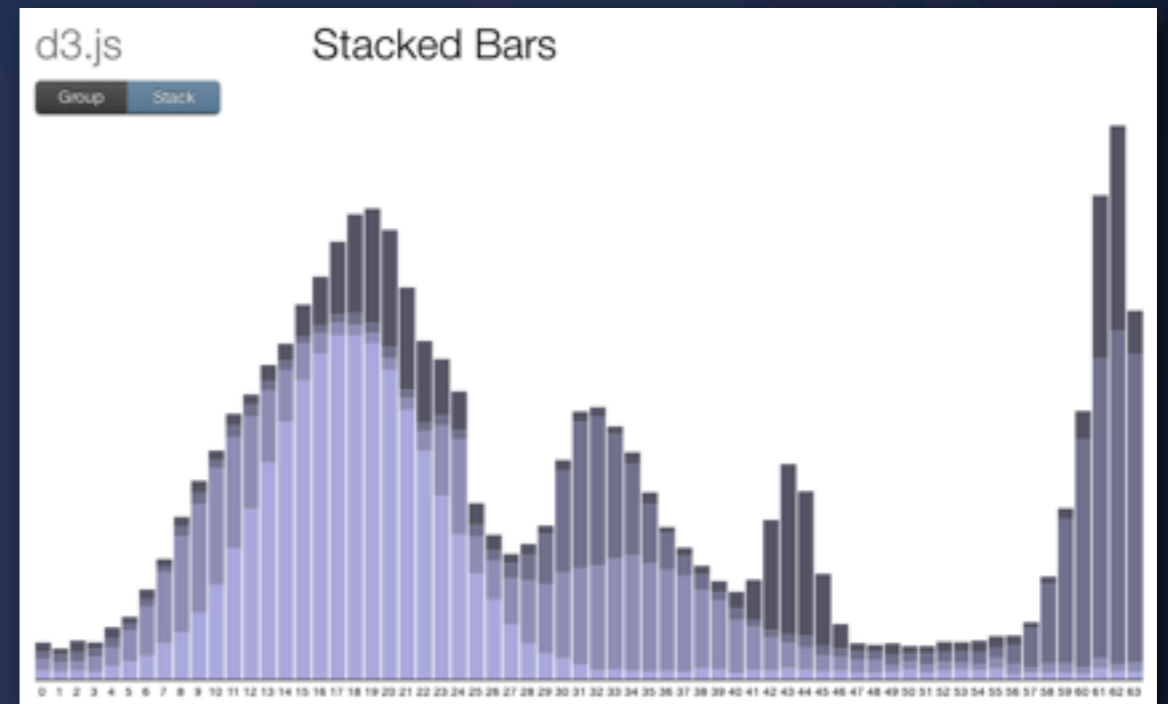
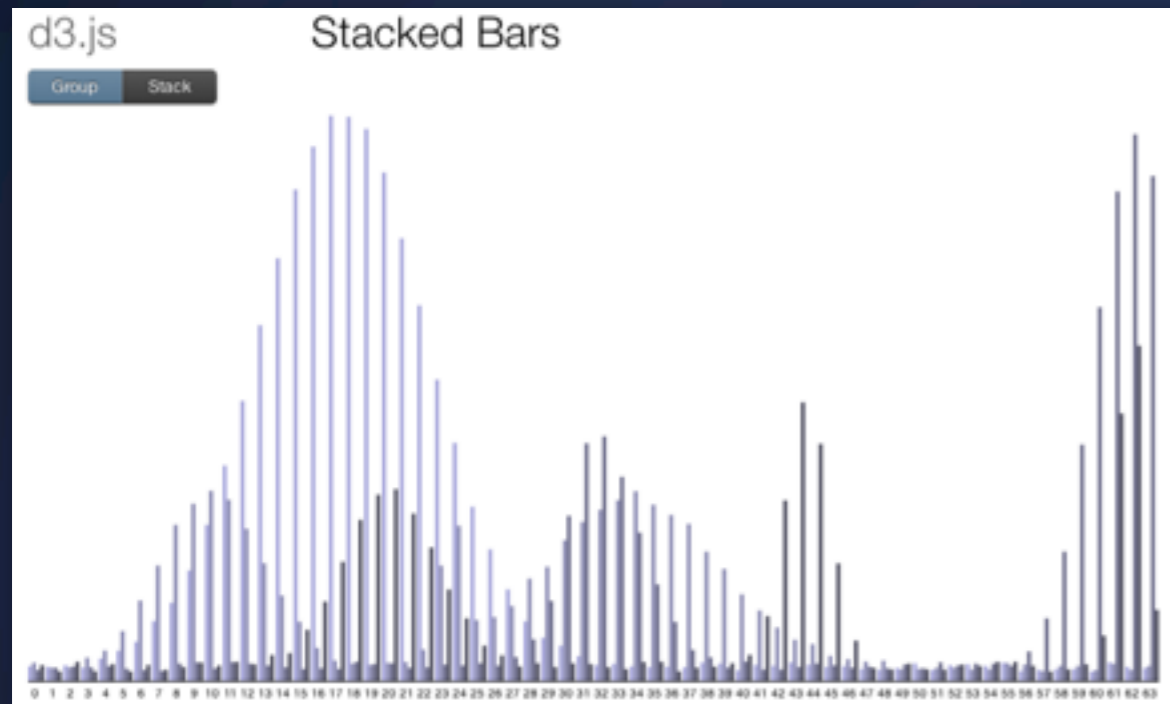


# **4. Encode**

**Show a different representation**

# Example

D3.js stacked / grouped bars



## Change visual/retinal variables

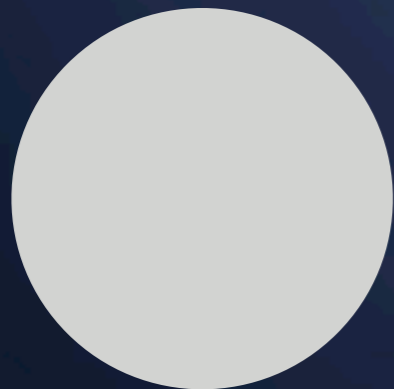
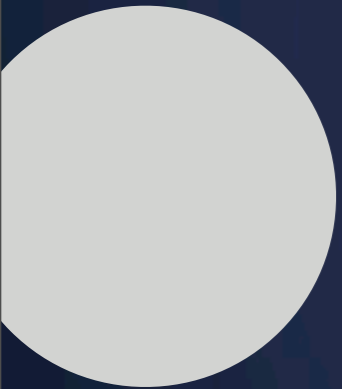
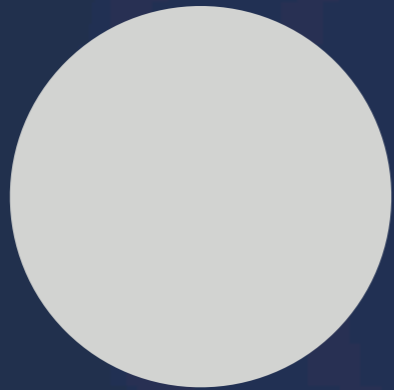
- Colors
- Sizes
- Orientation
- Font
- Shape

# **5. Abstract / Elaborate**

**Show more or less detail**

# 5. Abstract / Elaborate

Special Technique: Focus & Context



# 5. Abstract / Elaborate

Special Technique: Focus & Contect

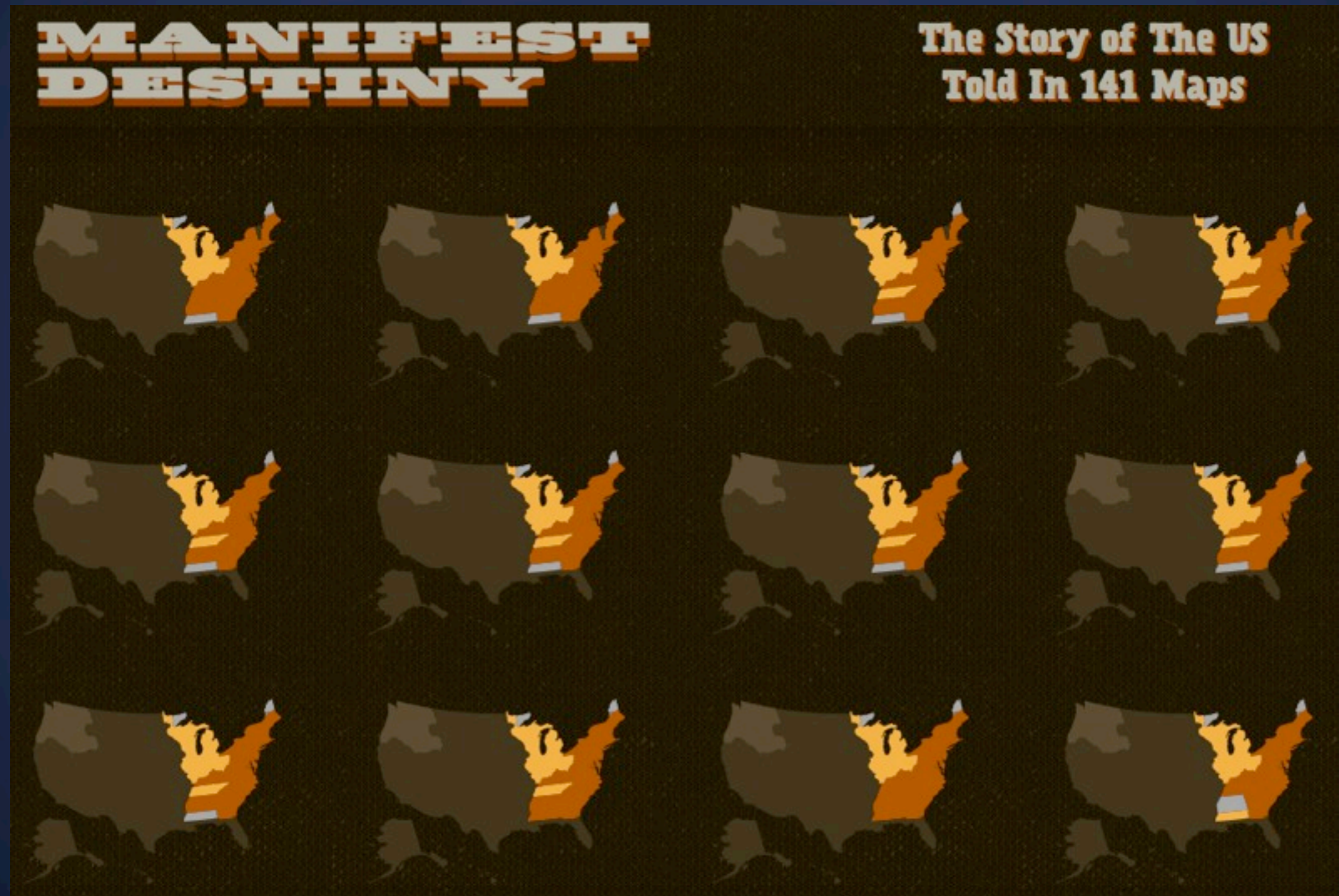


***Rank: 1***

School of Information  
UC Berkeley  
Students: 125

# Example

Manifest Destiny (shameless plug by yours truly)



<http://michaelporath.com/projects/manifest-destiny/>



# **6. Filter**

**Show something conditionally**

# Example

## San Francisco Crimespotting

San Francisco crimespotting

Report data last published by San Francisco Police: 2 days ago

Home Map Crime Reports API About Feedback

TIME OF DAY  
Show All | Hide All  
Light | Dark [nearest hour]  
Commute | Nightlife  
Day | Night | Swing Shift

DATE  
Past Week  
Dec 2010

CRIME TYPE Show All | Hide All

CRIME TYPE	Show All   Hide All
AA Aggravated Assault	<input checked="" type="checkbox"/>
Mu Murder	<input checked="" type="checkbox"/>
Ro Robbery	<input checked="" type="checkbox"/>
SA Simple Assault	<input checked="" type="checkbox"/>
DP Disturbing the Peace	<input checked="" type="checkbox"/>
Na Narcotics	<input checked="" type="checkbox"/>
Al Alcohol	<input checked="" type="checkbox"/>
Pr Prostitution	<input checked="" type="checkbox"/>
Th Theft	<input checked="" type="checkbox"/>
VT Vehicle Theft	<input checked="" type="checkbox"/>
Va Vandalism	<input checked="" type="checkbox"/>
Bu Burglary	<input checked="" type="checkbox"/>
Ar Arson	<input checked="" type="checkbox"/>

Notice anything different?  
We've been working on the interface design, [read more about it on the blog](#).

San Francisco Crimespotting is an interactive map of crimes in San Francisco and a tool for understanding crime in cities.

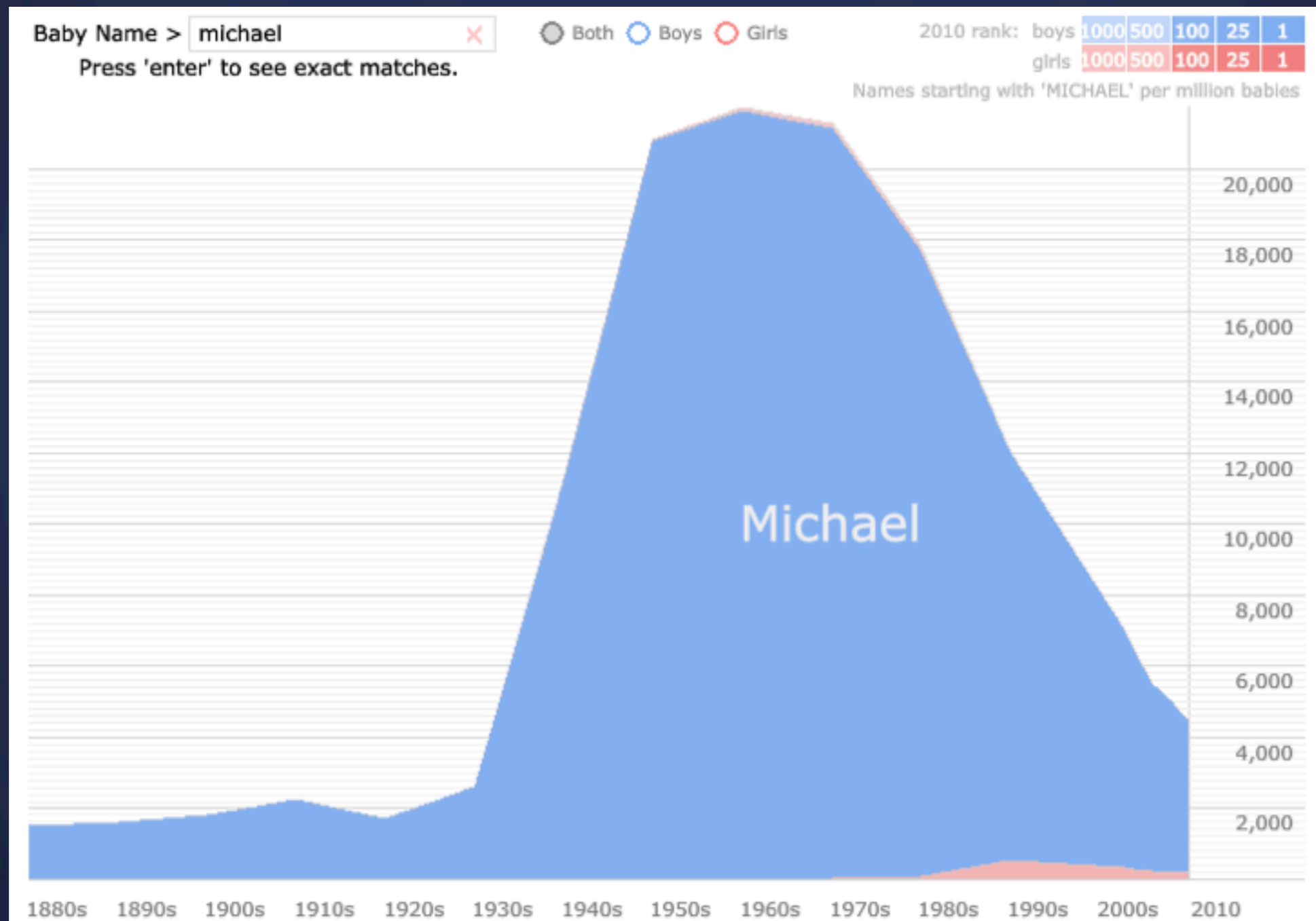
If you hear sirens in your neighborhood, you should know why. Crimespotting makes this possible with interactive maps and [RSS feeds](#) of crimes in areas that you care about.

A note about map symbols  
The names used here are based on [Oakland's](#) categorization of its crime statistics on the [CrimeWatch](#) website. We have additionally grouped them into violent crimes (red), property

Change the set of data items presented based on some condition

# Example

## Keystroke filtering in NameVoyager

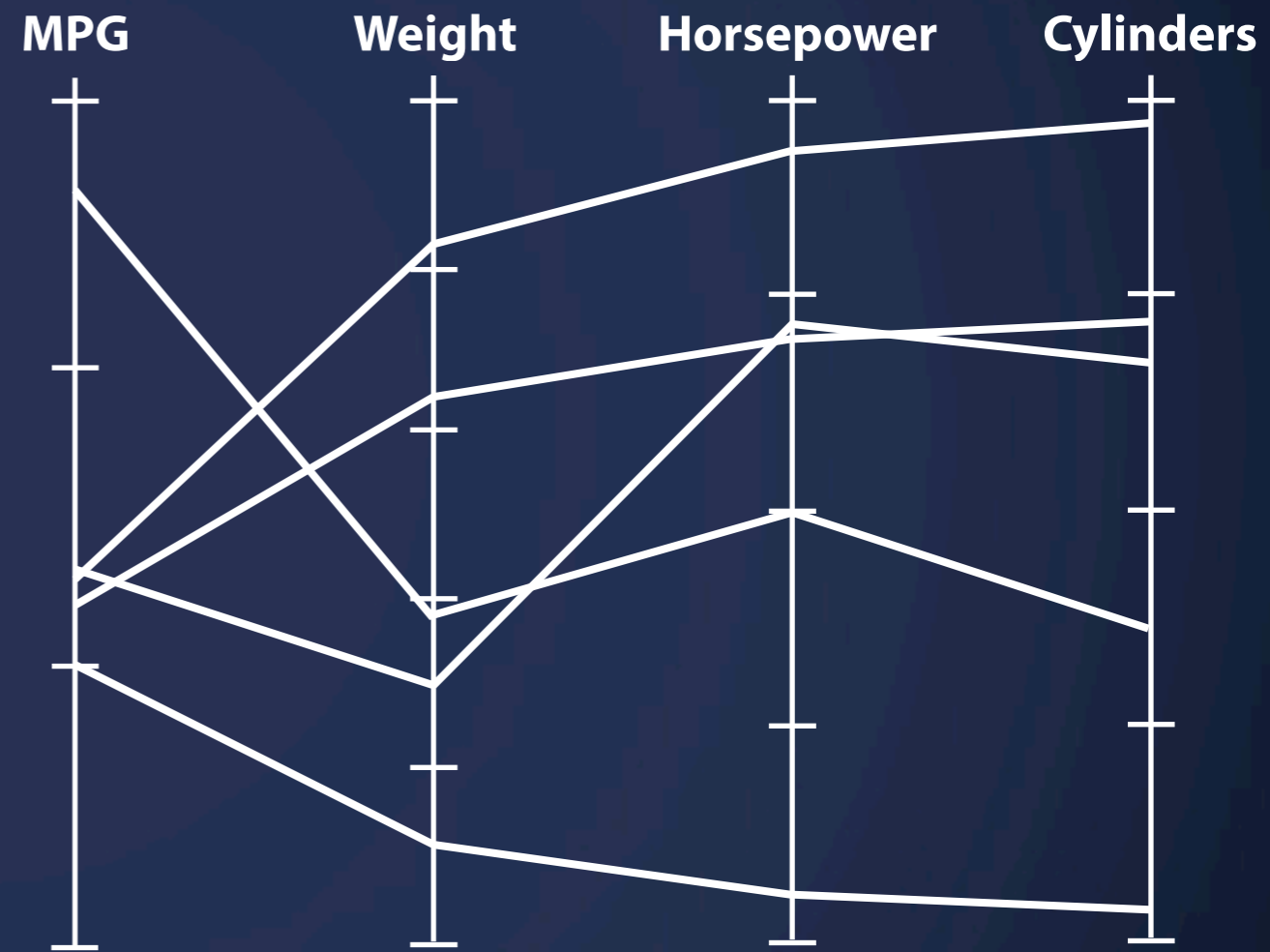
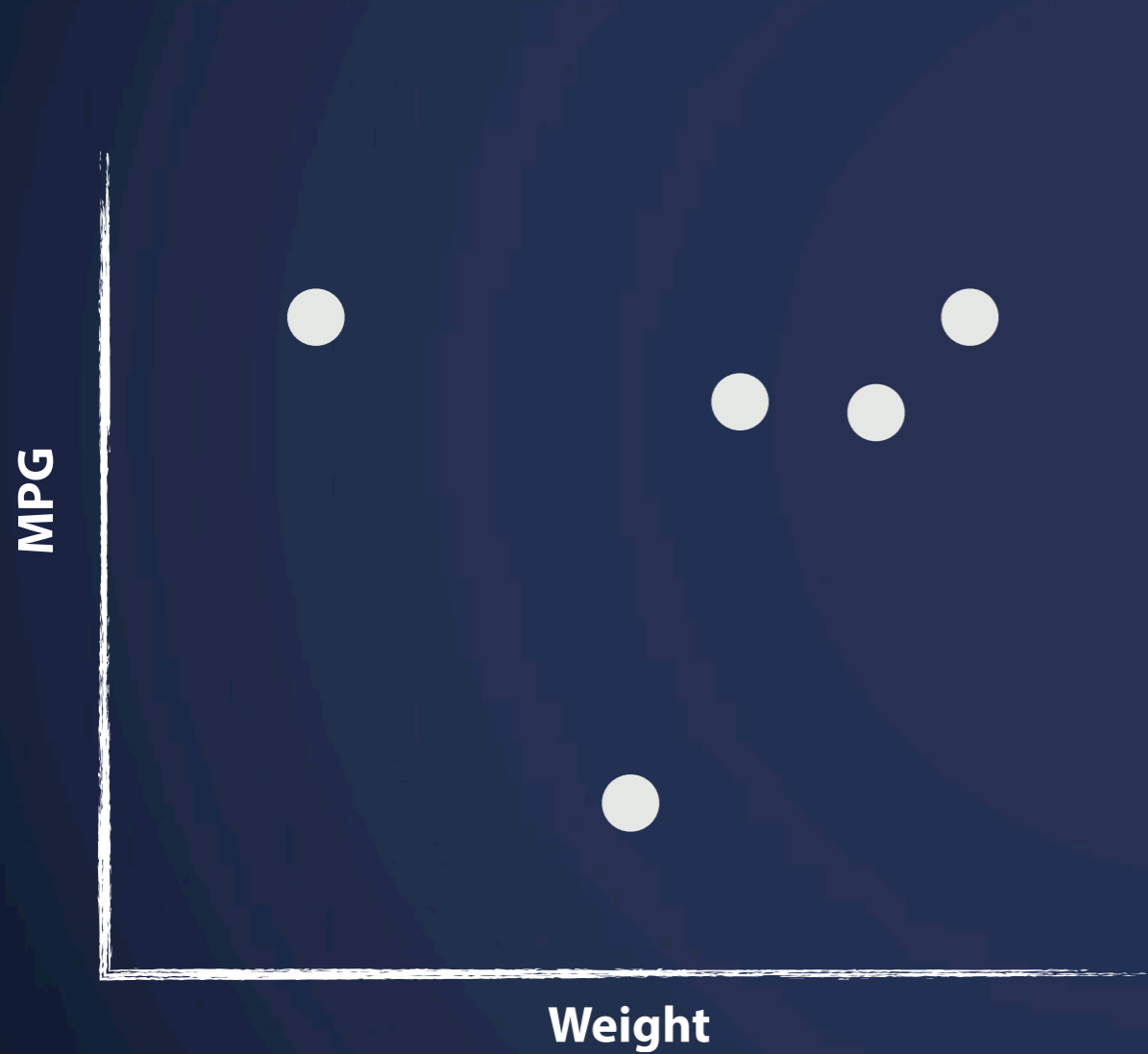


# **7. Connect**

**Show related items**

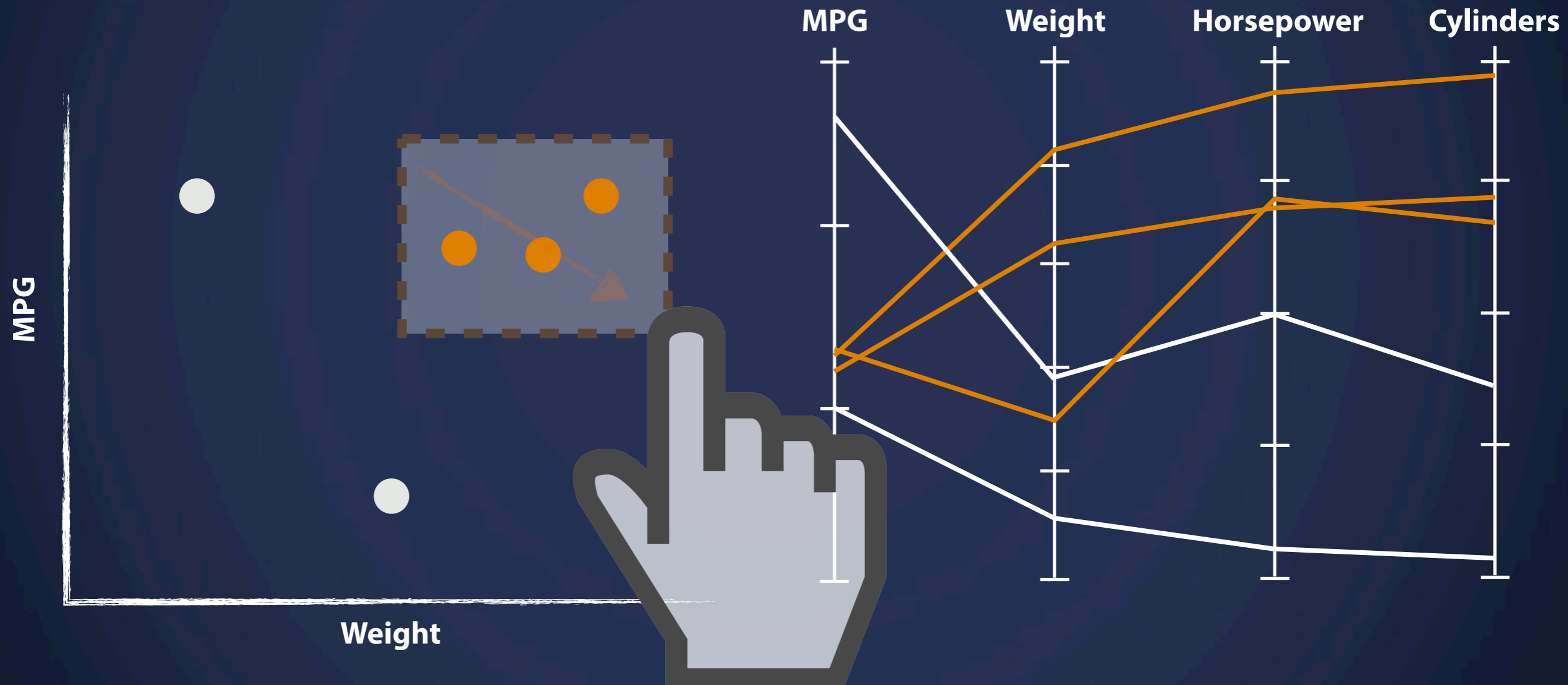
# 7. Connect

Special Technique: Brushing & Linking



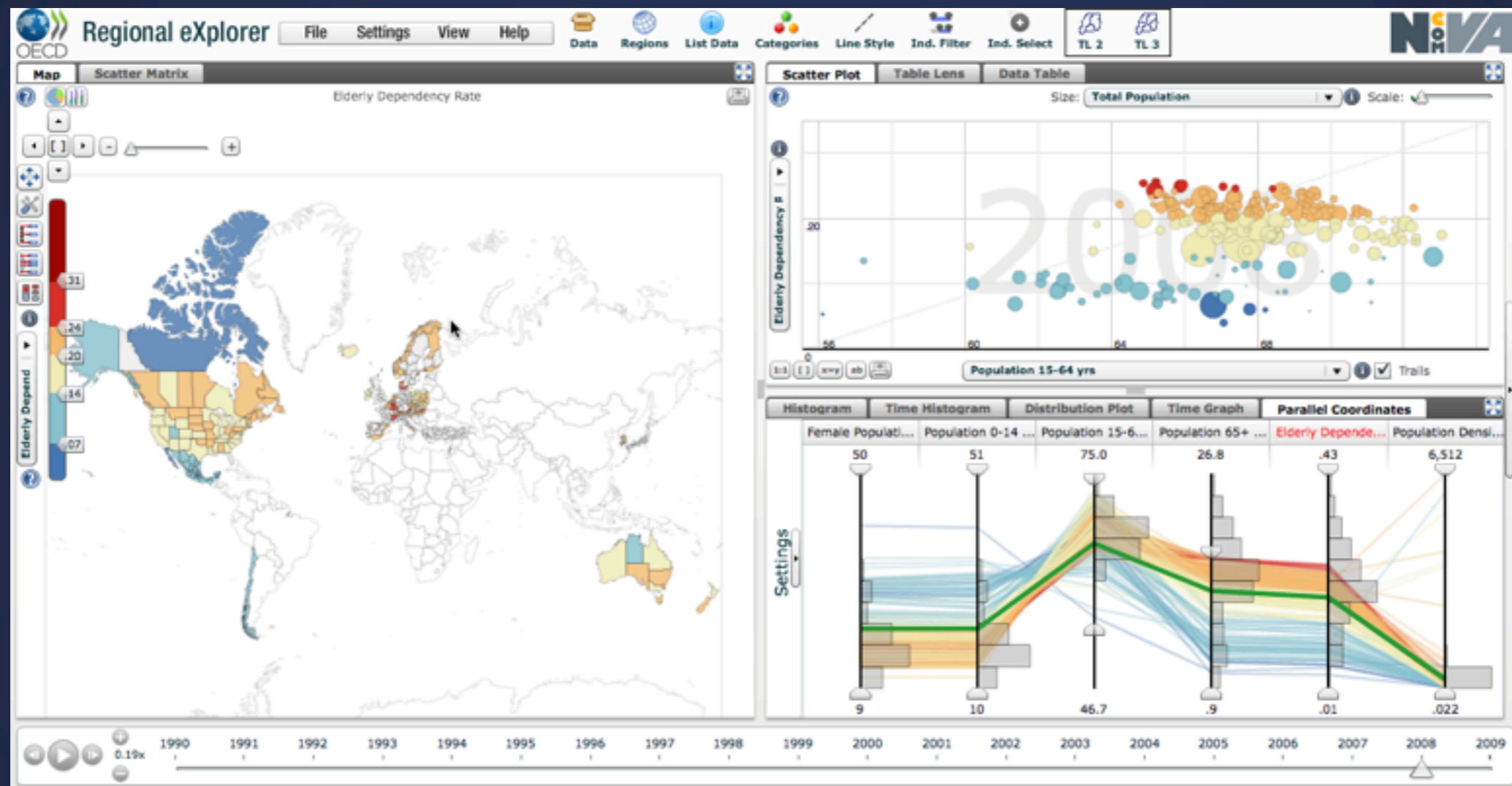
# 7. Connect

Special Technique: Brushing & Linking



# Example

## OECD Regional eXplorer



Multiple views of same data

Selecting or highlighting in one case generates highlighting in another

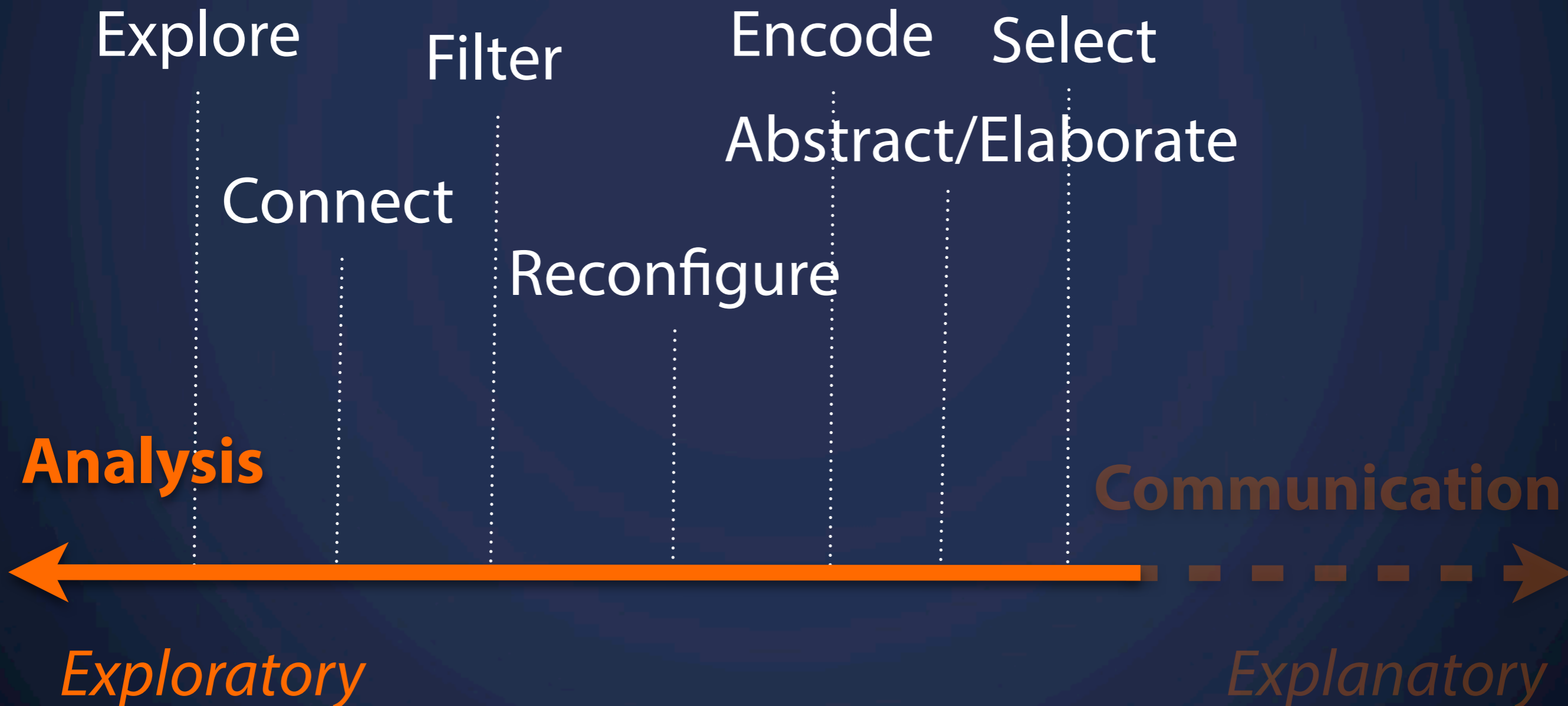
# **Interaction vs Representation**

**Static representation, that is.**



# Analysis – Communication

Interaction has an exploratory aspect



# So you wanna use interaction?



Nail?

# So you wanna use interaction?



Nail?



# So you wanna use interaction?



= **Interaction**

# Many Visualizations out there

Apple has shipped more than 100 million iPhones worldwide up to the end of 2015. Despite the hype, Samsung's Galaxy S6 Edge has been shipped in more than 100 million units in the same time.



## Apple iPhone 6S and 6S Plus

## Samsung Galaxy S6 Edge



Apple iPhone 6S and 6S Plus have been shipped more than 100 million units worldwide up to the end of 2015. Samsung Galaxy S6 Edge has been shipped in more than 100 million units in the same time.



Apple iPhone 6S and 6S Plus have been shipped more than 100 million units worldwide up to the end of 2015. Samsung Galaxy S6 Edge has been shipped in more than 100 million units in the same time.

# Many Visualizations out there

**Now with 4x more interaction!**



# The Process

**What  
Data?**

Field of  
Interest

**Find a  
story**

Data  
Exploration

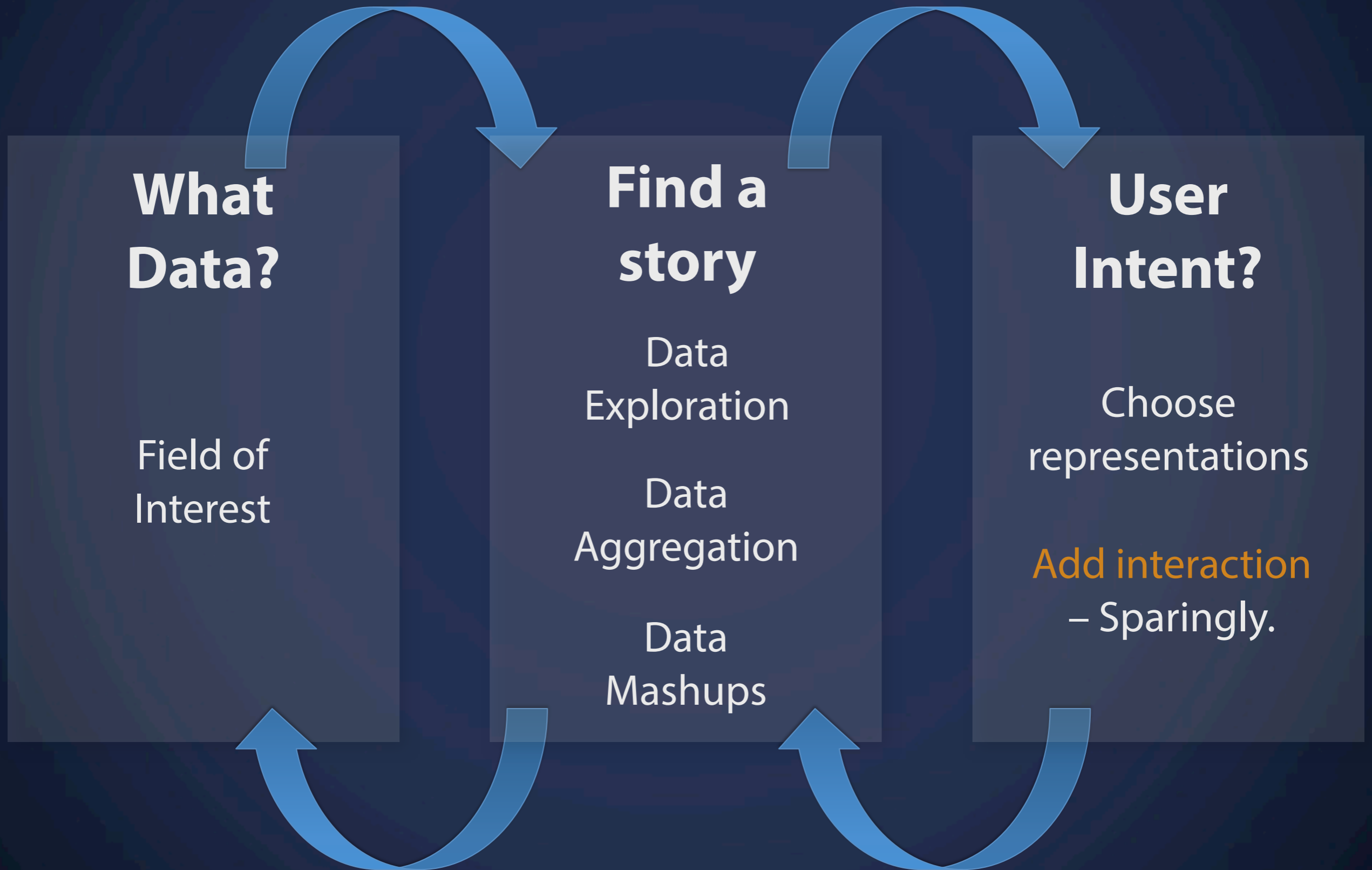
Data  
Aggregation

Data  
Mashups

**User  
Intent?**

Choose  
representations

**Add interaction**  
– Sparingly.



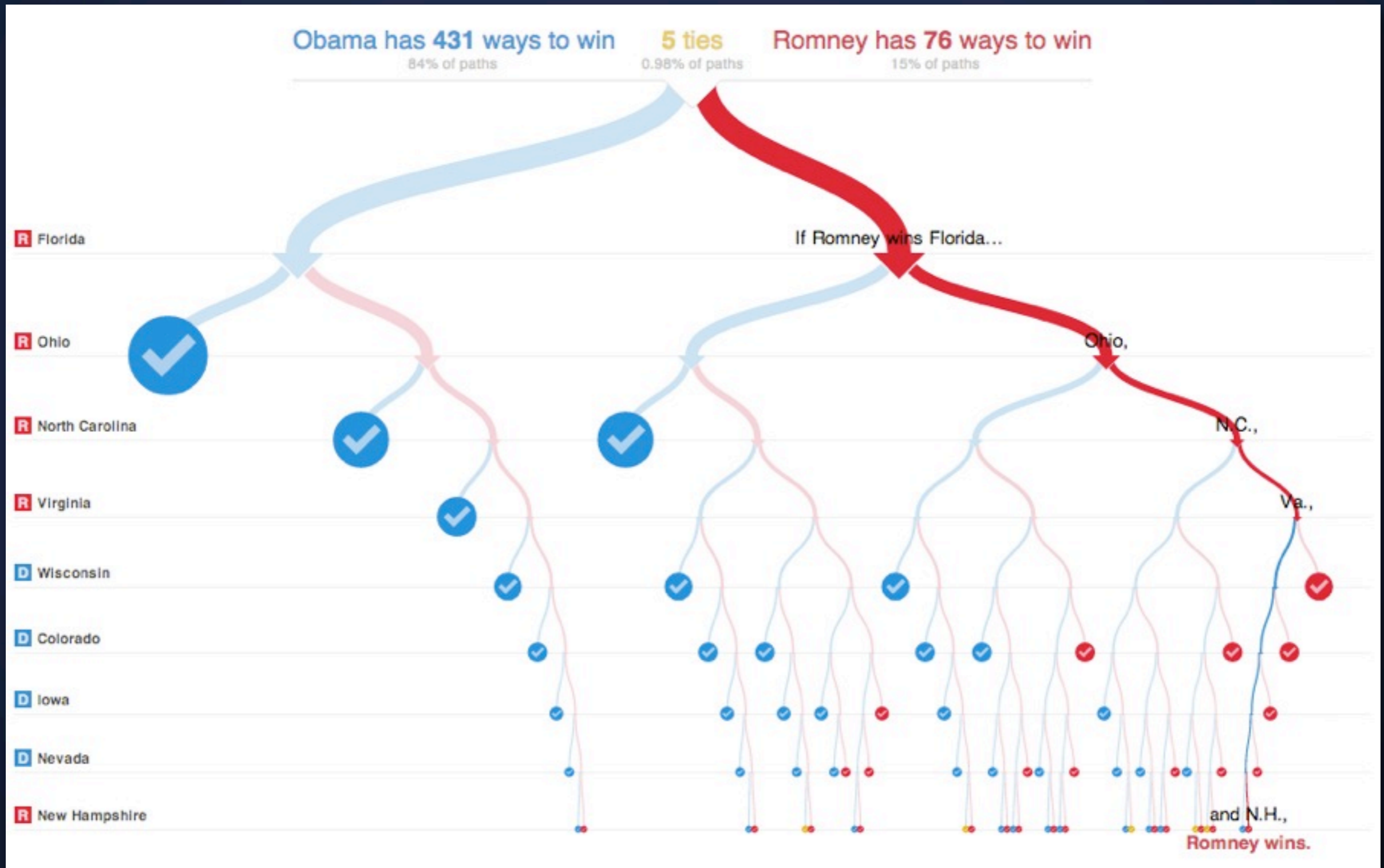
# Examples

**What's the user intent? Which technique?**



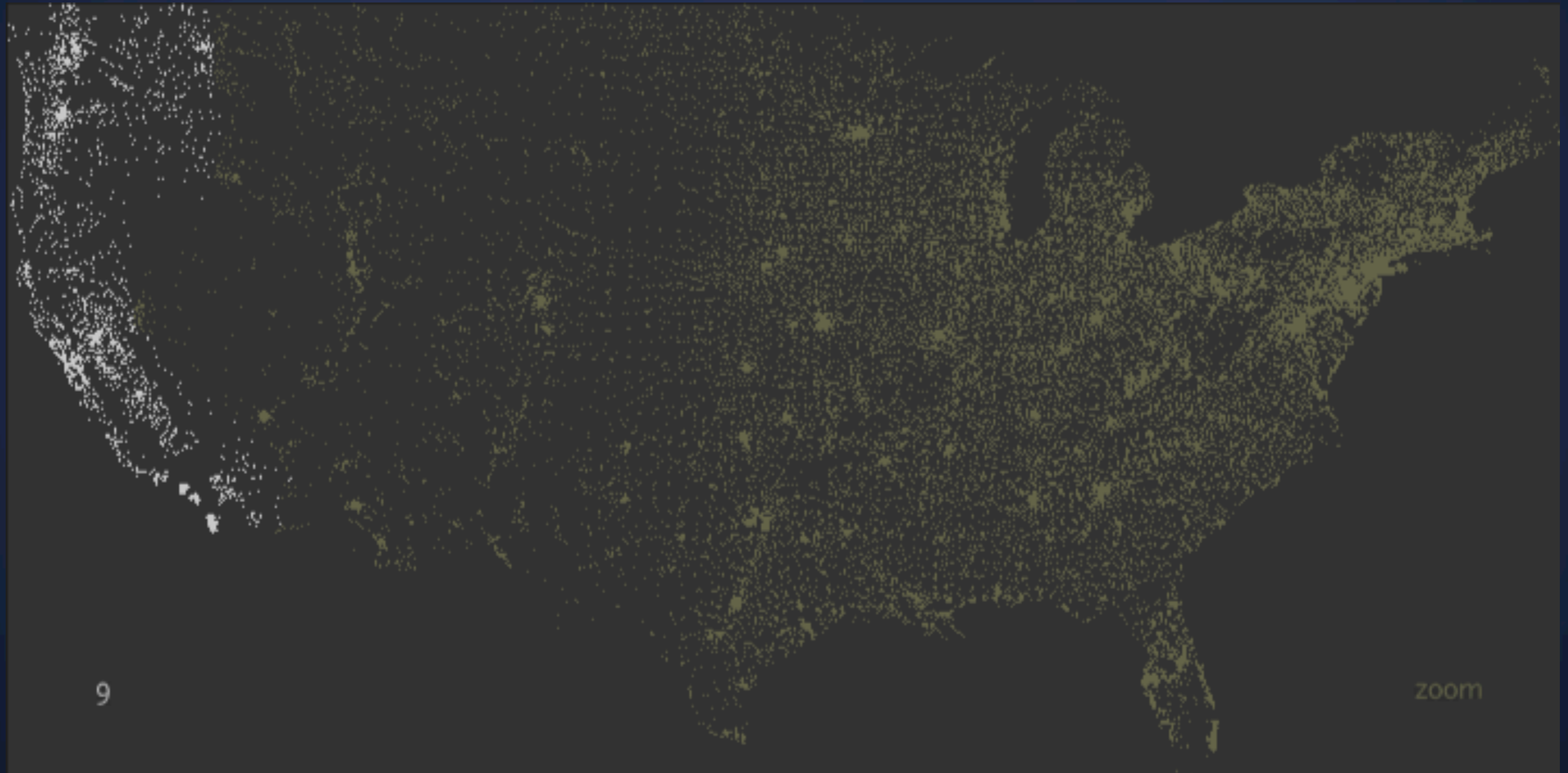
# 512 Paths To The White House

NY Times



# Example

Keystroke filtering in ZipDecode



# Bloomberg Billionaires

Bloomberg Visual Data

Today's ranking of the world's richest people

Explore Rank Plot Map

all billionaires all industries all citizenships all genders all ages all sources of wealth

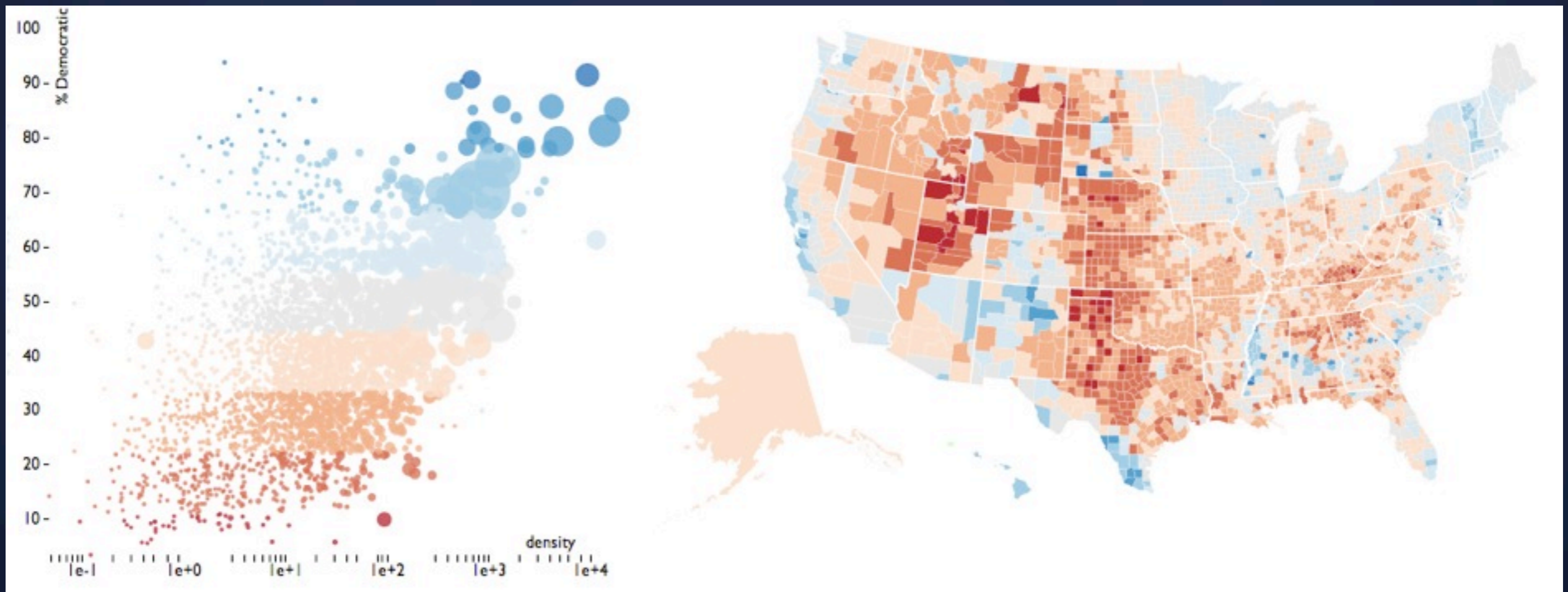
net worth (rankings) as of March 4, 2013

Total wealth of all billionaires: \$2T



1 day

# Scatter States



<http://hyperphor.com/election/scatterstates.html>

# Recap

# Announcement

Assignment 4

**Task** Construct a **narrative** about yourself, telling from the data you've collected

**Deliverable** Sketches/Iteration, Final Visualization and Writeup

**Due** Tuesday Mar 19, 3:00PM

More information on the class blog

# Lab Thursday

D3.js; Part II

# **Next Lecture**

**Storytelling**