



# Data Driven Documents

A JavaScript DOM manipulation library

Developed by Mike Bostock

<https://d3js.org/>

one of the overall most popular projects on GitHub!

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2301

## D<sup>3</sup>: Data-Driven Documents

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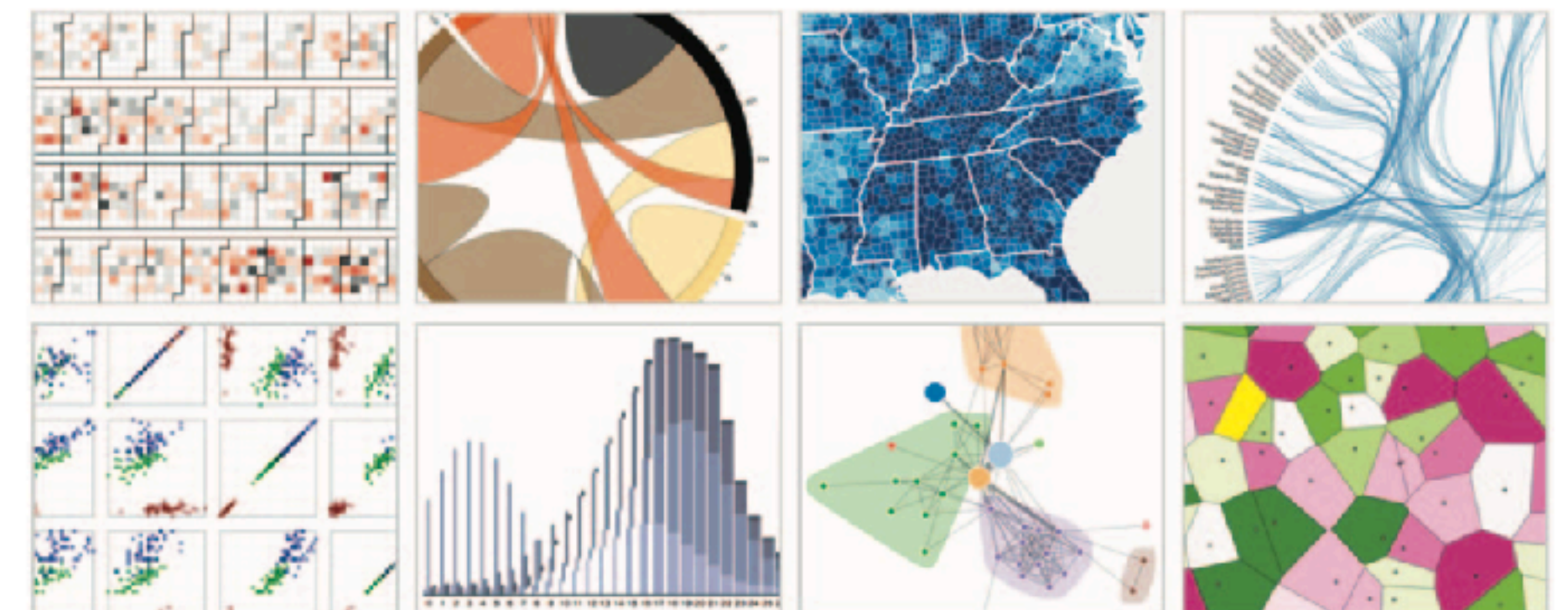


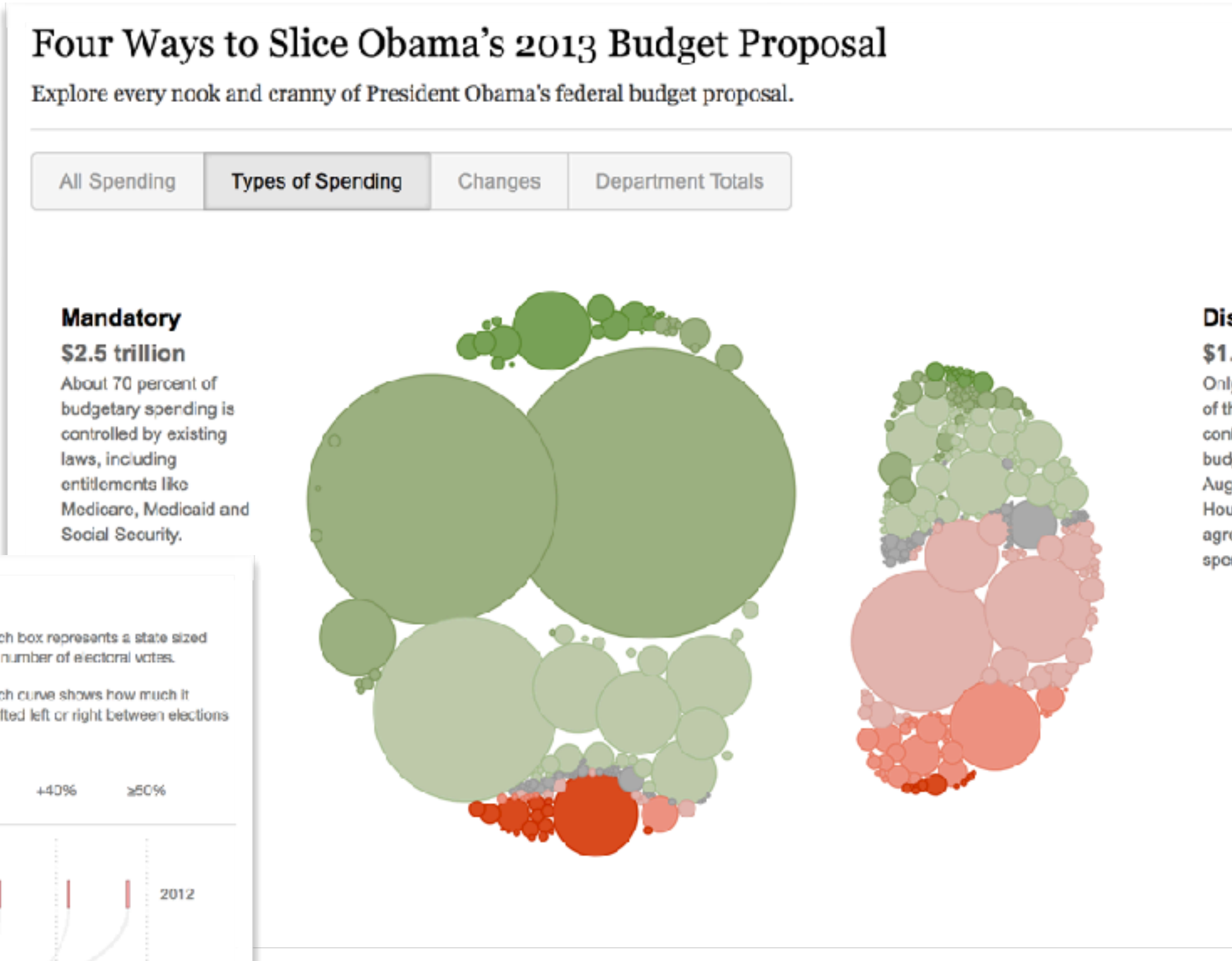
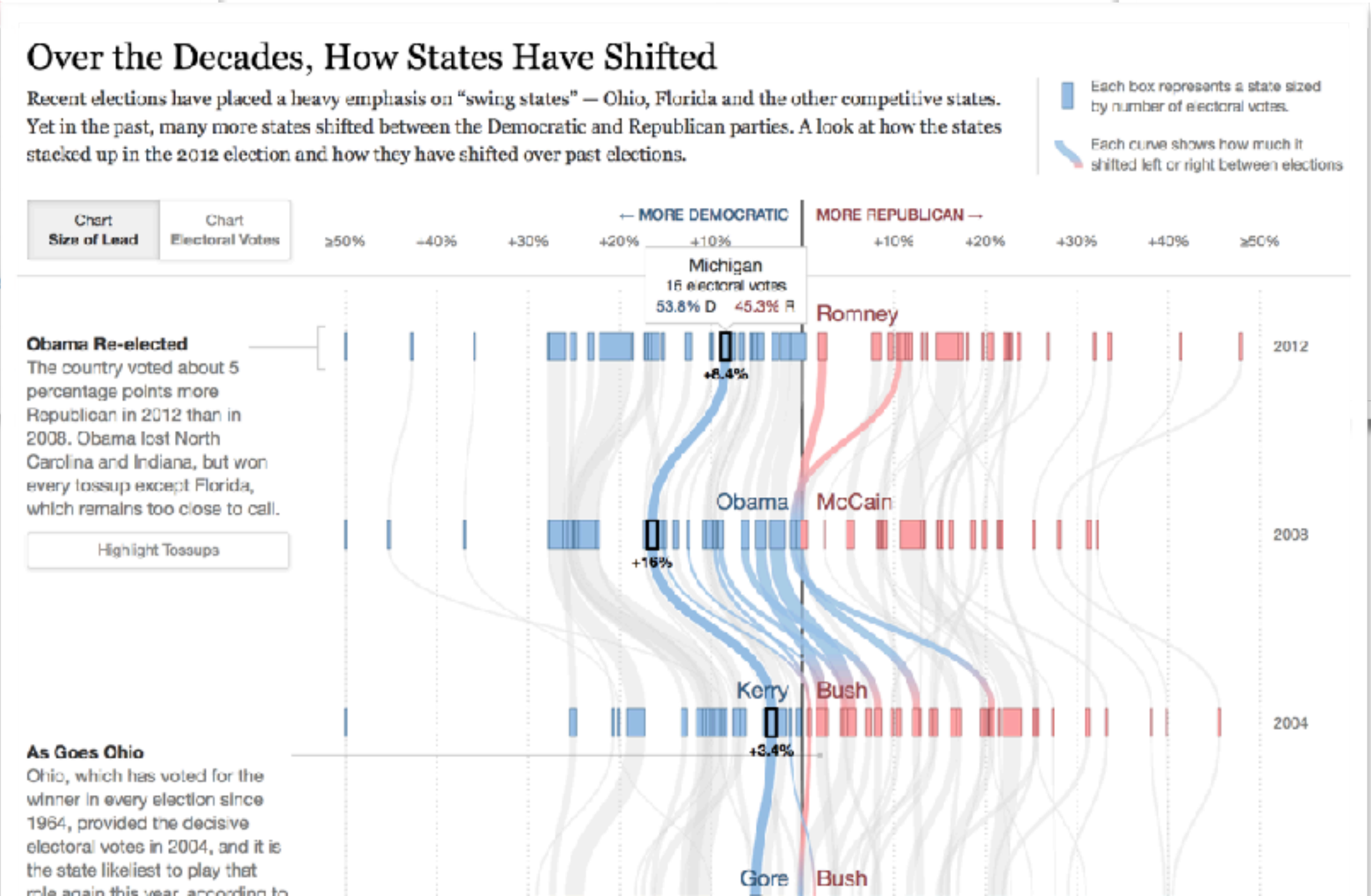
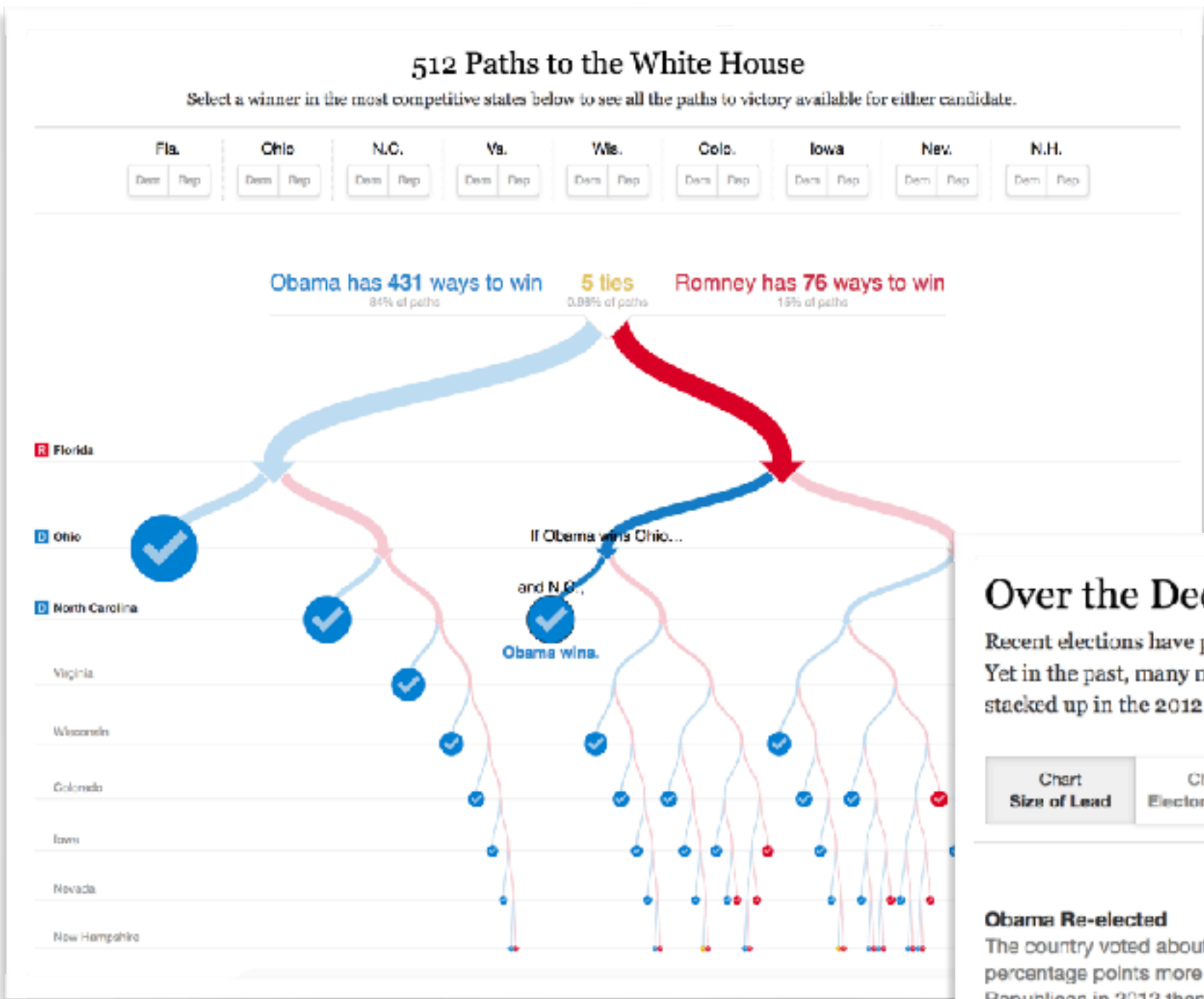
Fig. 1. Interactive visualizations built with D3, running inside Google Chrome. From left to right: calendar view, chord diagram, choropleth map, hierarchical edge bundling, scatterplot matrix, grouped & stacked bars, force-directed graph clusters, Voronoi tessellation.

**Abstract**—Data-Driven Documents (D3) is a novel representation-transparent approach to visualization for the web. Rather than hide the underlying scenegraph within a toolkit-specific abstraction, D3 enables direct inspection and manipulation of a native representation: the standard *document object model* (DOM). With D3, designers selectively bind input data to arbitrary document elements, applying dynamic transforms to both generate and modify content. We show how representational transparency improves expressiveness and better integrates with developer tools than prior approaches, while offering comparable notational efficiency and retaining powerful declarative components. Immediate evaluation of operators further simplifies debugging and allows iterative development. Additionally, we demonstrate how D3 transforms naturally enable animation and interaction with dramatic performance improvements over intermediate representations.

**Index Terms**—Information visualization, user interfaces, toolkits, 2D graphics.



# Widely used for Data Vis



# Scalable Vector Graphics (SVG)

D3 works well together with SVG

Refresher: <http://dataviscourse.net/2016/lectures/lecture-html/>

SVG is used to define vector-based graphics for the Web

SVG defines the graphics in XML format

SVG graphics do NOT lose any quality if they are zoomed or resized

Every element and every attribute in SVG files can be animated

```
1 <!DOCTYPE html>
2 <html lang="en">
3 <head>
4     <meta charset="UTF-8">
5     <title></title>
6 </head>
7 <body>
8 <svg width="400" height="200">
9     <rect x="50" y="50" width="200" height="100"
10         style="fill:red; stroke:black; stroke-wi
11 </svg>
12 </body>
13 </html>
```





# Key D3 Concepts

Selections

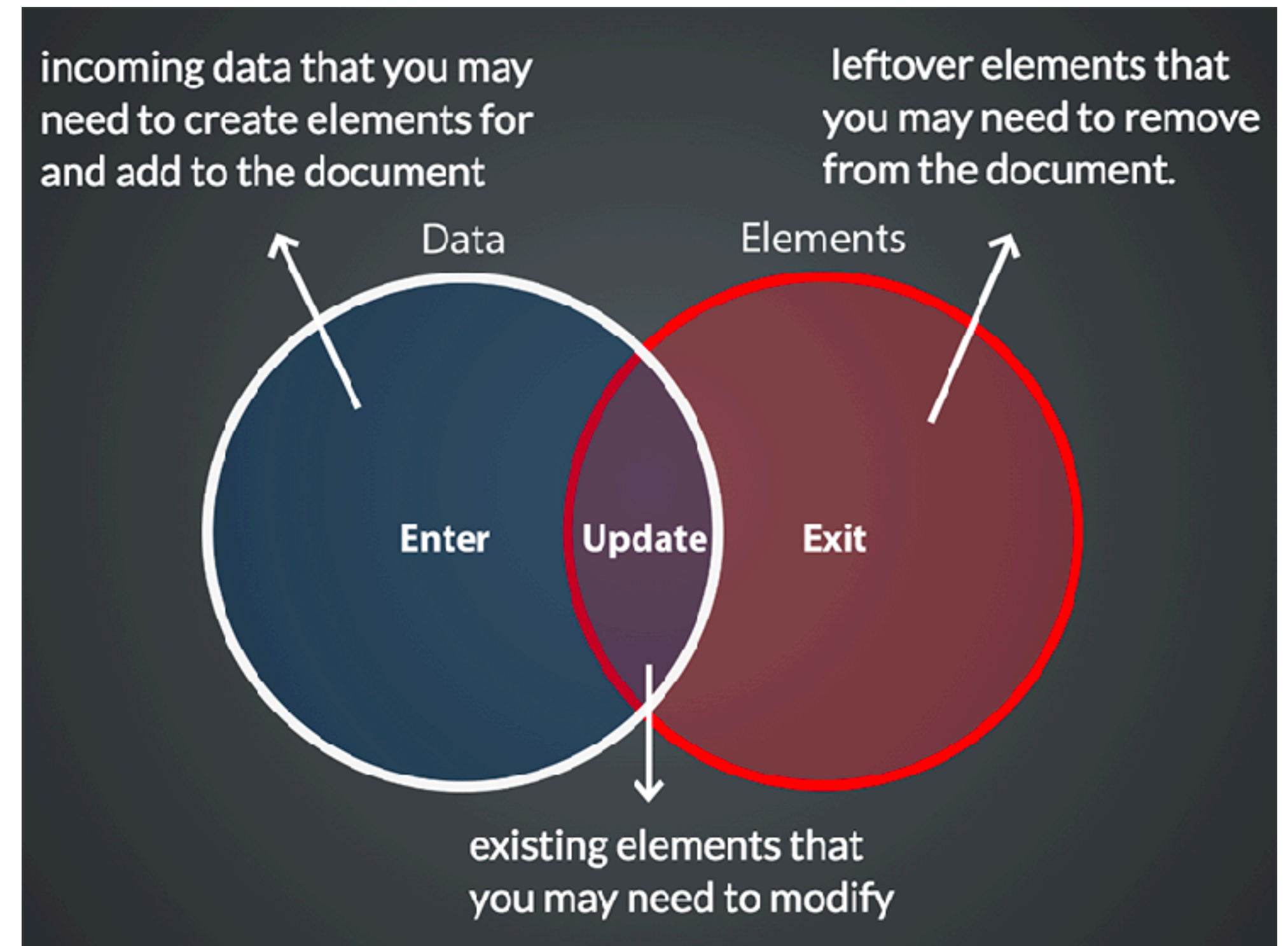
Data Binding

Scales

Axes

Layouts

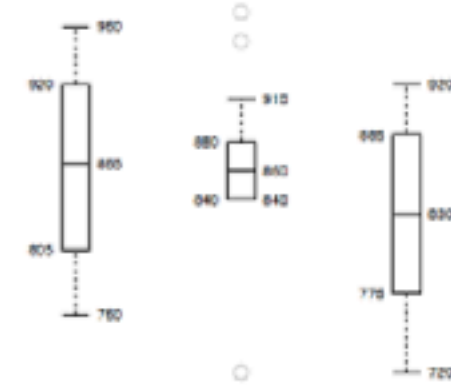
Maps



# D3 Gallery

## Visual Index

Box Plots



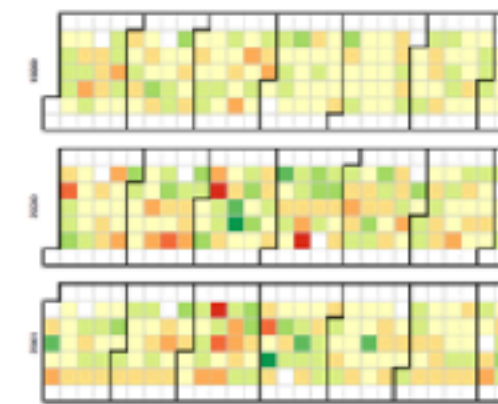
Bubble Chart



Bullet Charts



Calendar View



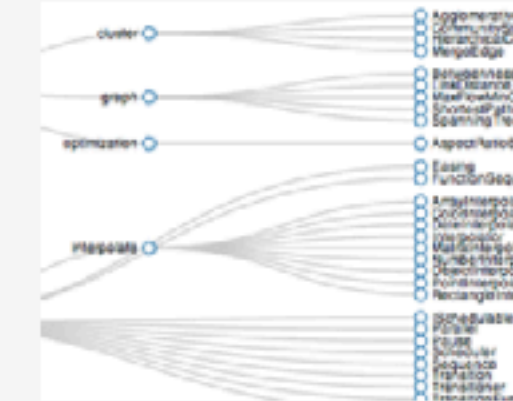
Non-contiguous  
Cartogram



Chord Diagram



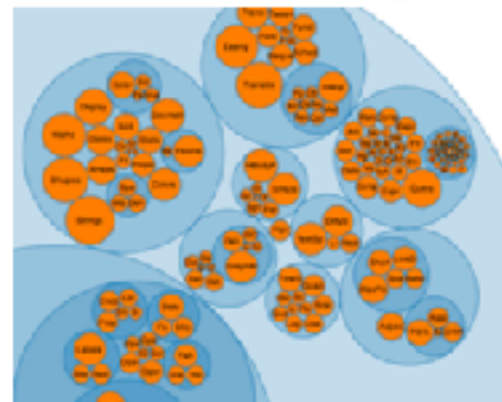
Dendrogram



Force-Directed  
Graph



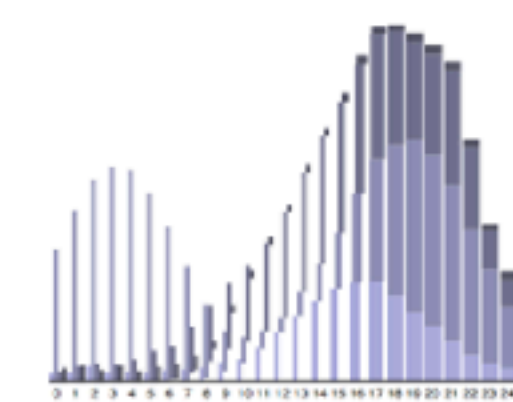
Circle Packing



Population  
Pyramid  
2000



Stacked Bars



Streamgraph



# Tutorials

<http://dataviscourse.net/tutorials/>

SVG Exercise: <https://jsbin.com/yuzomev/edit?html,js,output>

D3 Exercise: <https://jsbin.com/yuzomev/edit?html,js,output>

D3 Exercise Solution: <https://jsbin.com/wimonaxewa/edit?html,css,js,output>