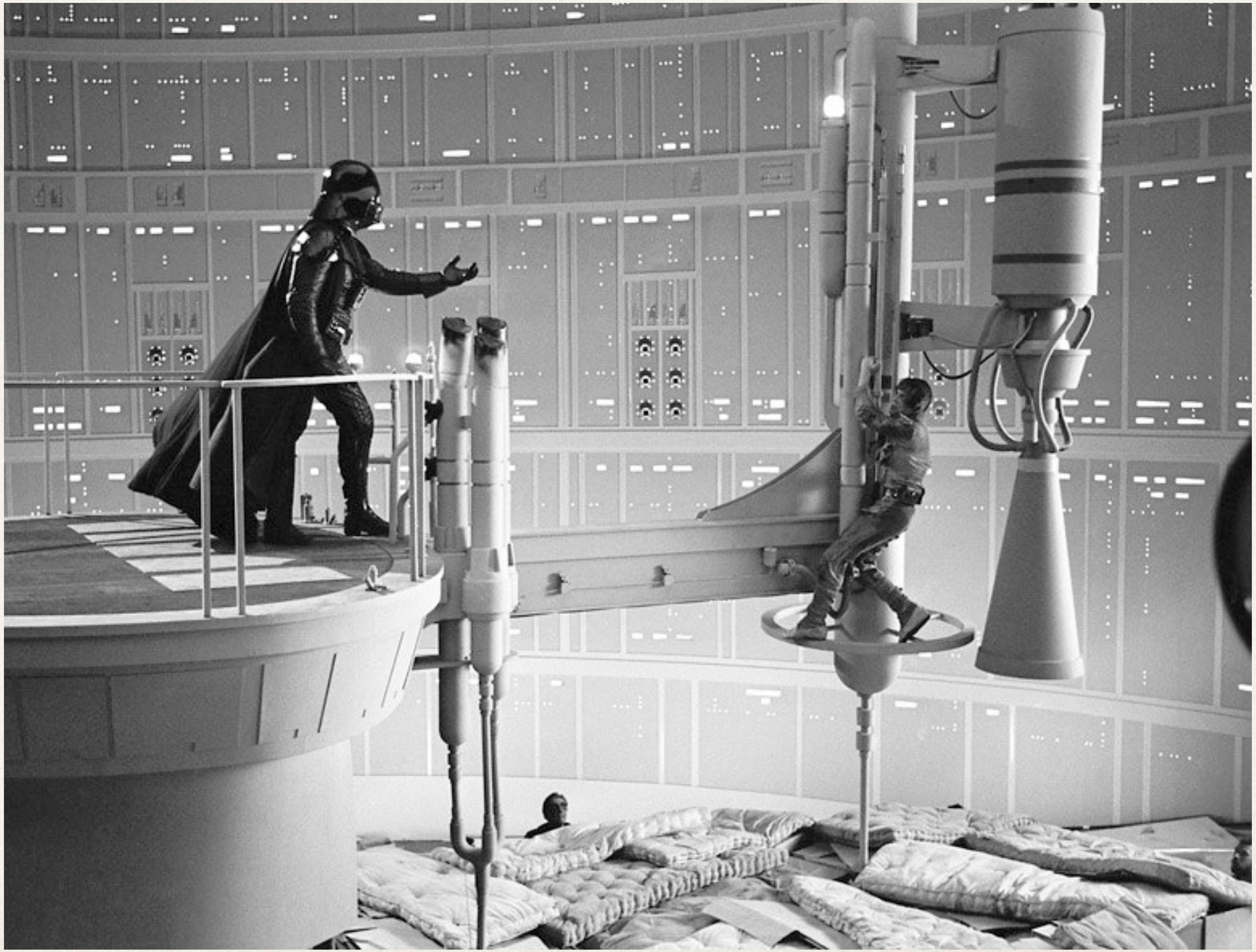
Overview

C. Andrews

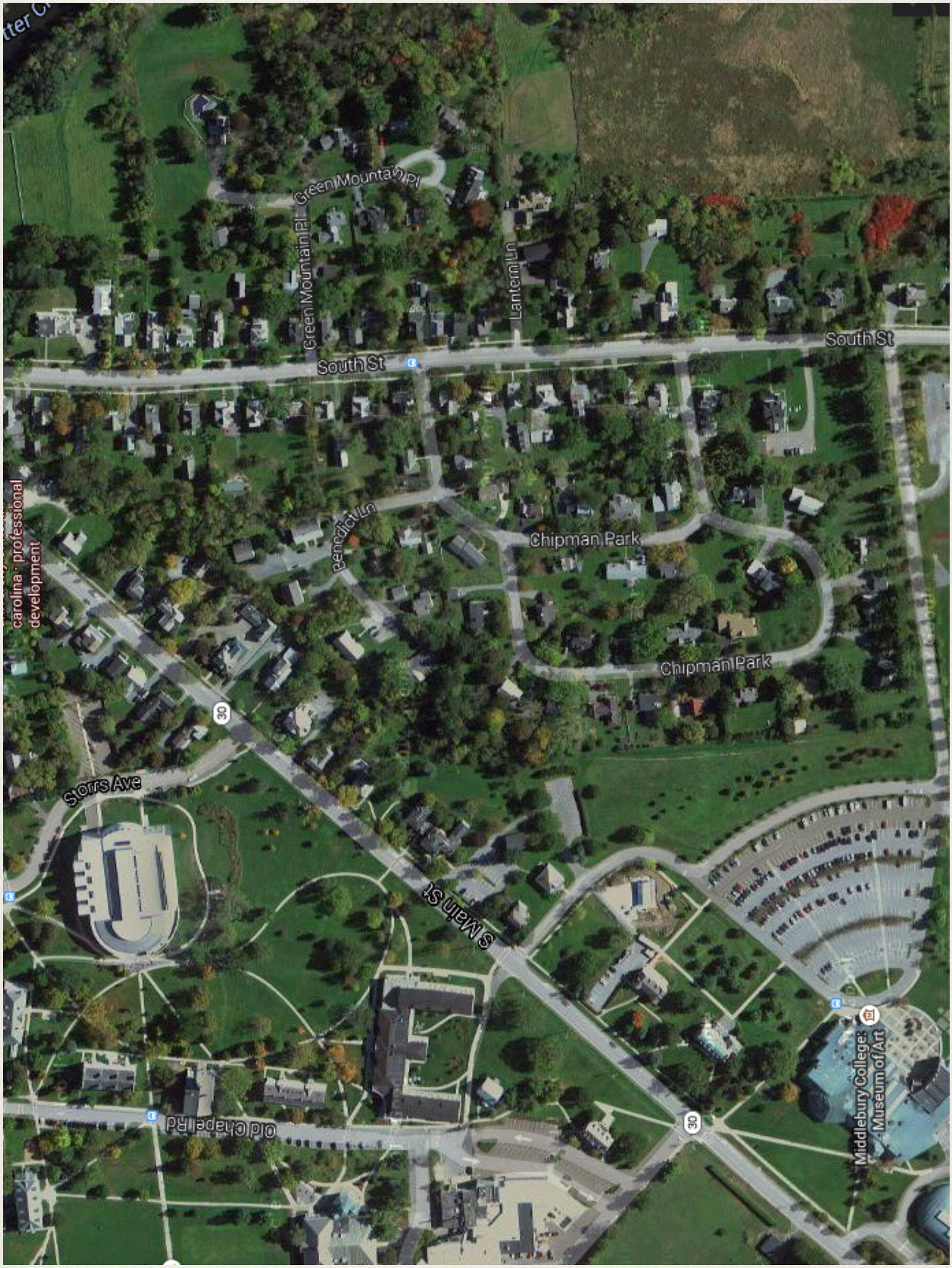
2016-03-18

The keyhole problem

The keyhole problem



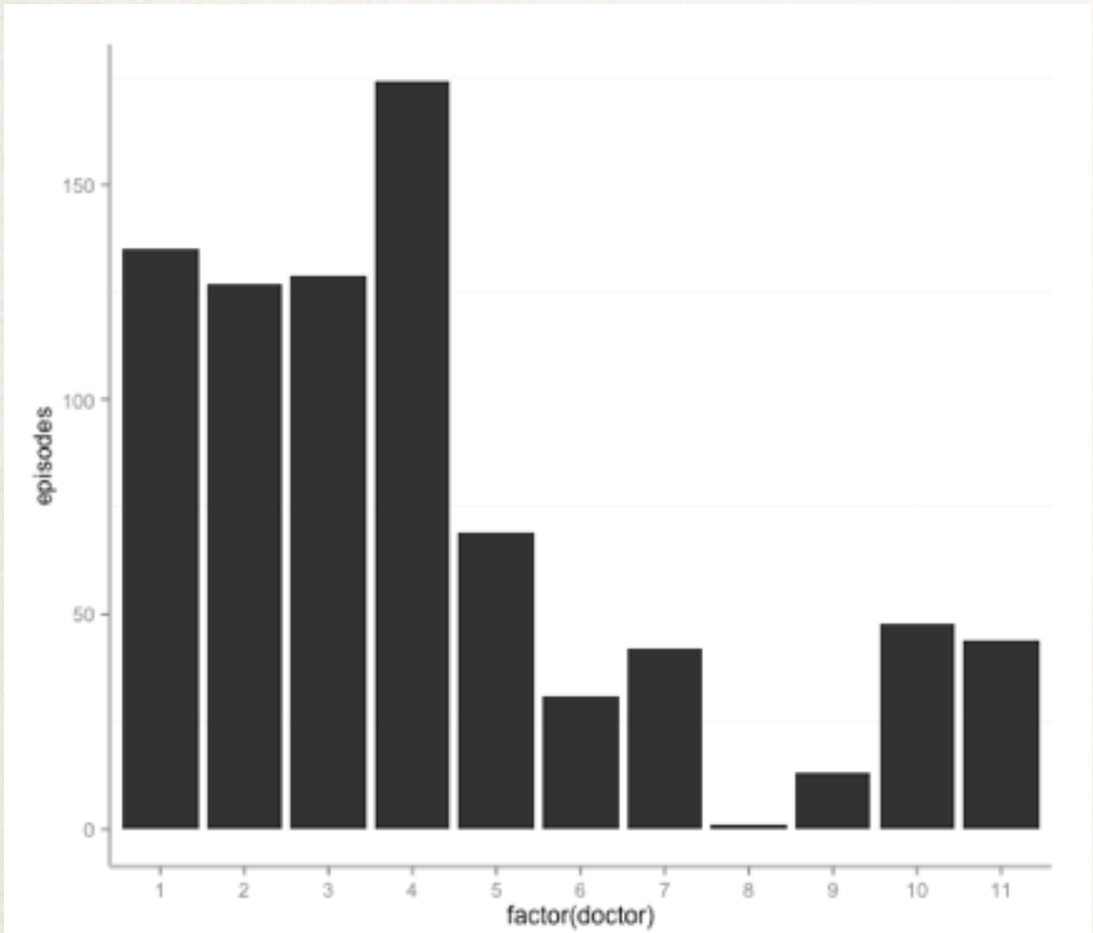
The keyhole problem


Green Mountain Pl
Green Mountain Pl
Lantern Ln
South St
South St
Benedict Ln
Chipman Park
Chipman Park
Storrs Ave
S Main St
Old Chapel Rd
Middlebury College: Museum of Art
30
30

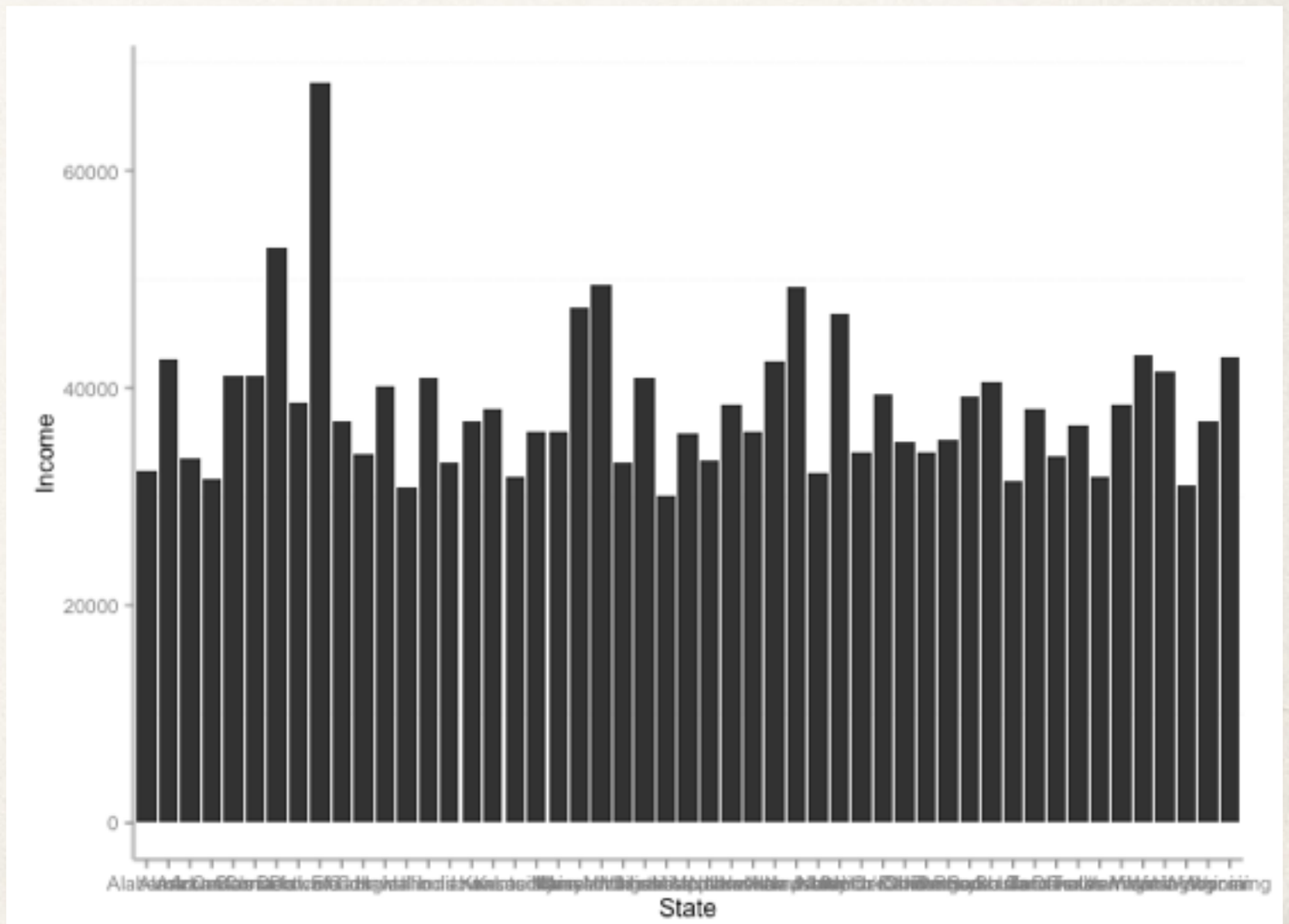
Schneiderman's Mantra

Overview first,
zoom and filter,
details on demand

Data scalability

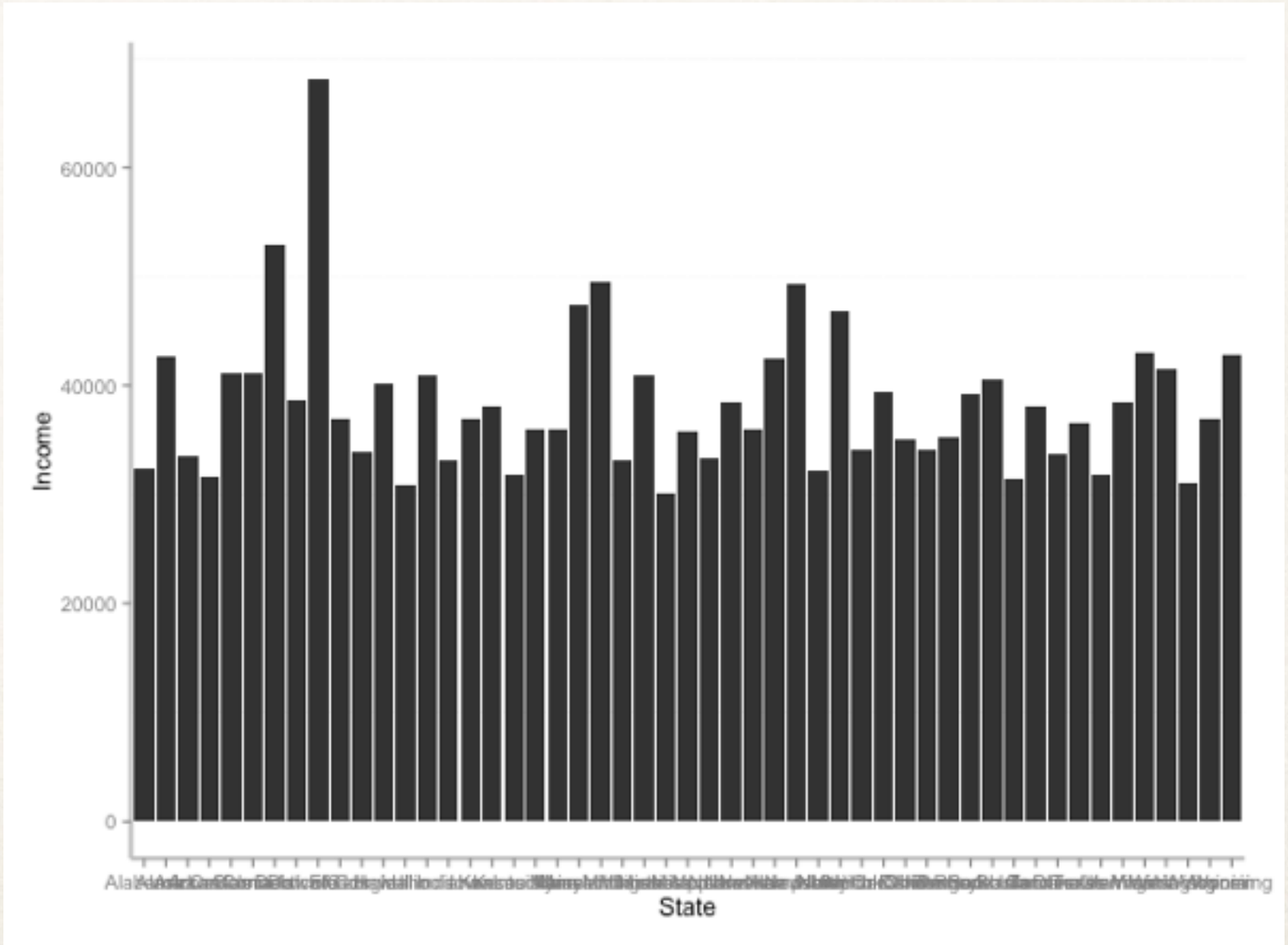


There is always more data



Solution 1: pixel space

Keep squishing those representations



Solution 1: pixel space


File Statistics View Options Help
file1.c
file2.c
file3.c
file4.c
file7.c
file8.c
file9.c
file10.c
file11.c
file12.c
file14.c
file15.c
file16.c
file17.c
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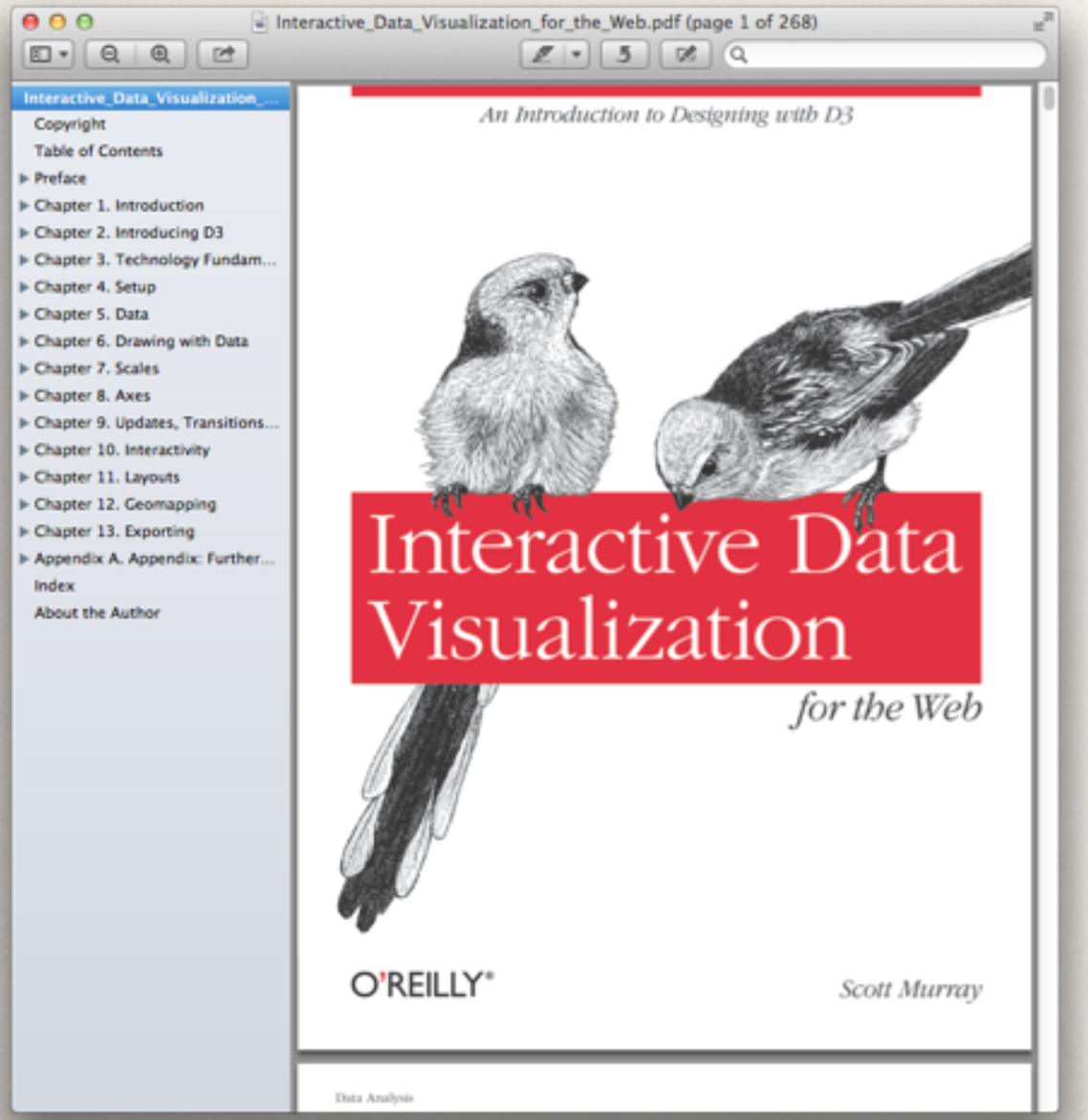
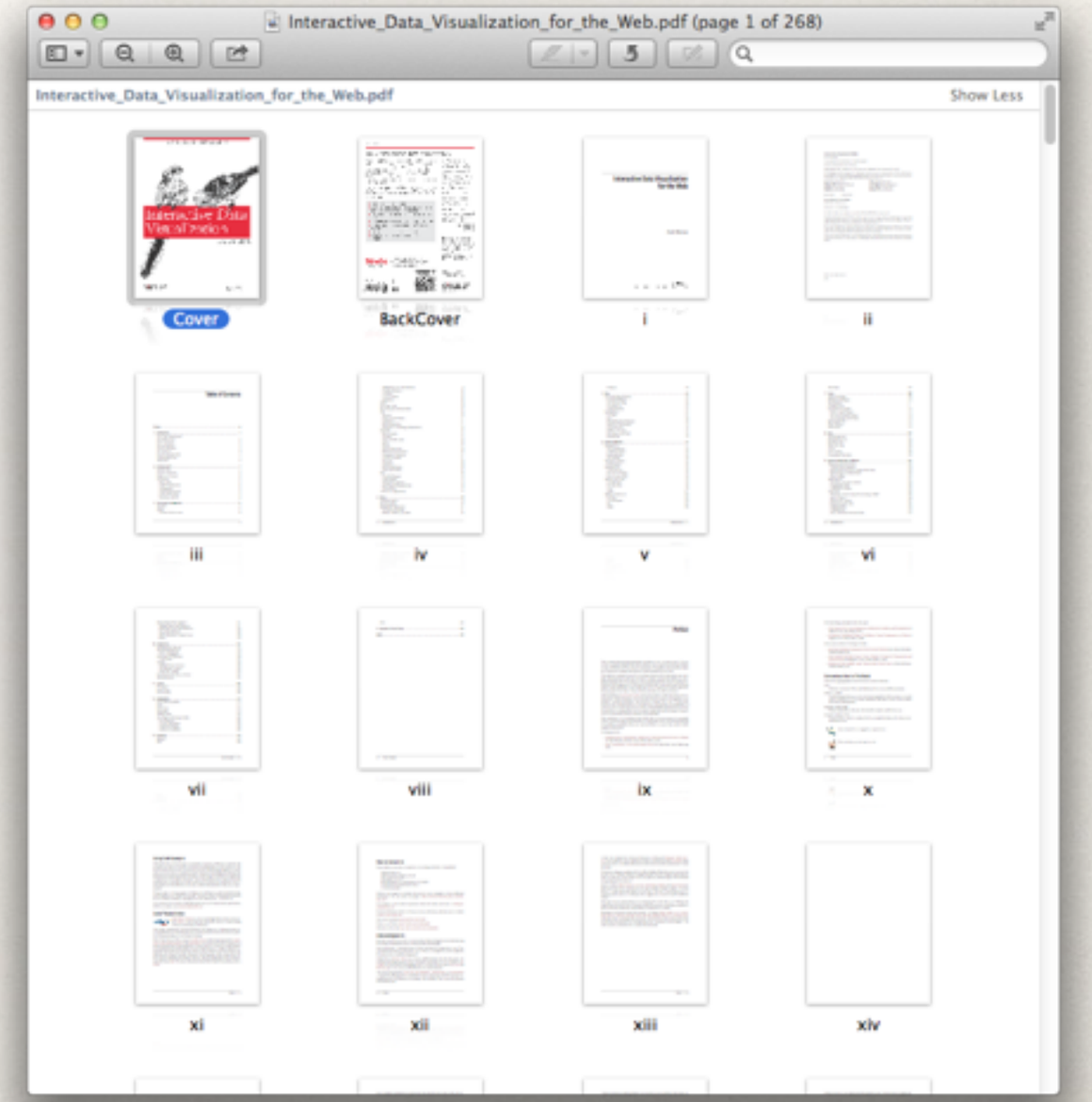
file38.c
file39.c
file40.c
file41.c
file42.c
file43.c
file44.c
file45.c
file46.c
file47.c
file48.c
file49.c
file50.c
file51.c
file52.c
/file1.c, line 408 of 834
if (IS_GET_DAT (pcbla1_ptr))
{
/* Get DSL Information */
/* the macro call IS_GET_DAT has ju
* the DPB for us, how lucky we are!!
*/
dslinfo.dsl = dpb_ptr->port;
/* Use RTretval for RTERRASSRT/RTC
RTretval = DBfrdtup(RLDSLEQUIP, &
switch(RTretval) {
case GLSUCCESS:
break;
stats 327/327/327
lines 15255/15255/15255
files 52/52/52

SeeSoft

Text document overview





Text document overview

census1.html — UNREGISTERED

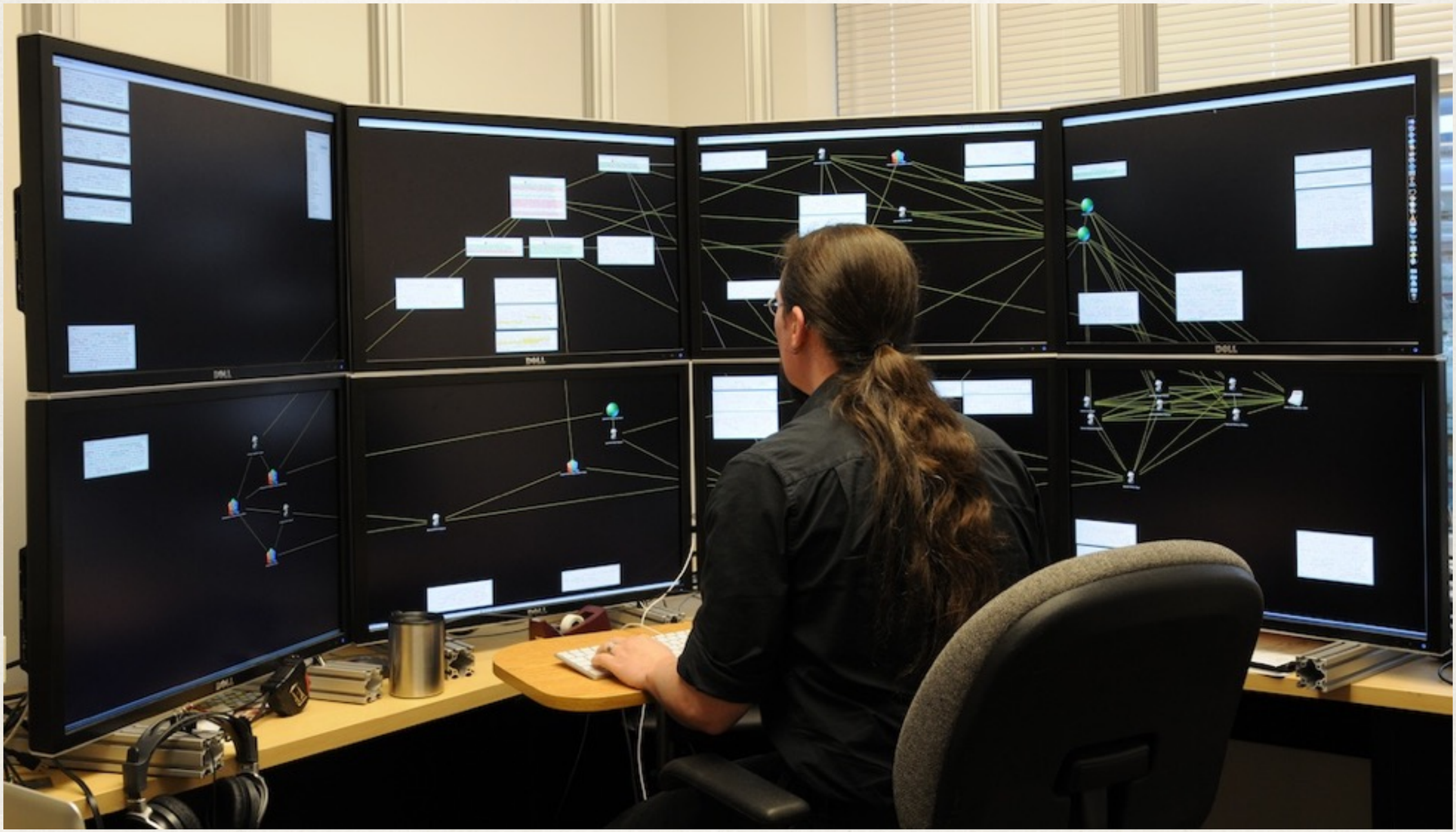
census1.html

```
32
33          function makeScatterplot(){
34              var margin = {top:20, bottom:20, left:60, right: 20};
35              var width = 500, height = 500;
36              var xValue = function(d){return d[0]};
37              var yValue = function(d){return d[1]};
38              var xScale = d3.scale.linear();
39              var yScale = d3.scale.linear();
40              var xAxis = d3.svg.axis().scale(xScale).orient("bottom");
41              var yAxis = d3.svg.axis().scale(yScale).orient("left");
42
43
44
45              function chart(selection){
46
47                  selection.each(function(data){
48
49                      xScale.range([0,width - margin.left - margin.right])
50                      .nice()
51                      .domain(d3.extent(data, xValue));
52
53
54                      yScale.range([height - margin.top - margin.bottom, 0])
55                      .nice()
56                      .domain(d3.extent(data, yValue));
57
58                      var svg = d3.select(this).append("svg")
59                      .attr({width:width, height:height});
60
61                      var canvas = svg.append("g")
62                      .attr("transform","translate("+margin.left +","+margin.top+")");
63
64                      // create the dots
65                      var dots = canvas.selectAll("circle")
66                      .data(data)
67                      .enter()
68                      .append("circle");
```

Line 1, Column 16 | Tab Size: 4 | HTML

Solution 1: pixel space

Get bigger screens!



Solution 2: data space / attribute space

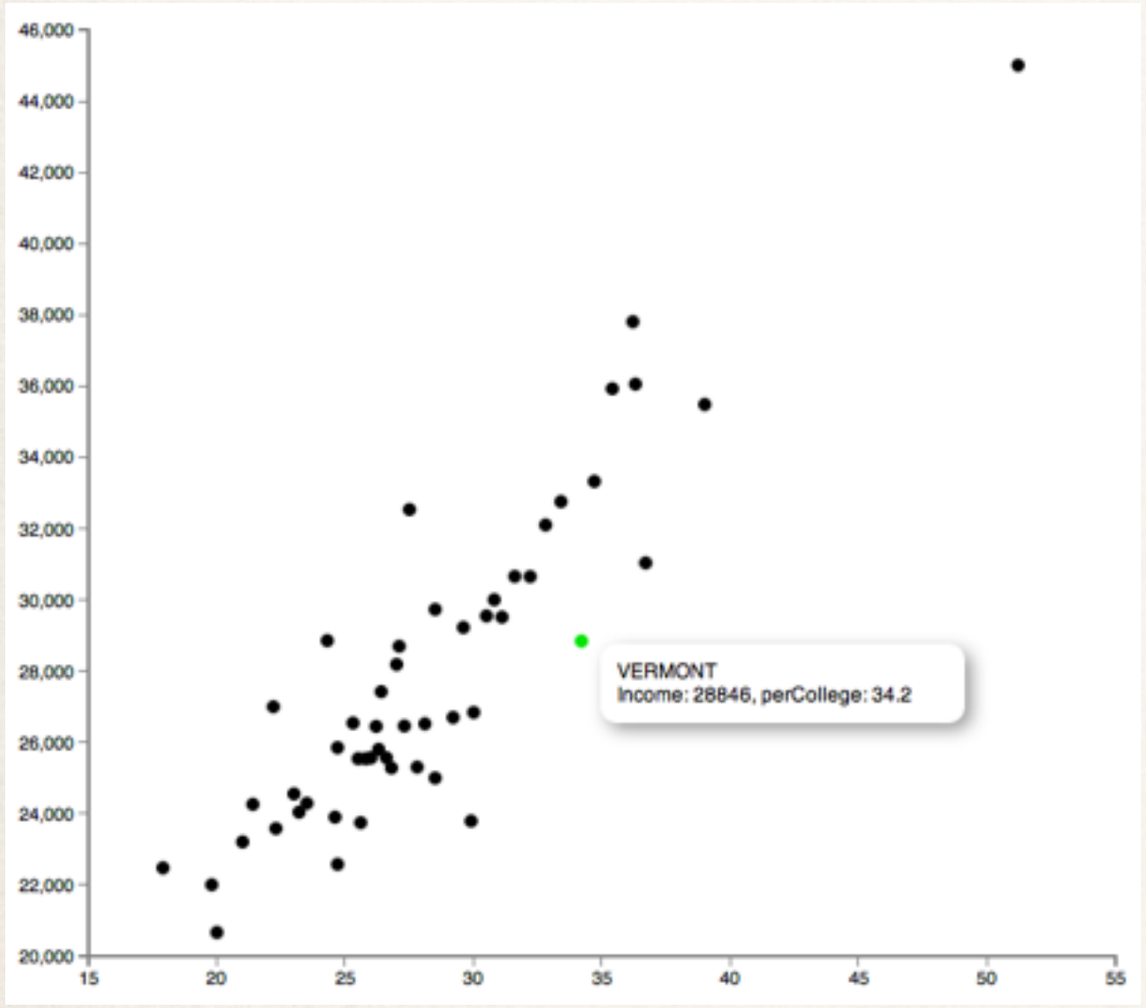
Reduce # of attributes

Reduce # of items

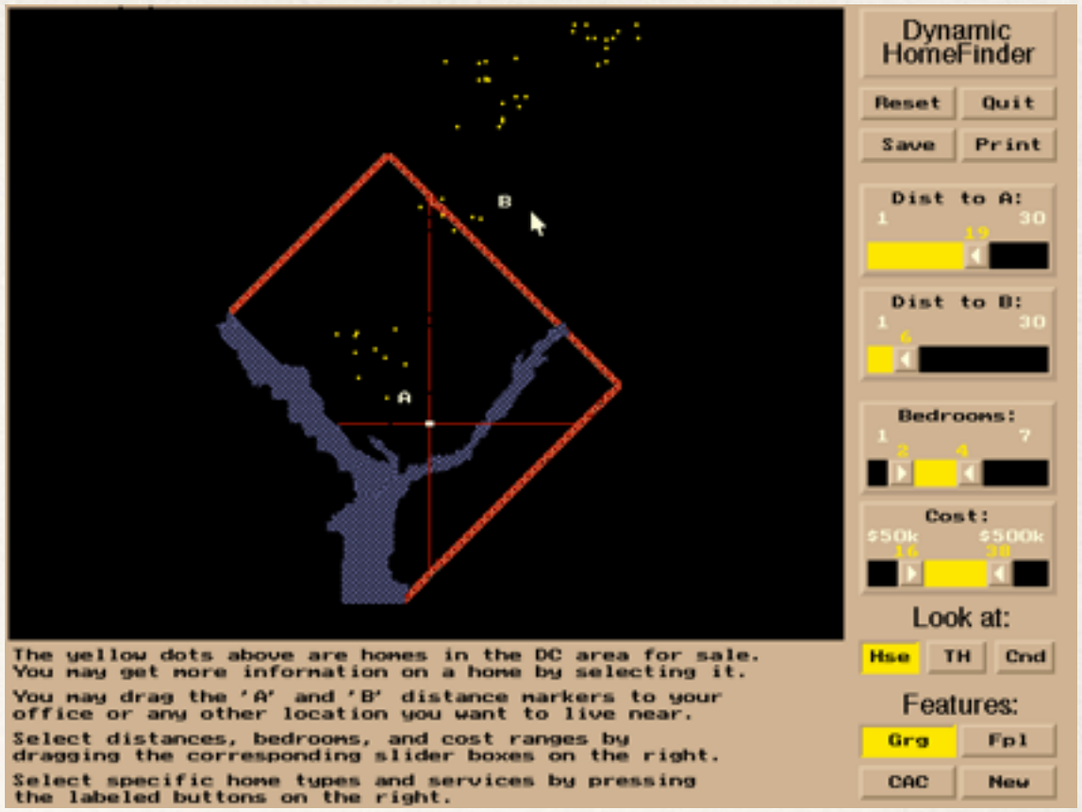
	A	B	C	D	E	F	G
1	doctor	name	companions	start	end	episodes	duration
2	1	William Hartnell	10	1963	1966	135	3288
3	2	Patrick Troughton	5	1966	1970	127	3183
4	3	Jon Pertwee	3	1970	1974	129	3206
5	4	Tom Baker	8	1974	1982	174	4248
6	5	Peter Davidson	6	1982	1984	69	1800
7	6	Colin Baker	2	1984	1987	31	1029
8	7	Sylvester McCoy	2	1987	1989	42	1025
9	8	Paul McGann	1	1996	1996	1	84
10	9	Christopher Eccleston	3	2005	2005	13	568
11	10	David Tennant	5	2005	2010	48	2368
12	11	Matt Smith	4	2010	2013	44	2083

Reduce range of items

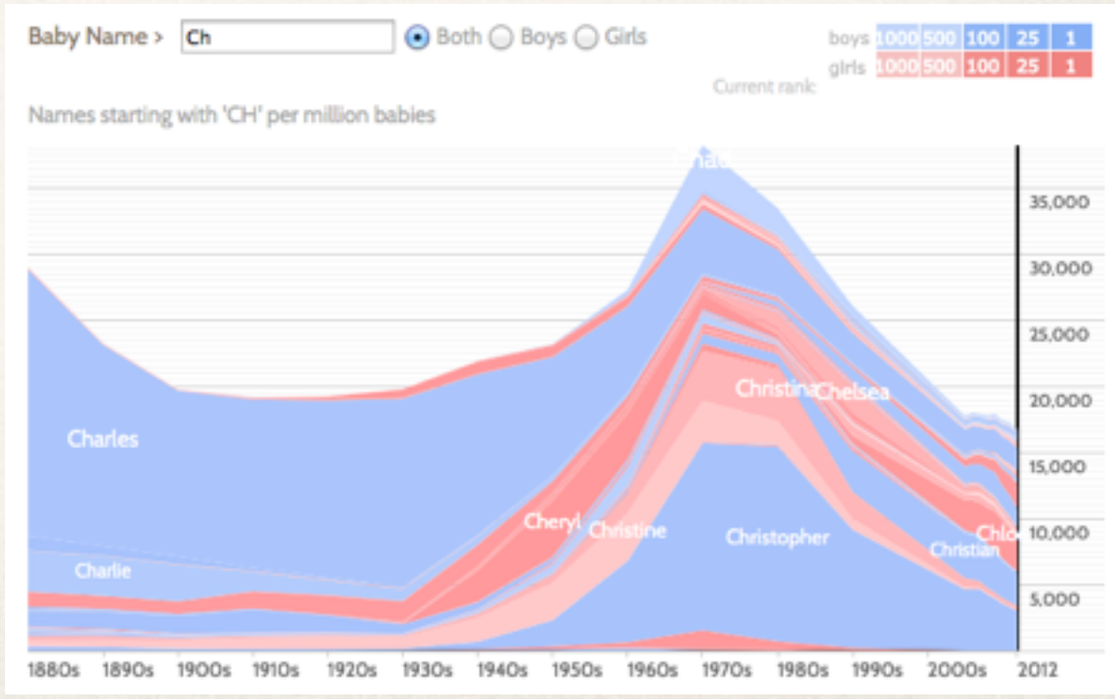
Elimination



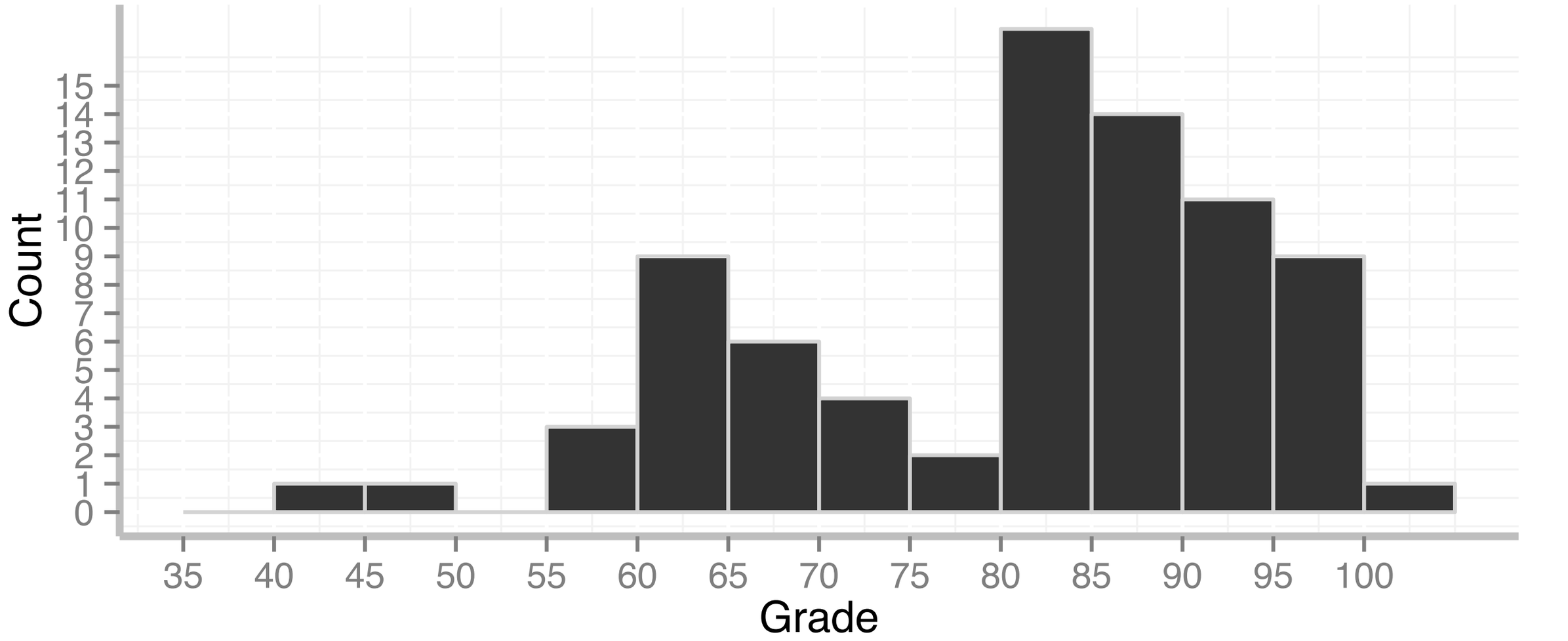
eliminate attributes



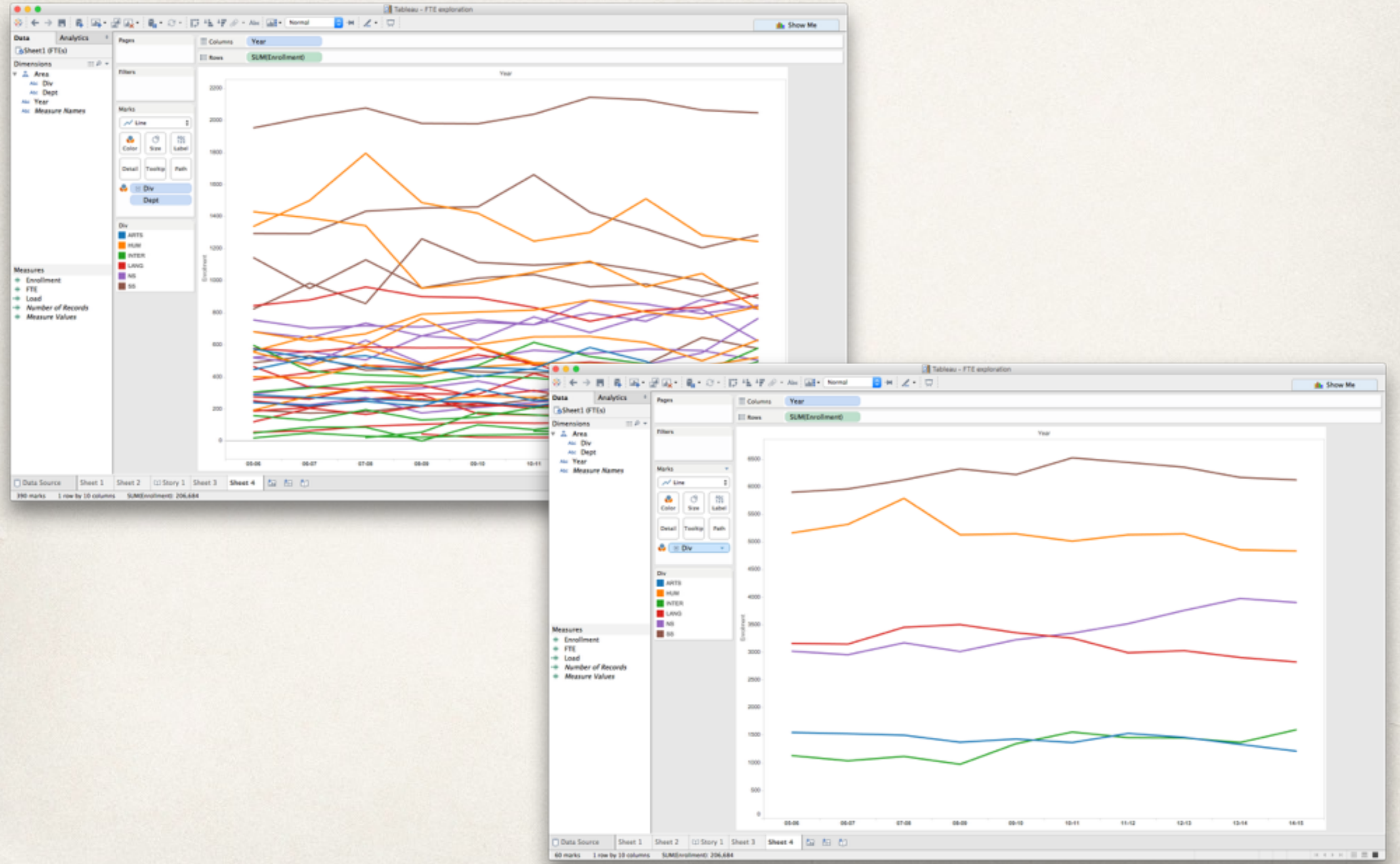
eliminate items



Aggregation



Aggregation



Aggregation

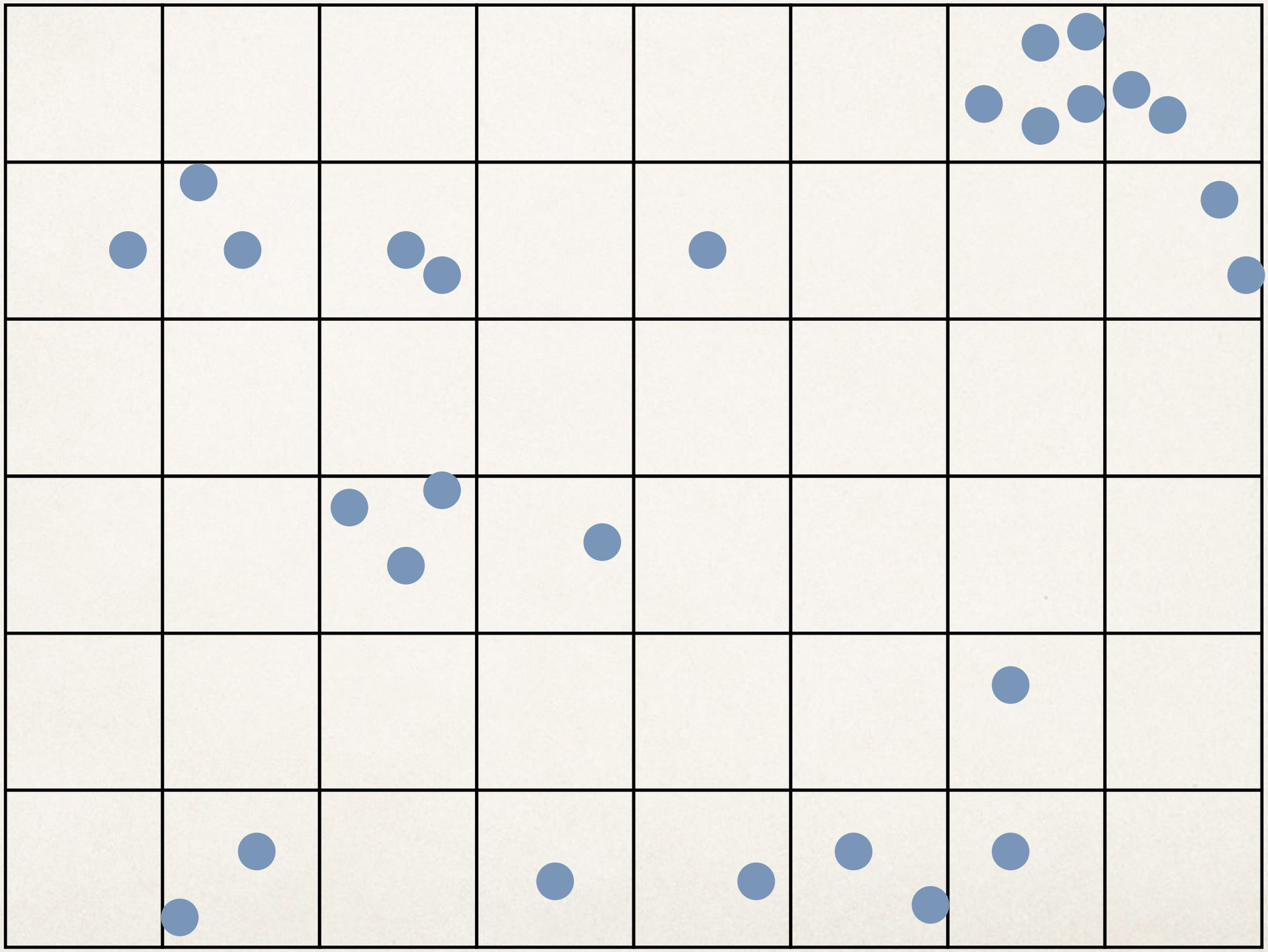
What to group by?

- categorical data or shared data values
- spatial position
- algorithmic (i.e., clustering based on attributes)
- user defined

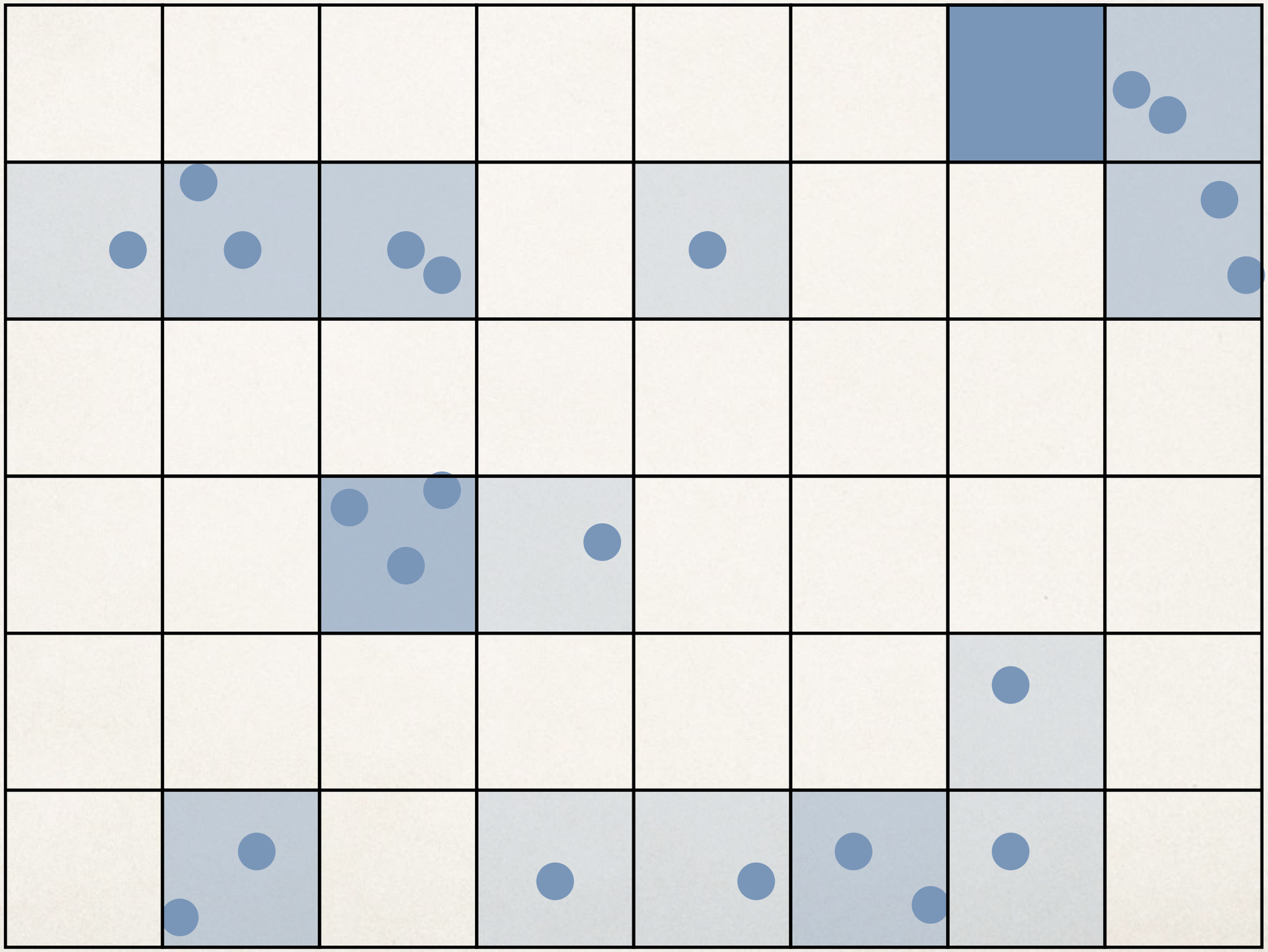
How to group?

- math function on attributes (e.g., min, max, mean, mode, sum, count, etc...)
- semantics or shared abstraction

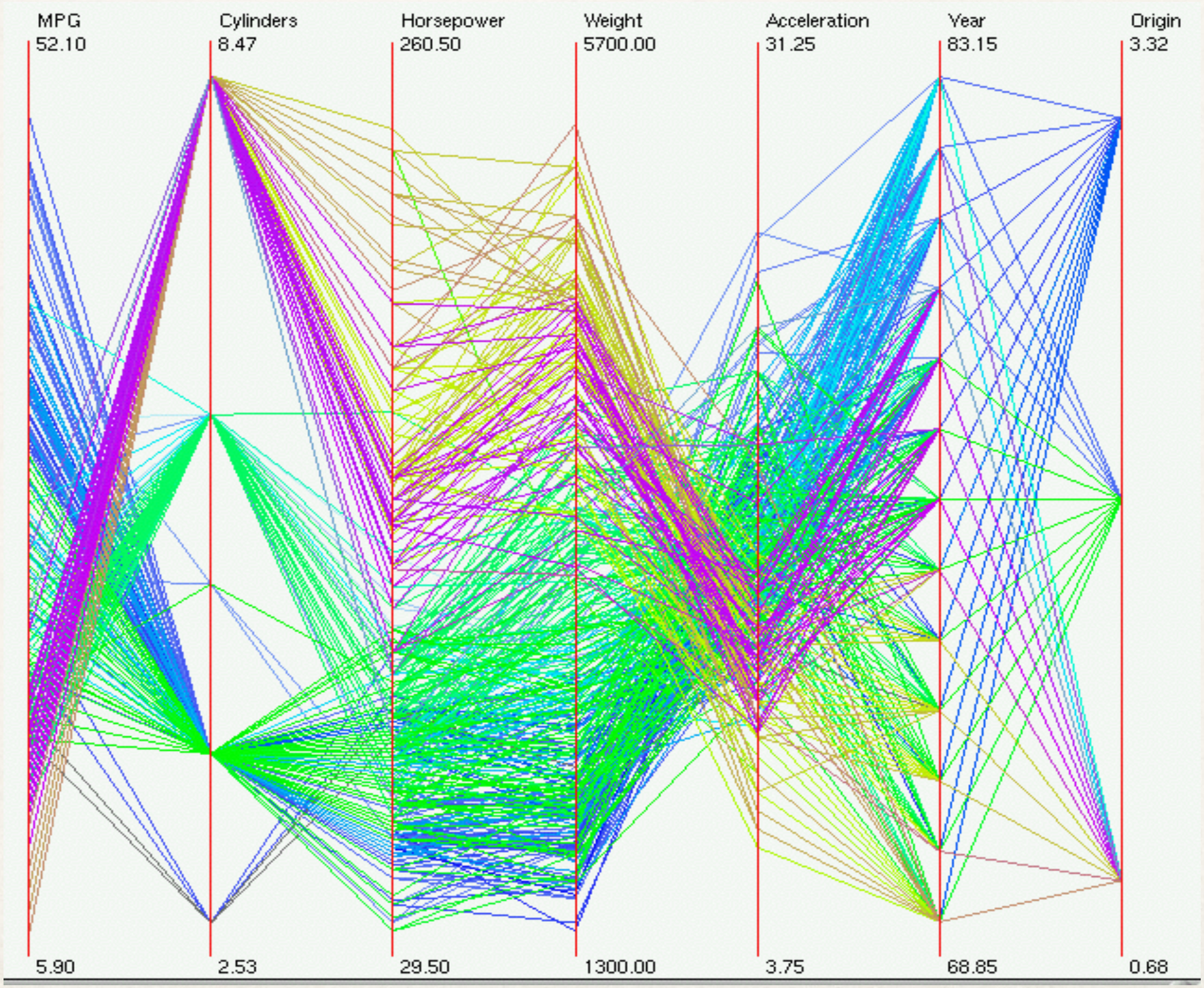
Pixel-level binning



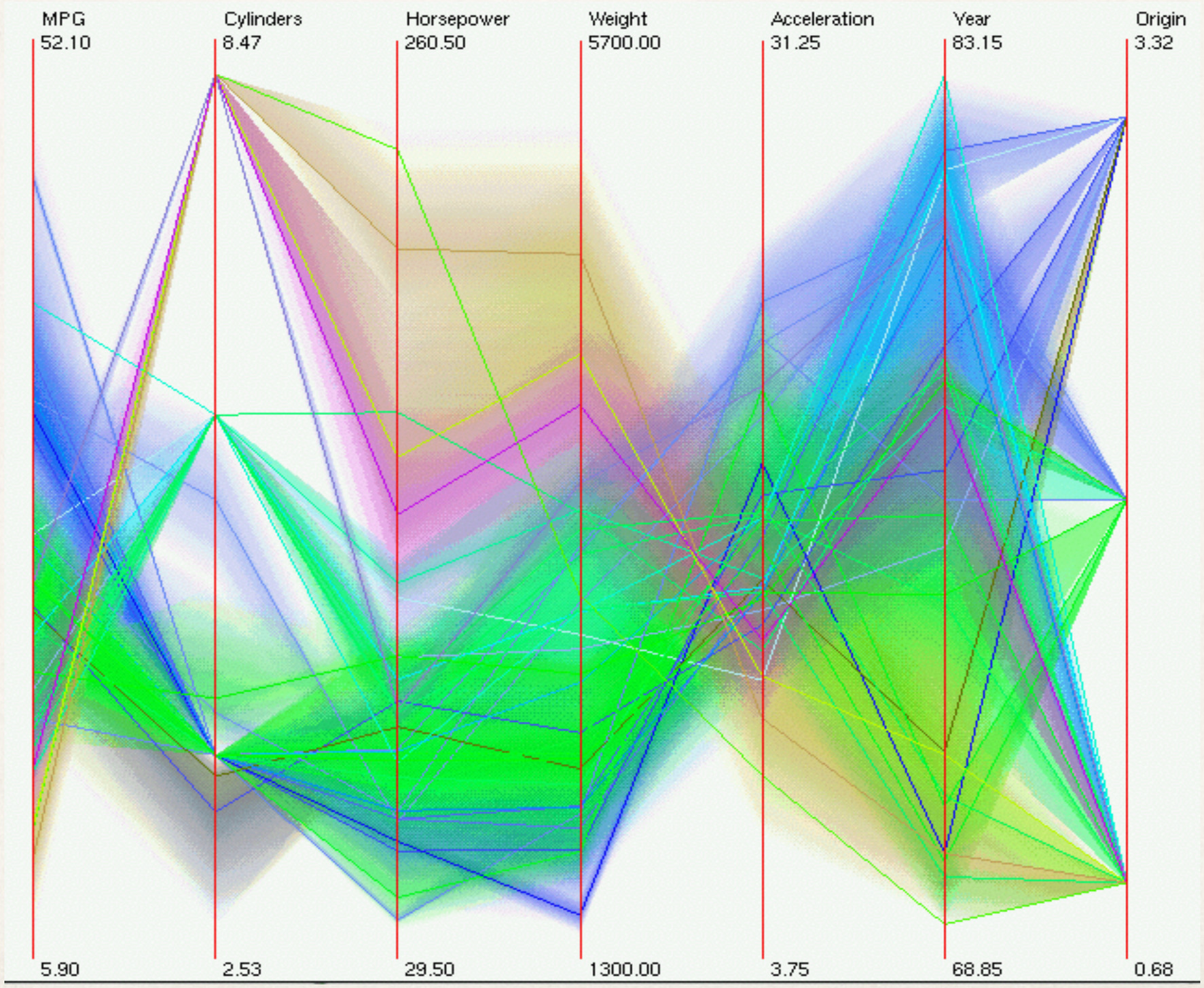
Pixel-level binning



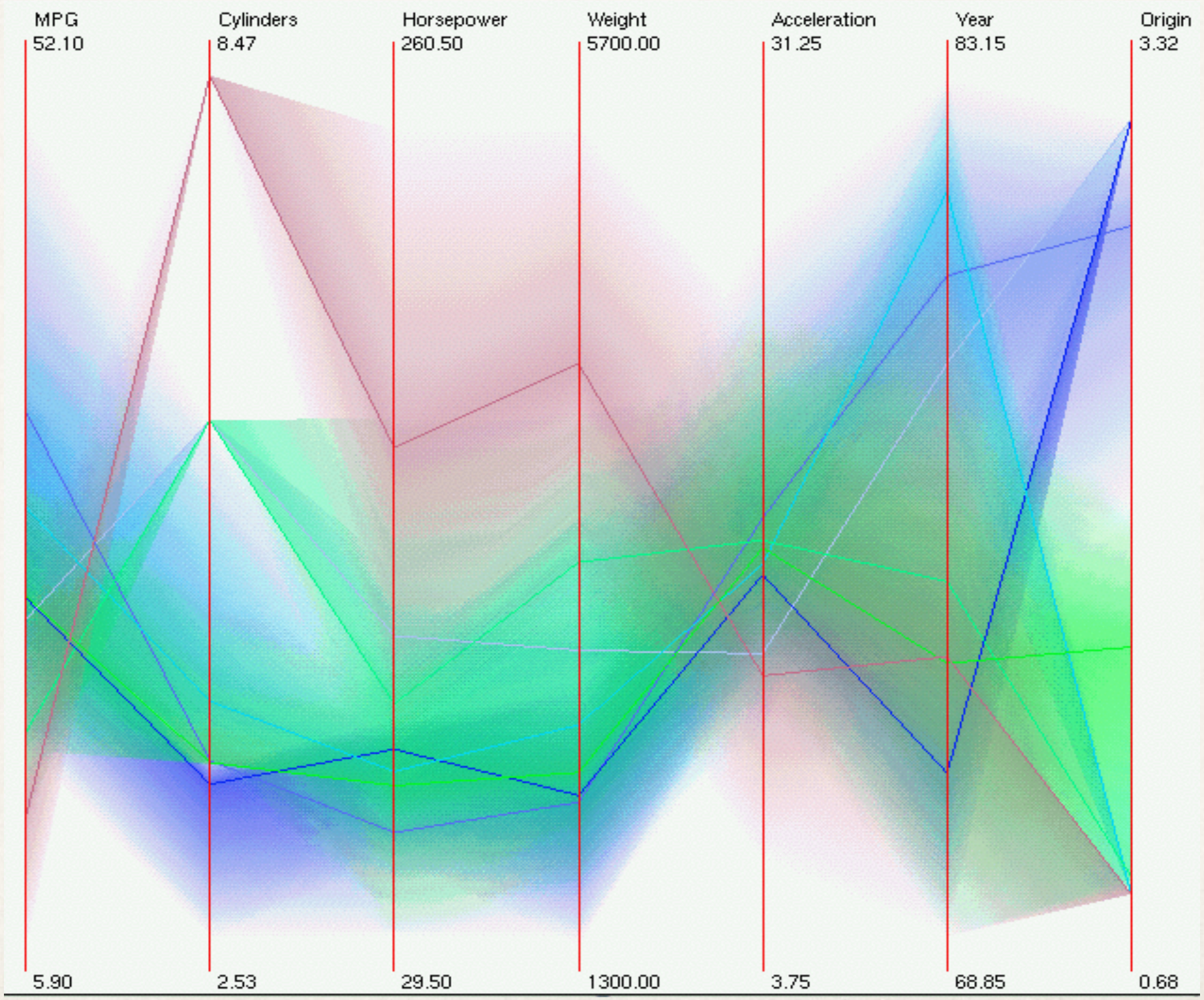
Aggregation



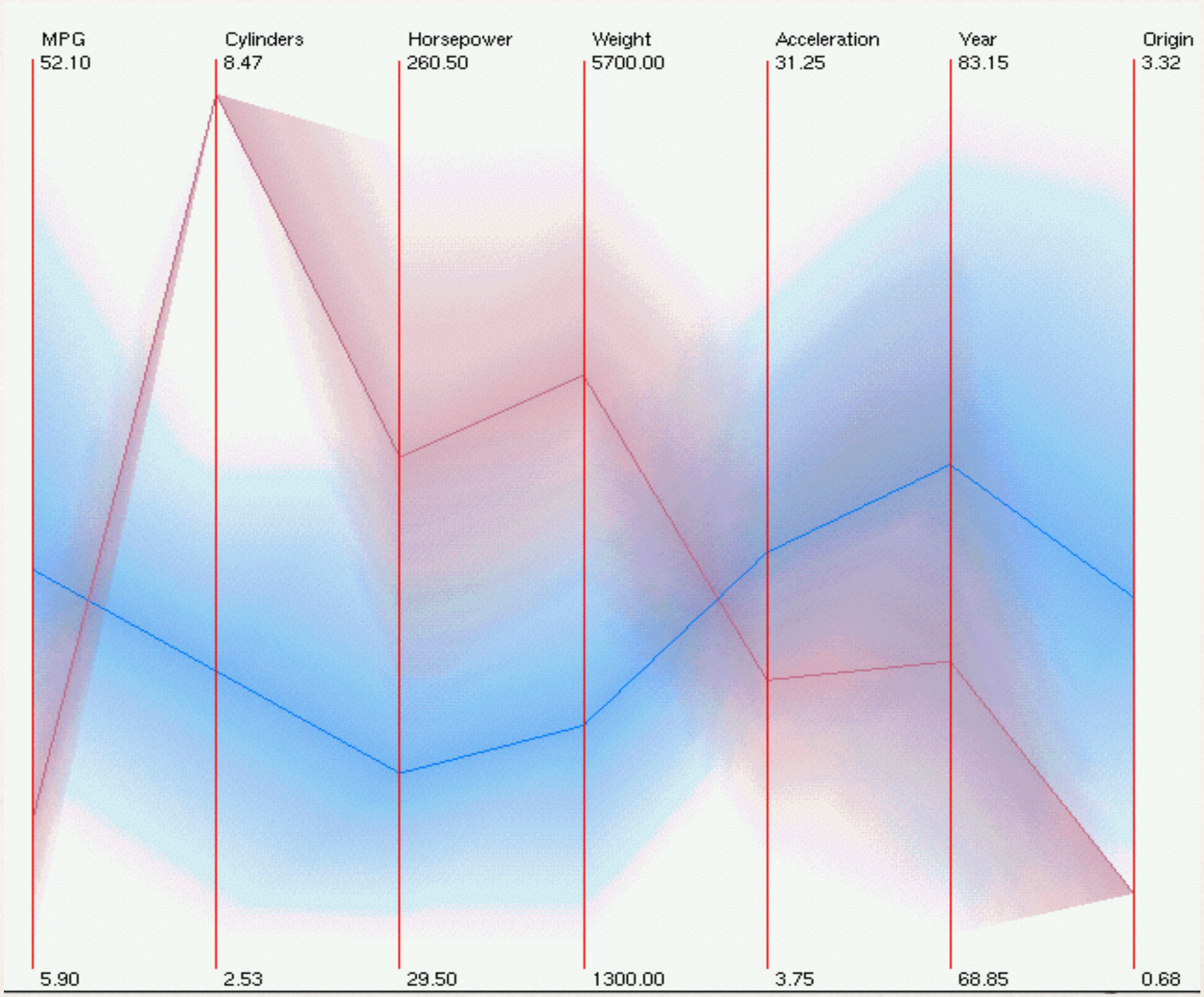
Aggregation

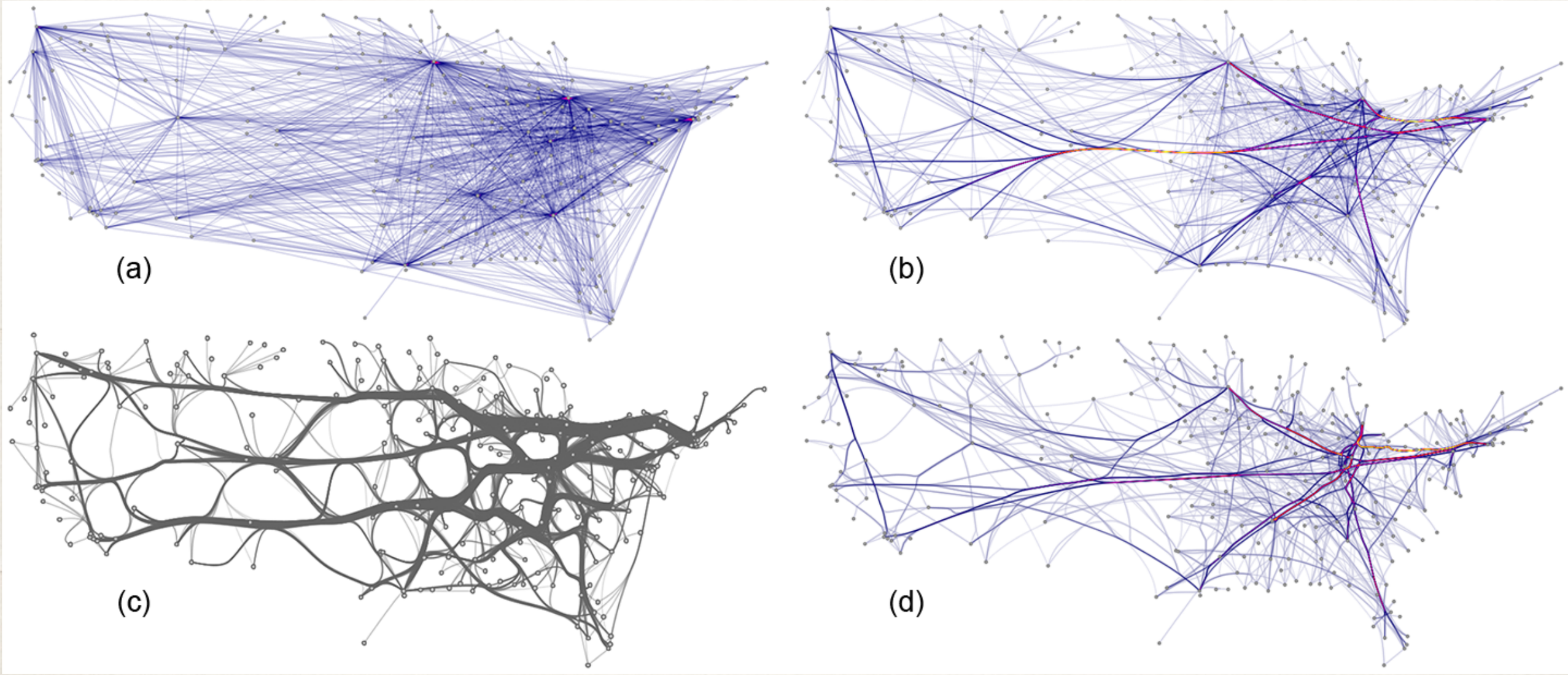


Aggregation

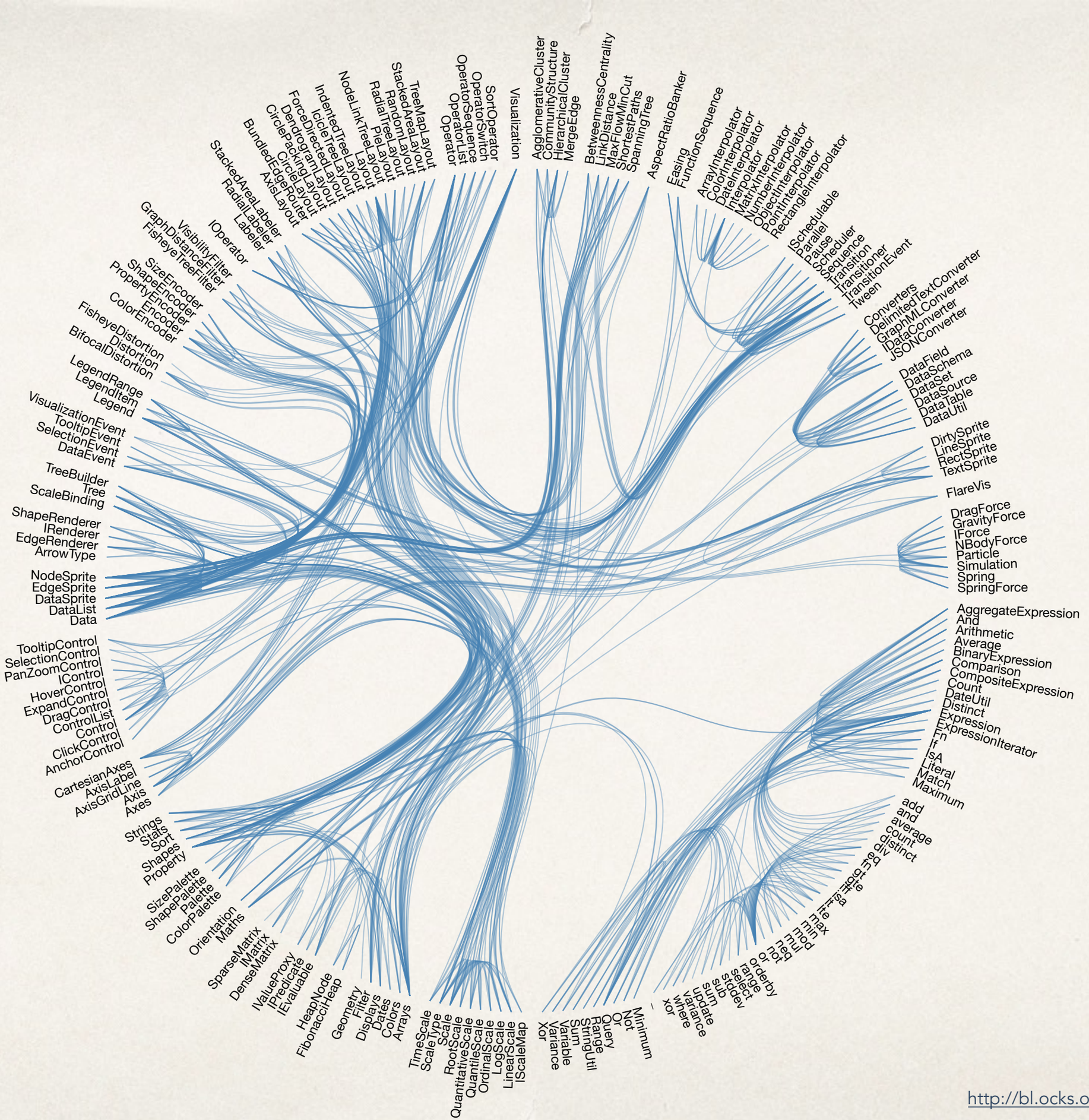


Aggregation



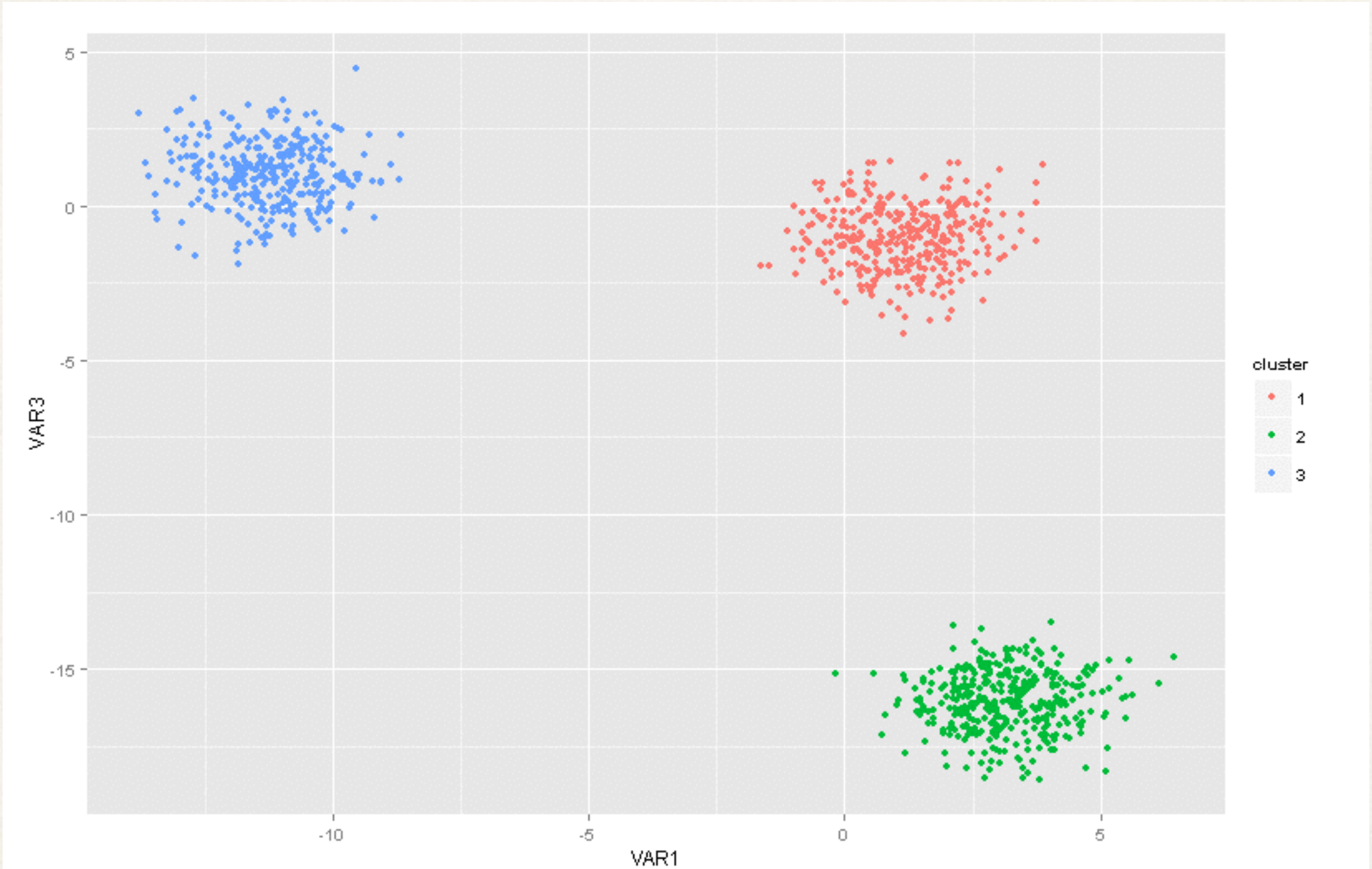


Holden and van Wijk, “Force Directed Edge Bundling for Graph Visualization”, 2009



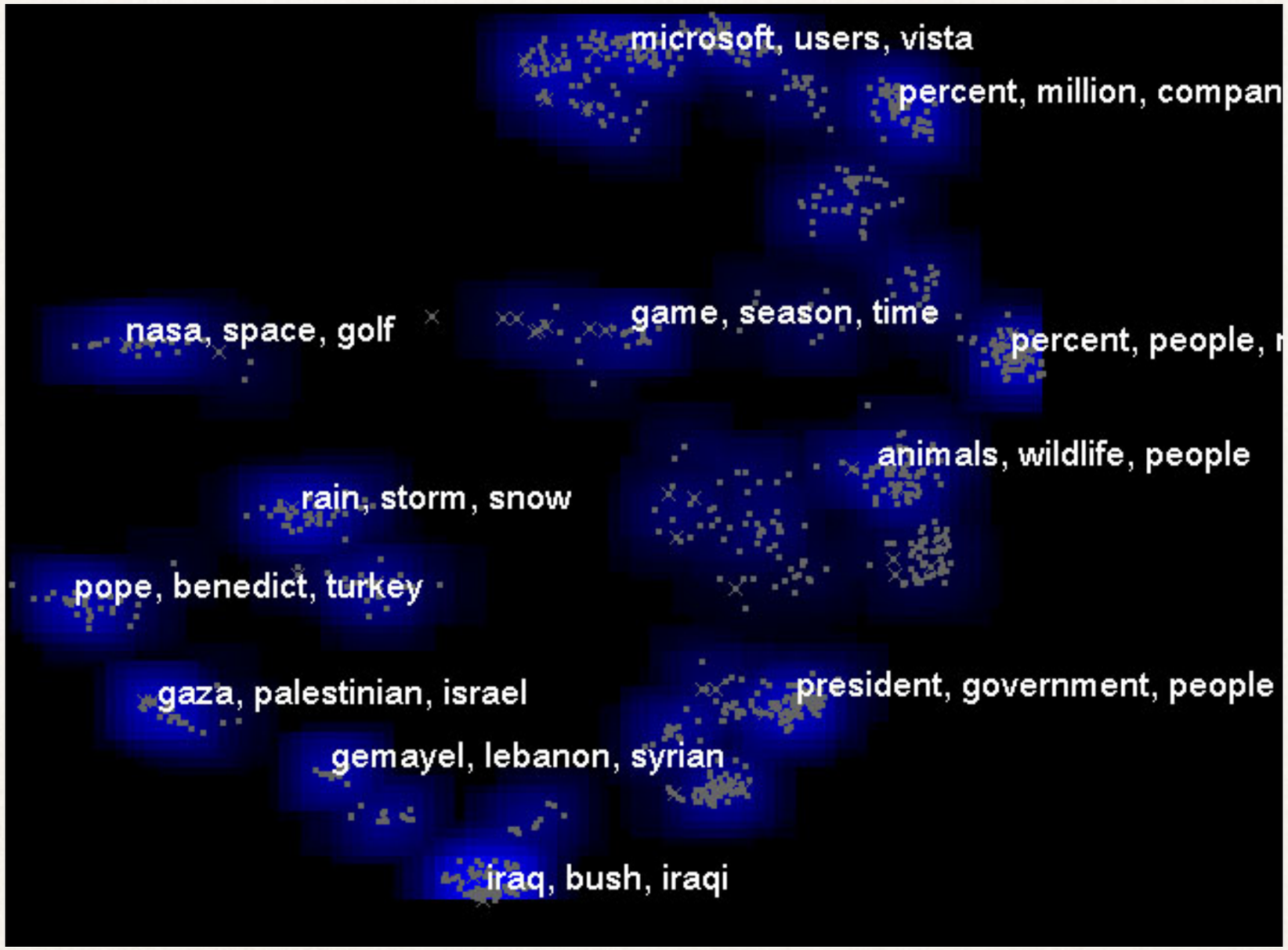
http://bl.ocks.org/mbostock/1044242

Clustering



http://statistical-research.com/dirichlet-process-infinite-mixture-models-and-clustering/

Clustering



InSpire, PNNL