

# Responsive Charts: Using and Extending RespVis

Information Visualisation SS 2021 - Group 2

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# Introduction to RespVis

- Author: Peter Oberrauner.
- Responsive data visualizations based on flexible components.
- Language: TypeScript.
- Layouting: Custom layouting system.
- Frontend: SVG.
- Source: [github.com/AlmostBearded/respvis](https://github.com/AlmostBearded/respvis)

# RespVis - Functionality

- Extension for d3.js.
- Creates charts with d3.js components.
- Support for existing d3.js features:
  - Different scale types.
  - Interactivity.

# RespVis - Layouting

- **Functionality:**
  - Create SVG structure (legend, axis, individual chart) with layout attributes.
  - Layouter duplicates structure with DIV elements.
  - Browser handles DIV layout based on built-in CSS layout.
  - Layout of DIV structure transferred to SVG elements.
- **Should support full range of browser features, especially:**
  - Grid - [css-tricks.com/snippets/css/complete-guide-grid](https://css-tricks.com/snippets/css/complete-guide-grid)
  - Flexbox - [css-tricks.com/snippets/css/a-guide-to-flexbox](https://css-tricks.com/snippets/css/a-guide-to-flexbox)

# RespVis - Code Example

```
<script type="module">
import data from './data/scatterplot-matrix.js';
const root = d3.select('#chart');
const layouter = root.append('div').call(respVis.layouter);
const chartDatum = respVis.dataChartPointMatrix({
  datasets: data.datasets,
  radius: 2
})
const chart = layouter.append('svg').datum(chartDatum).call(respVis.scatterMatrix)
window.addEventListener('resize', configure);
configure();

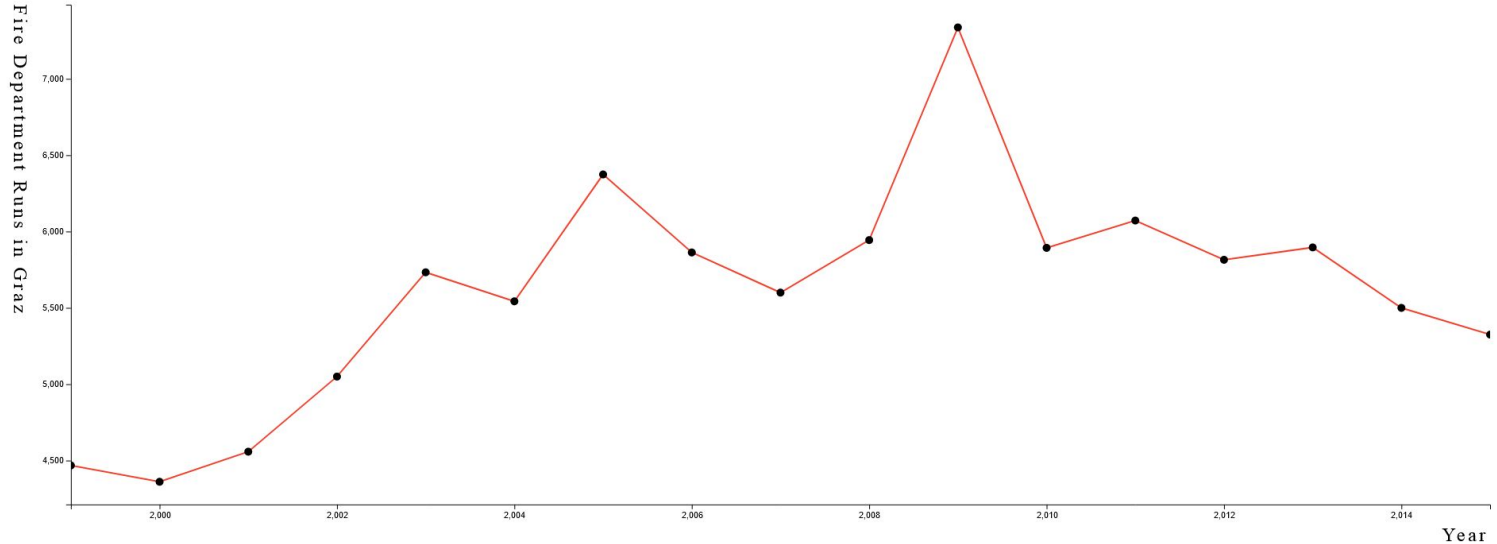
function configure() {
  chart.datum(chartDatum);
}
</script>
```

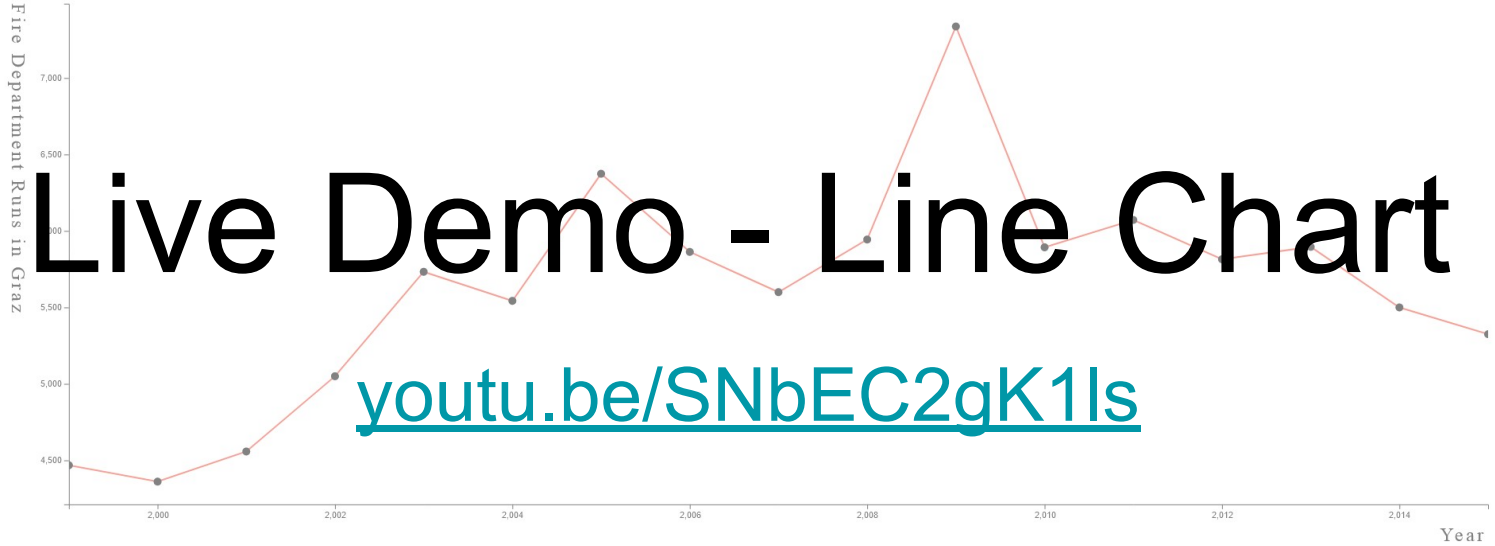
# RespVis - New Components

- Based on existing RespVis components
- Our components:
  - Line Chart
  - Multi Line Chart
  - Connected Scatterplot
  - Small Multiples:
    - Line Chart
    - Bar Chart
    - Scatterplot Matrix

# Line Chart

- Same line and point logic as connected scatterplot.
- Options: toggle points, line thickness, line color, bezier curve.

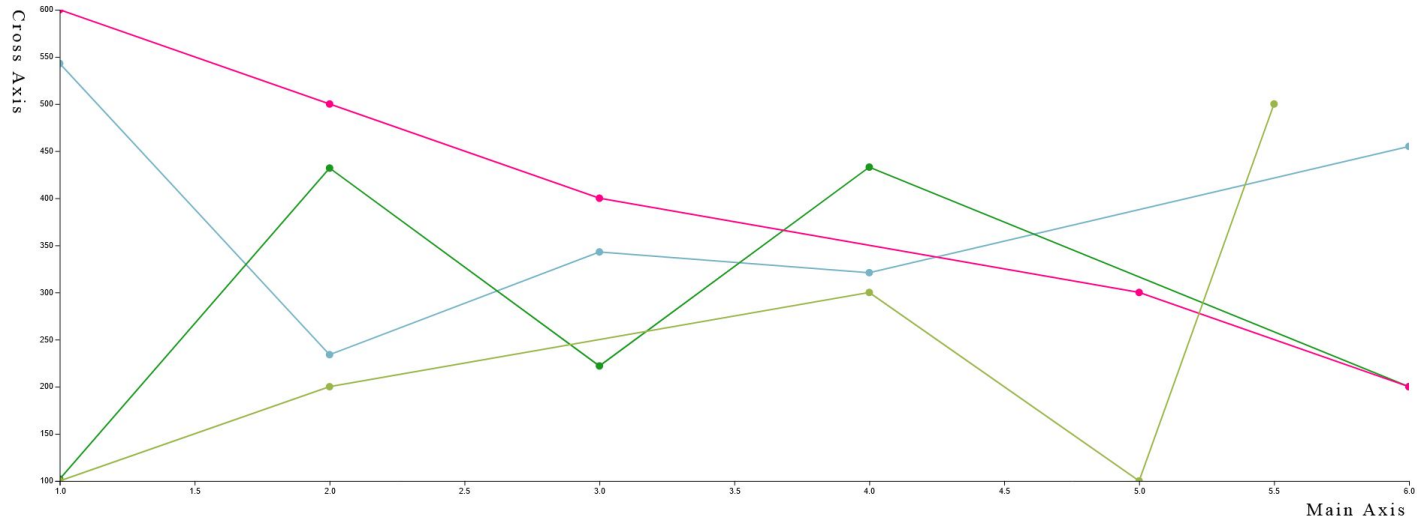




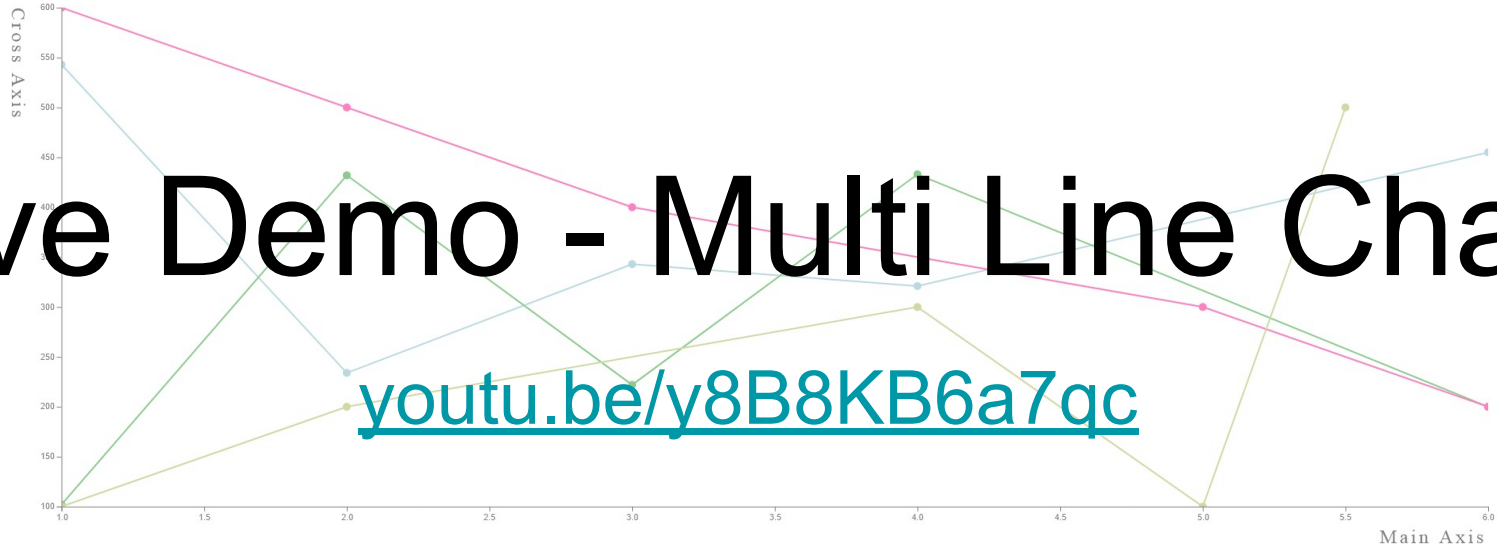


# Multi Line Chart

- Based on line chart.
- Compute cross and main scale based on all cross / main values.
- Categorical line colors.



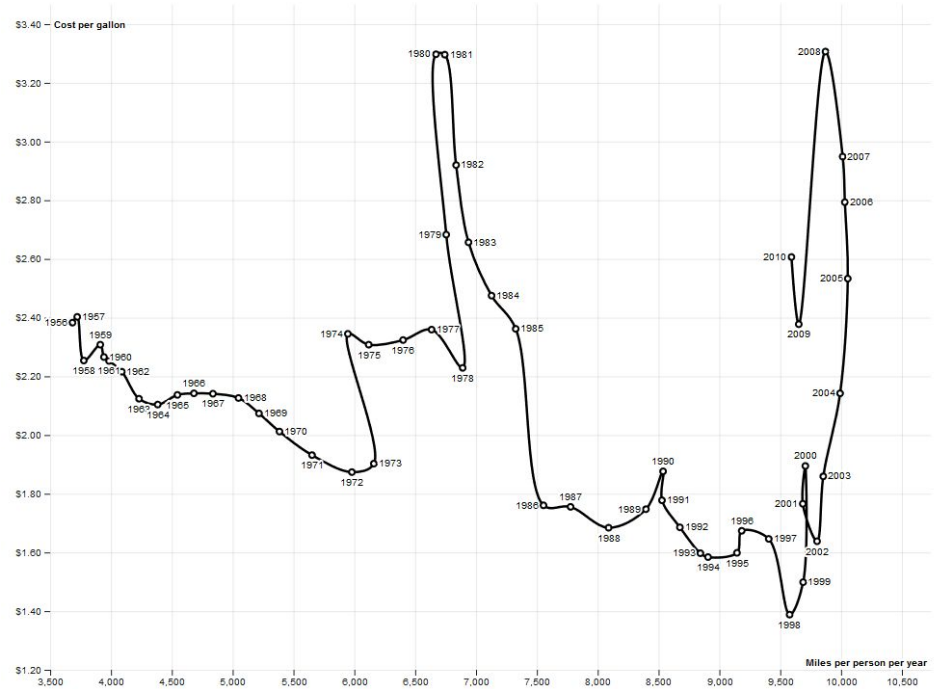
# Live Demo - Multi Line Chart



[youtu.be/y8B8KB6a7qc](https://youtu.be/y8B8KB6a7qc)

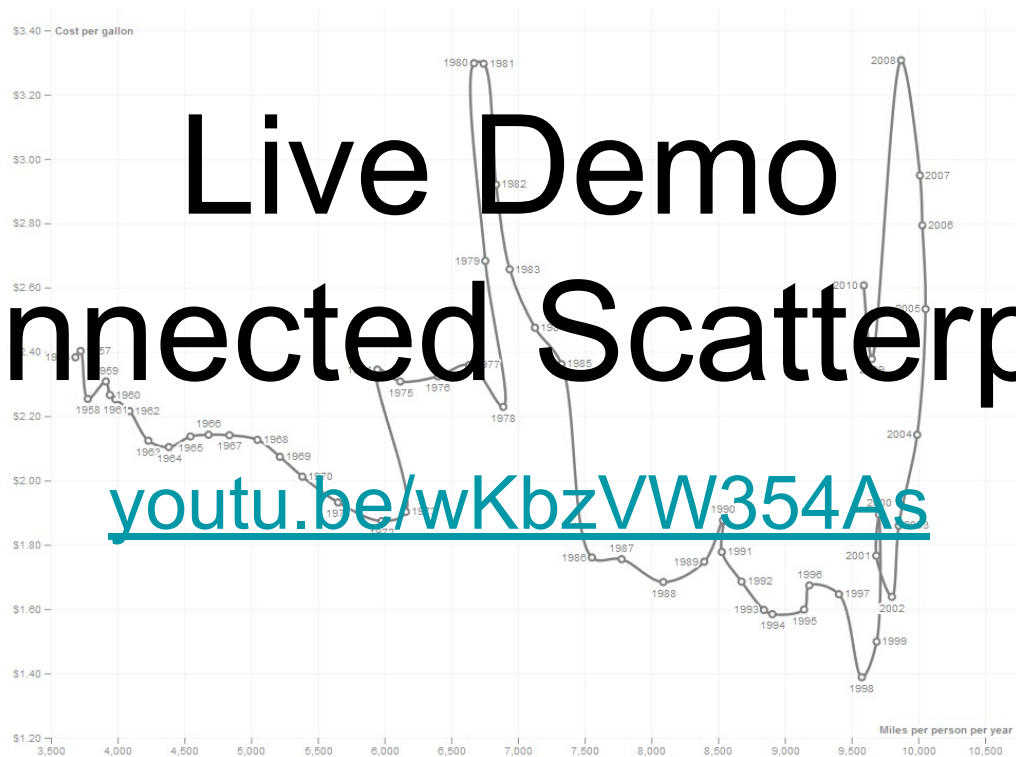
# Connected Scatterplot

- Regular scatterplot with each point connected by line (in order)
- Functionality:
  - Based on existing scatterplot.
  - Additionally render path for all data points.
  - Each point also has label.
  - Optional: smooth line with cubic bezier curve.



Example by Mike Bostock, rendered with d3 - <https://observablehq.com/@d3/connected-scatterplot>

# Live Demo Connected Scatterplot



[youtu.be/wKbzVW354As](https://youtu.be/wKbzVW354As)

# Small Multiples

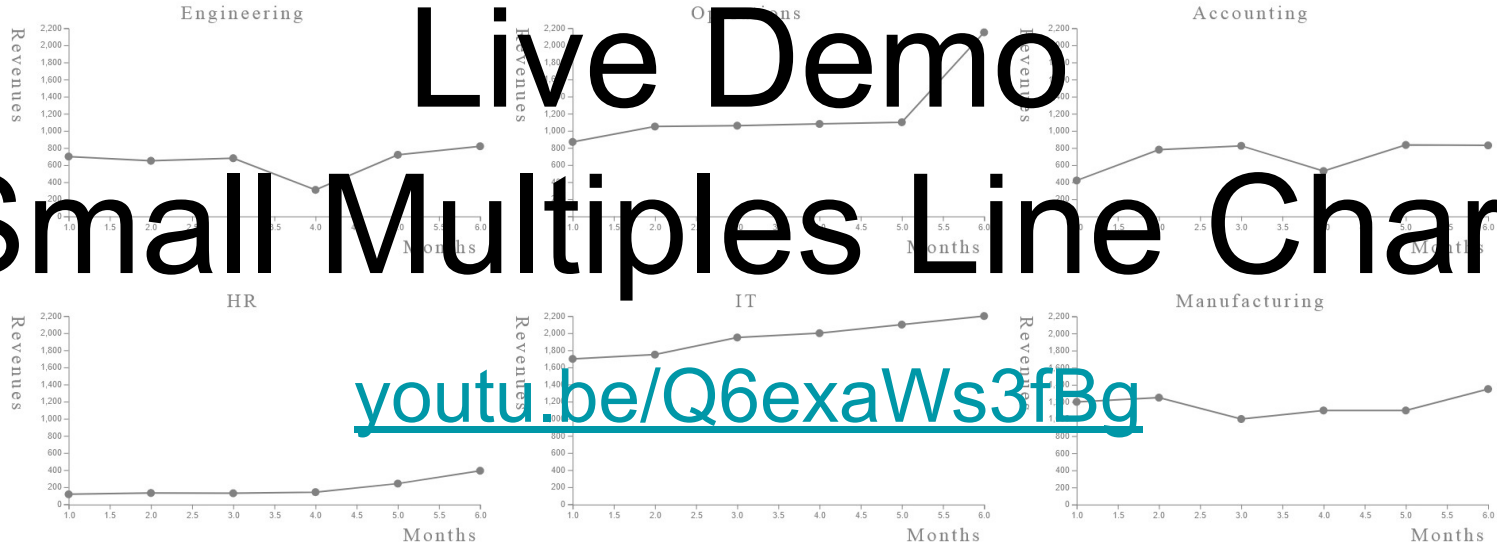
- Popularized by Edward Tufte.
- Series/grid of similar visualisations.
- Usually same scale/axes for better comparison
- Compare different datasets or parts of same dataset.

# Small Multiples Line Chart / Bar Chart

- 3 dimensions:
  - Outer dimension: defines number of charts.
  - Main dimension: same for all charts - linear for line chart, band for bar chart.
  - Cross dimension: linear scale over all data points.
- Grid layout:
  - Compute number of columns and rows.
  - For each chart: insert new svg - position automatically calculated through browser.

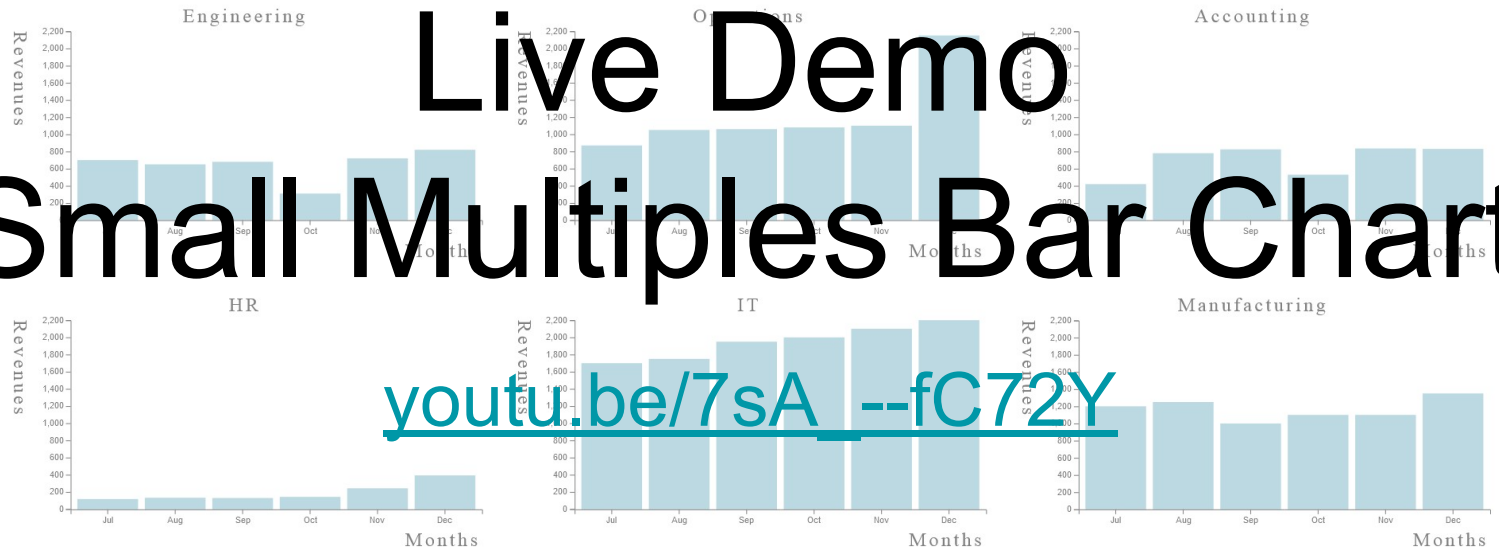
# Live Demo

# Small Multiples Line Chart



[youtu.be/Q6exaWs3fBg](https://youtu.be/Q6exaWs3fBg)

# Live Demo Small Multiples Bar Chart



[youtu.be/7sA--fC72Y](https://youtu.be/7sA--fC72Y)



# Scatterplot Matrix

- Based on small multiples implementation.
- Dataset with multiple dimensions.
- For each pair of dimensions: create scatterplot.
- In diagonal: title of dimension.

# Live Demo - Scatterplot Matrix

