



SimMapper

A Tool for Creating Similarity Maps from Multidimensional Datasets

Group 3

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Information Visualization

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Project Topic

- Similarity Map Tool
- GUI around DruidJS:
 - JS library for dimensionality reduction.
- Functionality:
 - Select dataset
 - Reduce dimensions
 - Visualize
 - Export

Project Setup

- TypeScript
- Gulp
 - Taskrunner
- Electron
 - For creating a stand-alone application.
- Rollup
- Bulma
 - Lightweight CSS library

- Libraries

- Druid JS
- D3
- Plotly



DruidJS



- JavaScript library for dimensionality reduction.
- Project high-dimensional data to a lower dimensionality.
- Implemented dimensionality reduction methods.
 - PCA
 - TSNE
 - ISOMAP
 - UMAP
 - ...

Open and Use CSV Datasets



- D3 library for CSV import.
 - Dataset is required.
- Select CSV encoding and separator.
 - UTF8, UTF16, ...
 - Semicolon, Comma, Tabulator, ...
- Display preview to user.
- Select dimensions.

Data Preview

CSV Encoding: UTF-8 | CSV Separator: ,

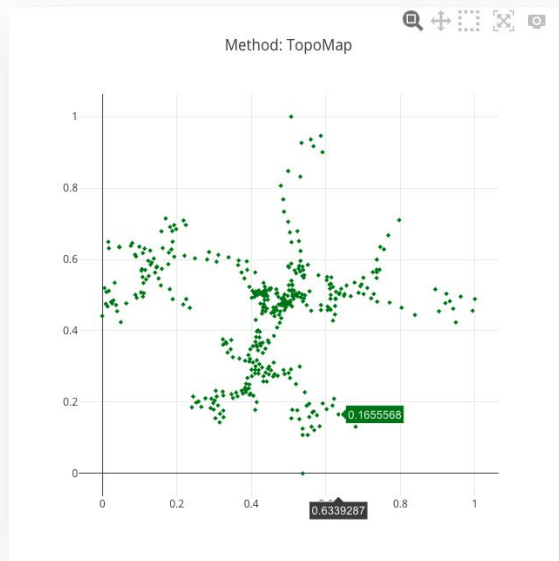
<input checked="" type="checkbox"/> Name	<input checked="" type="checkbox"/> Manufacturer	<input checked="" type="checkbox"/> Type	<input checked="" type="checkbox"/> Calories	<input checked="" type="checkbox"/> Protein (g)	<input checked="" type="checkbox"/> Fat (g)	<input checked="" type="checkbox"/> Sodium (mg)	<input checked="" type="checkbox"/> Fibre (g)	<input checked="" type="checkbox"/> Carbo (g)	<input checked="" type="checkbox"/> Sugar (g)	<input checked="" type="checkbox"/> Shelf	<input checked="" type="checkbox"/> Potassiu
100%_Bran	N	cold	70.00	4.00	1.00	130.00	10.00	5.00	6.00	3.00	
100%_Natural_Bran	Q	cold	120.00	3.00	5.00	15.00	2.00	8.00	8.00	3.00	
All-Bran	K	cold	70.00	4.00	1.00	260.00	9.00	7.00	5.00	3.00	
All-Bran_with_Extra_Fiber	K	cold	50.00	4.00	0	140.00	14.00	8.00	0.00	3.00	
Almond_Delight	R	cold	110.00	2.00	2.00	200.00	1.00	14.00	8.00	3.00	

Select dataset | Cancel

Dimension Reduction with Druid.JS

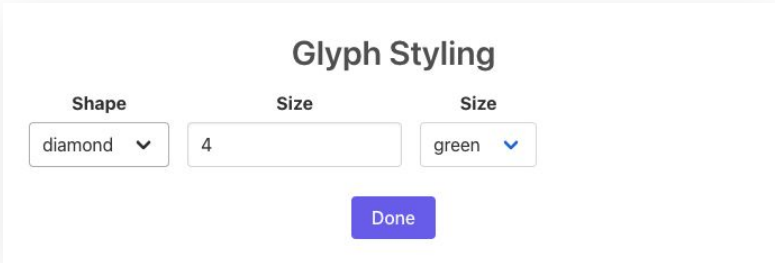


- Create a Druid Matrix (implemented in Druid.JS).
- Create new Druid object with parameters:
 - Druid Matrix
 - Dimension reduction method
- Transform to a 2D array.
- Normalize data.



Visualization with Plotly

- User defined glyph styling:
 - Size, color, shape
- Plotly options:
 - Visualization type (scatter plot)
 - Responsive
 - Buttons (zoom, pan, export, ...)

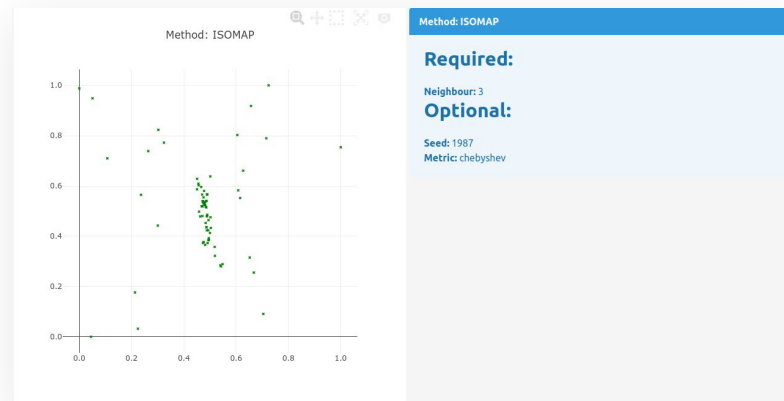


Glyph Styling

Shape: diamond ▾ Size: 4 Size: green ▾

Done

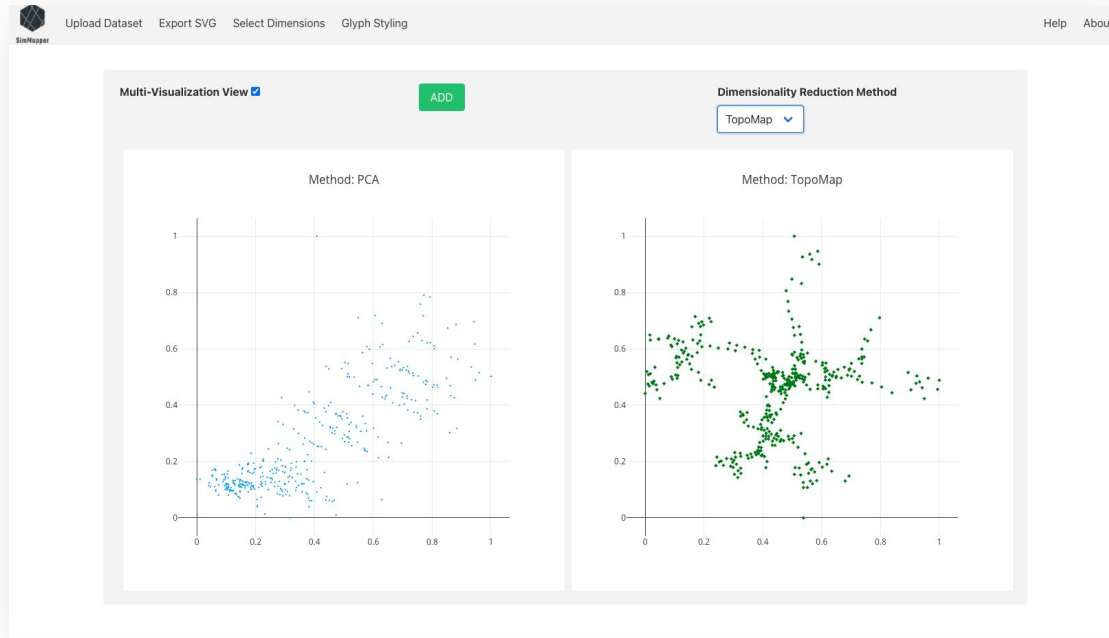
The image shows a 'Glyph Styling' control panel. It has three main sections: 'Shape' with a dropdown menu set to 'diamond', 'Size' with a text input field containing '4', and another 'Size' section with a dropdown menu set to 'green'. Below these is a blue 'Done' button.



Further Functionality

- Responsive SVG export.
 - Replaced Plotly's export functionality.
- Help page.
- Automatic application configuration.
 - Remembers window size and position.
- Gitlab pages.
 - https://mj_massacre.gitlab.io/simmapper/view

Live Demo



Future Work

- Multiple visualizations in one view.
 - Already started.
- Update individual graphs.
 - Select dimension reduction method, parameters, etc.
- Optimize/Extend export functionality.
- Extend visualization options (glyph styling).
- Optionally: Create Svelte components for different elements.



Thank you for your attention!



Questions?



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