

Custom Charts for RAWGraphs

Information Visualisation 2024

Group 1

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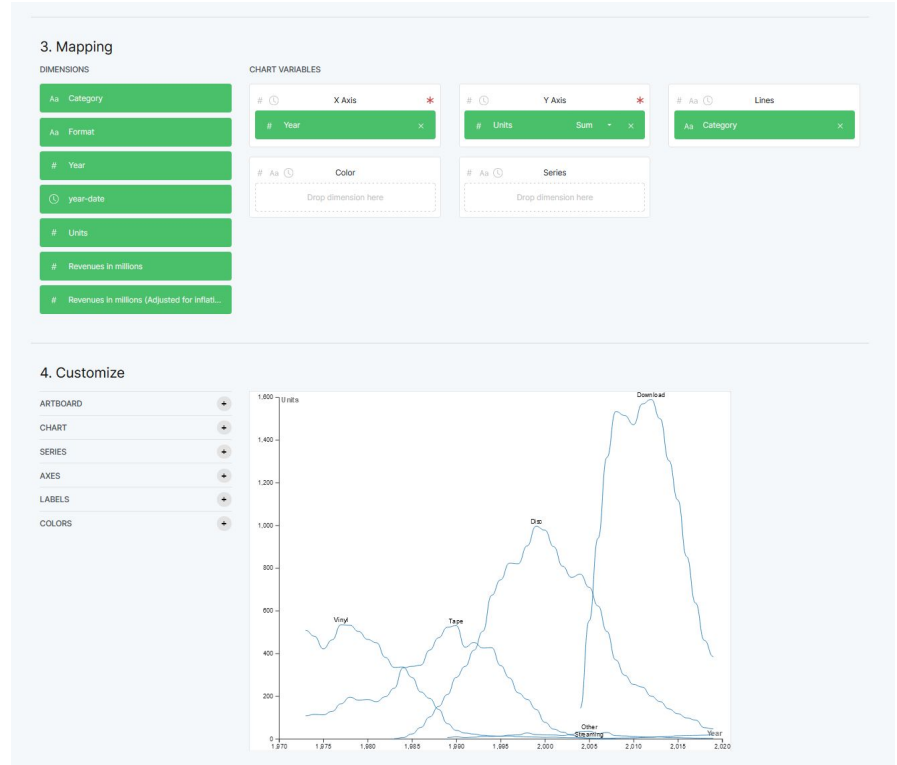
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Agenda

- What is RAWGraphs?
- Custom Charts.
- Similarity Map.
- Connected Scatterplot.
- Polar Area Diagram.
- Limitations and Future Works.

RAWGraphs

- Open source web application.
- Create static SVG visualisations.
- Widely used by non-programmers.
- Developed in React, JavaScript, D3.
- Can be run locally on own server.
- Supports multiple input data types:
 - JSON, CSV, TSV.
- Allows for custom charts.
- Export and save charts.
 - .svg, .png, .jpg
 - .rawgraphs




































RAWGraphs

LIVE DEMO

https://www.youtube.com/watch?v=2TtYlty-M5g&ab_channel=RAWgraphs
<https://youtu.be/vkFAvNgAQzc>

RAWGraphs - Chart Types

 Alluvial Diagram Correlations, proportions	 Arc Diagram Networks	 Bar chart Correlations
 Multi-set bar chart Correlations, proportions	 Stacked bar chart Correlations, proportions	 Beeswarm plot Distributions, time series, proportions
 Box plot Distributions	 Bubble chart Correlations, proportions	 Bumpchart Time series, correlations, proportions
 Calendar heatmap Time chunks, proportions	 Chord Diagram Networks	 Circle Packing Hierarchies, proportions
 Circular dendrogram Hierarchies, proportions	 Contour plot Correlations, distributions	 Convex hull Correlations, proportions
 Linear dendrogram Hierarchies, proportions	 Gantt chart Time series, correlations	 Hexagonal binning Correlations, distributions
 Horizon graph Time series, correlations	 Line chart Time series, correlations	 Matrix Plot Correlations, time series, proportions
 Parallel coordinates Correlations, distributions	 Pie chart Proportions	 Radar Chart Correlations
 Sankey Diagram Networks	 Slope chart Correlations	 Streamgraph (area chart) Time series, correlations, proportions
 Sunburst diagram Hierarchies, proportions	 Treemap Hierarchies, proportions	 Violin plot Distributions
 Voronoi Diagram Correlations	 Treemap (Voronoi) Hierarchies, proportions	 Load custom chart

- 32 native Charts.
- 7 Categories (data types):
 - Correlations.
 - Proportions.
 - Networks.
 - Distributions.
 - Time Series.
 - Time Chunks.
 - Hierarchies.
- Supports custom charts.

Tutorialization and Resources

Guides and Tutorials

- Quick Start Guide
 - `rawgraphs-custom-charts/README.md`
 - <https://github.com/solidth/RAWGraphs-Custom-Charts>

- How to create your Custom Chart Tutorial
 - `rawgraphs-custom-charts/tutorial/tutorial.md`
 - <https://github.com/solidth/RAWGraphs-Custom-Charts/blob/main/tutorial/tutorial.md>

Resources and Permissions

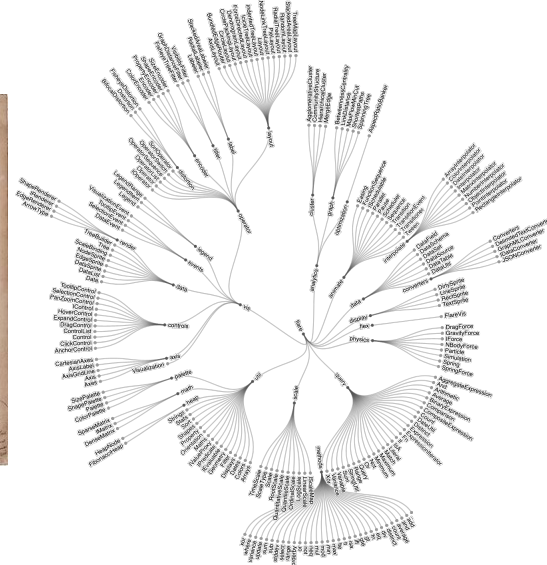
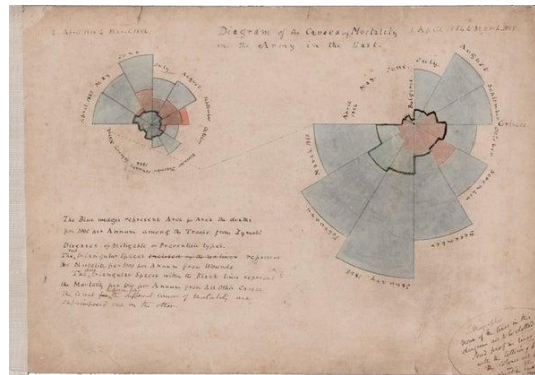
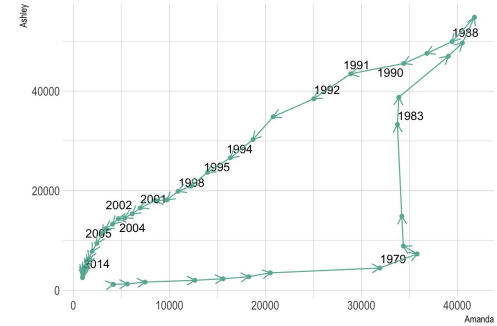
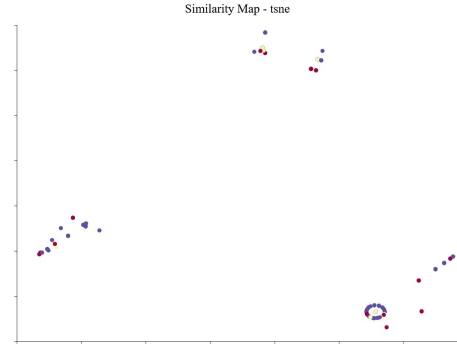
- Code Licences
 - `rawgraphs-custom-charts/licenses/codepermissions.md`
 - <https://github.com/solidth/RAWGraphs-Custom-Charts/blob/main/licenses/codepermissions.md>

- Data Licences
 - `rawgraphs-custom-charts/licenses/datapermissions.md`
 - <https://github.com/solidth/RAWGraphs-Custom-Charts/blob/main/licenses/datapermissions.md>

Custom Charts

Initial Ideas:

1. Similarity Map
2. Connected Scatterplot
3. Polar Area Diagram
4. Radial Cluster Tree



Custom Charts - Testing and Running

Local Sandbox

- rawgraphs-custom-charts
 - <https://github.com/solidth/RAWGraphs-Custom-Charts>
 - Our repository including the three custom charts.
- Git
- Node.js

Local development Server

- rawgraphs-app
 - <https://github.com/rawgraphs/rawgraphs-app>
 - A web interface to create custom vector-based visualizations on top of RAWGraphs core
- rawgraphs-charts
 - <https://github.com/rawgraphs/rawgraphs-charts>
 - A curated selection of charts provided through RAWGraphs interface
- Git
- Node.js
- Yarn

Tutorial

<https://github.com/solidth/RAWGraphs-Custom-Charts/blob/main/tutorial/tutorial.md>

Custom Charts - Folder Structure

chart/

— chart_thumb.svg	chart_thumb.svg SVG thumbnail of the chart on RAWGraphs.
— chart.js	chart.js Main module that ties together all the components of your custom chart.
— chart.svg	chart.svg SVG displayed when selecting your custom chart on RAWGraphs.
— dimensions.js	dimensions.js Configuration of the data dimensions used in the chart.
— index.js	index.js Entry point for chart. Exports the main module of chart.
— mapping.js	mapping.js defines the data mapping rules for your chart.
— metadata.js	metadata.js This file contains metadata about your custom chart.
— render.js	render.js is responsible for rendering of the chart.
└— visualOptions.js	visualOptions.js defines visual options and customization for your chart.

1. Similarity Map

Voronoi Diagram
Correlations

Treemap (Voronoi)
Hierarchies, proportions

Connected Scatterplot
file:11f5ae67e56845ec83614c43ee...
Correlations, proportions, timeseries

Polar Area Diagram
file:11f5ae67e56845ec83614c43ee...
Hierarchies, proportions

Similarity Map
file:11f5ae67e56845ec83614c43ee...
Dimension Reduction, Clustering

+ Load custom chart

4. Customize

ARTBOARD

Width (px) 805

Height (px) 600

Background #FFFFFF

Chart title
Similarity Map - Predict Stude

Margin (top) 50

Margin (right) 50

Margin (bottom) 50

Margin (left) 50

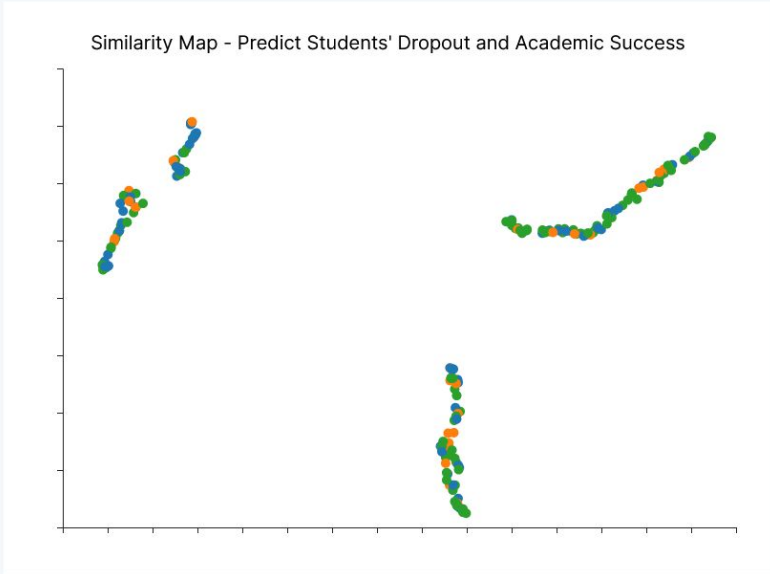
DIMENSIONALITY REDUCTION

Reduction Method UMAP

T-SNE +

CHART +

COLOR +



Similarity Map - Running in Sandbox

- added `src/similaritymap`.
- added `src/styles/base.raw.css`.
- added `src/index.html`:
 - `export { default as similaritymap } from './similaritymap'`
- added `src/tsne.js`.
 - (for later UMAP und PCA)
- added `datasets/fake-multiset.tsv`.
- added `example/configurations/similaritymap-test.js`.
- added `example/configurations/similaritymap-test.js`:
 - `import chart from customcharts/similaritymap`

Similarity Map - Dataset

- Predict Students' Dropout and Academic Success
- <https://archive.ics.uci.edu/dataset/697/predict+students+dropout+and+academic+success>
- This dataset is licensed under a Creative Commons Attribution 4.0 International (CC BY 4.0) license.

Similarity Map - Dimensionality Reduction Techniques

- **t-SNE** - t-distributed Stochastic Neighbor Embedding
 - Very slow compared to other techniques.
- **UMAP** - Uniform Manifold Approximation and Projection
 - similar to t-SNE but significantly faster and better at preserving global structure.
- **PCA** - Principal Component Analysis
 - fast, easy to implement and easy to interpret.

Similarity Map

LIVE DEMO

<https://youtu.be/l-5uqG9lfnA>

2. Connected Scatterplot

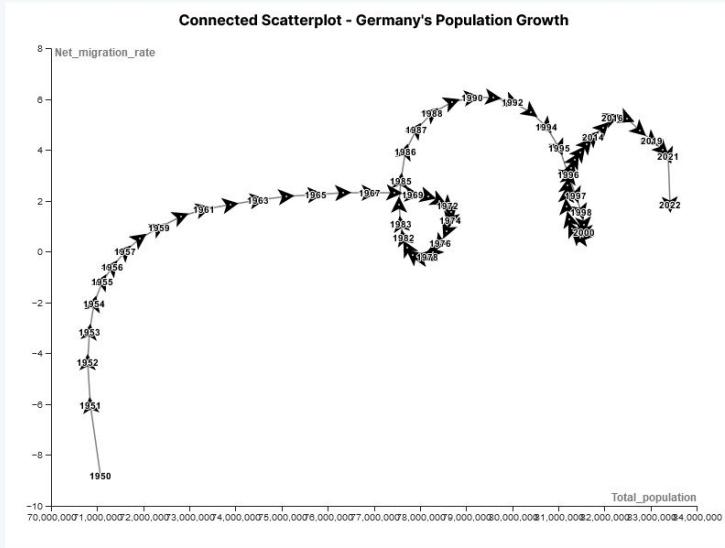
Dashboard menu items:

- Voronoi Diagram: Correlations
- Treemap (Voronoi): Hierarchies, proportions
- Connected Scatterplot: file:11f5ae67e56845ec83614c43ee... Correlations, proportions, timeseries
- Polar Area Diagram: file:11f5ae67e56845ec83614c43ee... Hierarchies, proportions
- Similarity Map: file:11f5ae67e56845ec83614c43ee... Dimension Reduction, Clustering
- + Load custom chart

4. Customize

Customization settings:

- ARTBOARD: +
- CHART: -
- Set X origin to 0: No
- Set Y origin to 0: No
- Max diameter: 15
- Show stroke: No
- Show dots on data values: No
- Dots diameter: 2
- Draw arrows: Yes
- Chart Title: Connected Scatterplot - Gerr
- COLORS: -
- Default: #7ED321
- LABELS: +



Connected Scatterplot - Dataset

- Germany's population growth
- <https://population.un.org/wpp/Download/Standard/MostUsed/>
- This dataset is licensed under a Creative Commons license CC BY 3.0 IGO.

Connected Scatterplot

LIVE DEMO

<https://youtu.be/obWAslwFSLo>

3. Polar Area Diagram

Dashboard showing chart options:

- Voronoi Diagram: Correlations
- Treemap (Voronoi): Hierarchies, proportions
- Connected Scatterplot: file:6835cb141b81efc9acc1e17e00... Correlations, proportions, timeseries
- Polar Area Diagram**: file:6835cb141b81efc9acc1e17e00... Hierarchies, proportions
- Similarity Map: file:6835cb141b81efc9acc1e17e00... Dimension Reduction, Clustering
- + Load custom chart

4. Customize

ARTBOARD

Width (px): 805

Height (px): 600

Background: #FFFFFF

Margin (top): 20

Margin (right): 10

Margin (bottom): 10

Margin (left): 10

Show legend: No

Legend width: 200

CHART

Chart Title

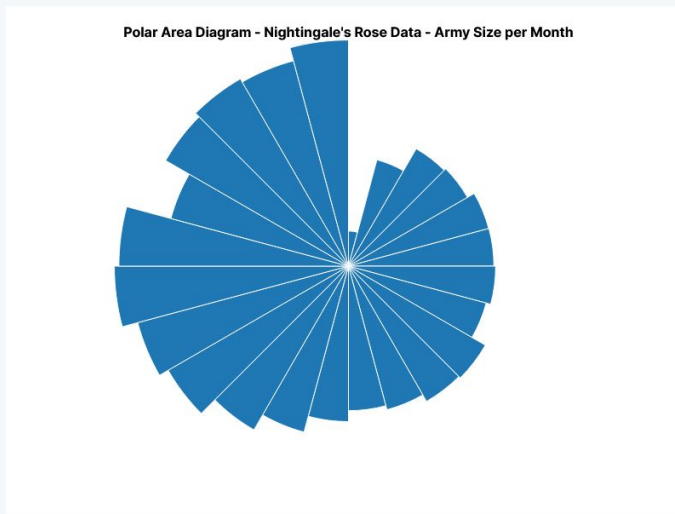
file Data - Army Size per Month

Padding: -2

Rotation: 0

COLORS: +

LABELS: +



Polar Area Diagram - Dataset

- Global Land Temperatures by Country.
- <https://www.kaggle.com/datasets/vijayvvenkitesh/global-land-temperatures-by-country>
- CC0: Public Domain.

Limitations and Future Works

Limitations:

- Disable access to T-SNE options
 - Disabling visual options is only possible for one other option.
 - Disabled if specific setting has specific value (if reductionMethod = "PCA")

Future Works:

- Deploy on Github.pages.
 - Make it publicly available.
- Fix Polar Area Diagram.
- Contact RAWGraphs Team.