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Abstract

Visualizations for the web

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This thesis report describes the implementation of a chart library for use in client-side browser visualizations. The library is completely written in the JavaScript programming language and supports five chart types: bar or column charts, line charts, histograms, scatter plots, and function plots. Function plotting is performed using interval arithmetic resulting in accurate and guaranteed correct function plots with one or two variables. Other charts are drawn according to the guidelines set out in Stephen Few's "Show Me the Numbers: Designing Tables and Graphs to Enlighten" book in order to create clear and consistent visualizations of data.

The design of the library is based on the concept of components and containers which are laid out using layout managers. Three layout managers are included by default: border, grid, and a flexible grid. The charts are drawn using the HTML5 Canvas element and maintain their own transformation stack in order to create crisp lines and shapes. The design of the library also contains several extension mechanism which enables the creation of custom components and chart plug-ins as well as customization of the colours and fonts used in the charts.

The library also extends the JavaScript language by adding support for several functional programming constructs. Examples of these constructs are: functional pattern matching, iterators such as map and reduce, mixins, getter and setter properties, function currying, and others.

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