

VisPaca

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1 Introduction

VisPaca is an information visualization program written in Java using Swing. The main idea of VisPaca is to allow users the ability to select which types of visualizations to display and which data attributes to map to which visual properties.

2 Features

- Loads any CSV file, provided it follows the same syntax as `players.csv`.
- Global filtering of elements based on value ranges.
- Global brushing with two different types of highlights.
- Multiple instances of the same visualization type within the same session.
- No dependencies except for Java 7.
- Table view.
 - Column sorting.
 - Column rearrangement.
- Scatter plot view.
 - Mapping of data attributes to x position, y position, and marker color.
 - Zooming and panning.
 - Element details via tool tips.
 - Multiple elements occupying the same position.
- Parallel coordinate system view.
 - Mapping of data attributes to columns and line color.
 - Suppression and rearrangement of columns
 - Element details via tool tips.
 - Multiple elements occupying the same positions.

3 Usage

To start VisPaca, simply run the executable JAR file `vispaca.jar`. Once VisPaca has started, open a CSV file containing raw data to be visualized via the *File* menu.

3.1 Table View

The first view the user comes across is the Table view. This view simply displays data in the form of a table. The user can sort the data by any of the columns, simply by clicking on any of the column headers. The user can also rearrange columns by dragging the column headers.

3.2 Windows

The user may create any number of instances of views by clicking on the *Window* menu and selecting a visualization. Each instance will be created within a new window. To dismiss a visualization instance, simply close its window. Note that VisPaca will not create any visualization instances unless some data has been loaded. Also note that closing the main window will close the all other windows as well.

3.3 Highlights

Hovering over any of the elements with the mouse cursor will cause the element to be highlighted. To more permanently highlight an element, simply left click on it. To highlight multiple different elements, left click on the element while holding down the *Control* key. VisPaca supports global brushing, meaning that highlighted elements will be highlighted across all views, not just the view the element was highlighted in.

3.4 Scatter view

Scatter views can be created via the *Window* menu. At first, the view will appear to be empty and needs to be configured. Simply right click anywhere in the window to bring up the configuration dialog.

The configuration dialog allows the user to map data attributes to visual properties. It also allows users to set limits to the viewing area via the spinners. For colors, all value below minimum are colored blue while all values above maximum are colored yellow. Values between minimum and maximum will be assigned a color ranging from blue to yellow.

Zooming and panning can be done using the mouse wheel. Scrolling anywhere in the window changes the zoom level while holding down the mouse wheel and moving the cursor pans the view. Zooming or panning on the left-most side of the window allows users to only affect the Y axis. The same is true for the bottom part of the window and the X axis.

3.5 Parallel View

Parallel views can be created via the *Window* menu. Just as with the Scatter view the Parallel view can be configured by right clicking anywhere in the window. The Parallel view does not allow for zooming and panning, but instead allows for selecting and reordering the attributes shown in the view. The color property works in the same manner as in the Scatter view.

3.6 Filtering

VisPaca features a global filtering system which can be found in the *Filter* tab of the main window. Changing the limits within this tab will globally suppress elements depending on their values.

4 Evaluation

This section describes some of the advantages and disadvantages of VisPaca.

4.1 Advantages

- Offers flexibility in what kind of data is visualized.
- Allows the user to configure the visualizations in a way that suits his or her needs.
- Global brushing allows the user to identify elements across multiple views.
- Instant tool tips provide the user with easy access to details about elements.
- The program is easy to extend with new types of visualizations and filters.

4.2 Disadvantages

- Complete lack of visual cues, residue and scent for suppressed elements! Could be solved by implementing, for example, a bargram view or by showing the presence of elements that have been filtered out in some way.
- Manual Window management can be cumbersome, especially if the user has a poor window manager. Other options would have to be explored.
- It may take time to instantiate all visualizations each time data is loaded. Could be solved by supporting the saving and restoring of sessions.
- Supports mainly visualization of numerical data. Could be solved by making the mapping of data attributes more flexible.

5 Example

An example usage of VisPaca could be a user interested in whether or not the frequency of goals and assists increases with the amount of experience a player has. The user would open VisPaca and load the `players.csv` file. Then, the user would open a Scatter view and map the X coordinate to Minutes and the Y coordinate to $(G+A)/90\text{min}$. The user would then be able to see that players with much experience do not necessarily make more goals and assists per game than those with little experience.