Pleiades: Interactive Composing Tools for Vega-Lite Charts

Chanwut Kittivorawong, Manesh Jhawar, Sorawee Porncharoenwase

Abstract— [...need better abstract here...]
Since Vega-Lite is a high-level grammar, the grammar is easy to understand, so the range of users using the software can be from computer science expert to coding beginner. Although users with less JSON experience can work with most of the Vega-Lite easily, View Composition requires a good understanding of tree structure since View Composition can be nested inside each other to create complex views. Beginner users can struggle using this feature.
This software provides a graphical user interface for users to compose Vega-Lite charts. The users can add charts that they want to work with to the software, then they can compose them with layer, concat, repeat, and facet. They can also compose composed chart with one of the four technique. The software also provide warnings when the users are trying to compose charts that are incompatible with each other to avoid unexpected behaviors.

Index Terms—Data Visualization, interactive system, Vega-Lite

1 Introduction

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2 Related Work

Pleiades is built as a tool to help Vega-Lite users easily create multiple views visualization by providing a Graphical User Interface to perform View Composition.

2.1 Vega-Lite: A Grammar of Interactive Graphics

...about Vega-Lite relating to this project... [1].

3 Methods

3.1 User Interface

To work with Pleiades, users can add Vega-Lite specs that they are working with to the left sidebar by clicking "NEW SPEC", then type in the Vega-Lite spec, and save.

To create view composition, users can select view(s) as operand(s) and then apply an operation. It will output the composed view in the main view area. Users are allowed to select up to one view from the sidebar and up to one view from the main view to perform an operation. Users can also perform an operation to composed views. For example, a layered view can then be horizontal concatenated with another view. Then, inside the concatenated views, the right view can be selected to repeat.

To edit composed view, users can select a view in the main view. Then, click "EDIT" configure properties of the selected view.

Pleiades also perform minor validation before committing to any operation to prevent an unexpected output. For example, when the user selects operands to layer, if one of the operands is not a unit spec or layer spec, the "LAYER" button is disabled. And if both operands do not have compatible axes, the "LAYER" button will show a warning sign with tooltip that the axes are not compatible.

Pleiades also provides Inner View Navigator that shows the view from inner spec of repeat or facet view. Repeat and facet operation produces a view containing replication of the operand. When selecting repeat or facet view, the Inner View Navigator shows the original view before the replication. This is useful when the original view is also a composite view. Then, we can select the inner view to edit from the Inner View Navigator.

Finally when the user is done with composing view, they can export to Vega-Lite json file to use normally with any Vega-Lite compiler.

3.2 Operations for View Composition

There are 5 main operations users can do to compose views

3.2.1 Place

When the main view is empty, user can select a view in the sidebar. Then click "PLACE" to place the view to the main view.

3.2.2 Layer

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- *Chanwut Kittivorawong is an undergraduate Computer Science student at the University of Washington. E-mail: chanwutk@cs.washington.edu.*
- *Manesh Jhawar is an undergraduate Computer Science student at the University of Washington. E-mail: mj06@uw.edu.*
- *Sorawee Porncharoenwase is a graduate Computer Science student at the University of Washington. E-mail: sorawee@cs.washington.edu.*

[1] how to do foot note