Tableau Symbol Maps

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For IEEE VisWeek Workshop: From Theory to Practice

Introduction

A key design requirement for Tableau v4.0 was to make it very easy for people to use symbol proportional statistic maps as they worked with their data visually. Prior to v4.0, users had to explicitly add maps as background images, which was a daunting user experience. Furthermore, users typically used map images that were designed for navigation tasks, which contained colors and labels that made it difficult to see the data. This design case study ranges from the appearance of the map images to the general flow of the user experience, including a number of new features that also enhanced all of Tableau's data views.

Map Appearance

We worked with cartographers at Placebase to produce map images that were designed for symbol proportional mapping. Through an iterative design process, we developed a color pallet for the maps that was different than Tableau's color pallet for categorical data. In contrast to navigation maps, political borders needed to be more prominent than road networks. At detailed zooms, the visual appearance of the road network was carefully designed muted. We also worked hard to use a muted color for water and a subtle gradient need maps to create an aesthetic map image the give prominence to the symbol marks (see the attached image).

Halos

When background images were introduced into Tableau, we discovered during development that it was often difficult to see marks when they were rendered on top of images. Our solution was to render marks on top of halos, a rendering of the marks that have been enlarged slight and turned white or black.

Filled & Iconic Shapes

Prior to Tableau v4.0, the shape palette was designed to support the perception of the shape in the presence of overlap:

$$\bigcirc \ \square \ + \ \times \ \ast \ \Diamond \ \triangle \ \triangledown \ \triangleleft \ \triangleright$$

Although halos helped, this palette suffered from saliency issues when it was used on maps. We developed a filled shape that increased saliency on maps while still maintain perception in the presence of overlap:

$$\bullet \ \blacksquare \ + \ \times \ \bigstar \ \blacklozenge \ \blacktriangle \ \blacktriangledown \ \blacktriangleleft \ \blacktriangleright$$

We also added support of iconic marks.

Transparency

Unlike filled maps, symbol maps often have marks that overlap, which can make it difficult to understand the data. We added transparency to the Tableau rendering mechanism to resolve this issue – and we believe the combination of symbol maps and transparency makes them more effective than filled maps for many situations. The transparency feature also allows users to create density plots, which is a well-known technique for showing distributions in scatter views. Finally, we added a transparency slider o give the user the ability it adjust the relative saliency of data marks and map features – the user can decide whether to emphasis the marks or the locations of the marks

Increased size ranges

We increased the size ranges in Tableau to provide large marks on maps. An interesting design issue was the treatment of size ranges for bar view. For bar views the size range was limited to maximum area for the bar because bar overlap can be very confusing.

Small-multiple maps

The Tableau user interface and VizQL formalism support the creation of small-multiple views. Before v4.0, a zoom request in a small-multiple pane also filtered to that pane. With small-multiple maps we changed this to keep all the views so that users could easily focus on all the data for a particular area on the map.

Aspect ratio and projections

Maps include interesting issues around aspect ratios and projections. For map views, we maintain a 1:1 aspect ratio and fill with additional map images. For projection, we extended our rendering mechanism

Color for data fills

The online map provider for Tableau images includes the ability to include filled areas, which involved additional color design issues.

Automatic geocoding

The final feature was the ability to generate symbol proportional maps for data sets that did not contain latitude and longitude even though they contained fields with geographic semantics. Tableau v4.0 ships with geocoding tables for common political areas and a simple user experience for indicating the geographic semantics of a field.

Map of donations to the 2008 presidential campaign by Zip Code and Candidate. Data is current to April 1, 2008 and was provided by the Federal Election Committee via their public website.