Exploration of National Park Recreation

CS-5630 / CS-6630 Visualization Final Project - 2015

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1. Overview and Motivation

Provide an overview of the project goals and the motivation for it. Consider that this will be read by people who did not see your project proposal.

Our project aims to allow users who may not have much knowledge about the National Park System in the United States of America explore information about them in a much more detailed and interactive manner than is possible with normal website or piece of written text.

The project was spawned by Hadeel's feeling that there are many interesting features to explore in places such as the national Parks in Utah but that people from other countries or states may not know about these things without some kind of introduction. From this came the desire to allow users to explore this information on their own but also guide them in a way, allowing them to explore without feeling lost.

2. Related Work

Anything that inspired you, such as a paper, a web site, visualizations we discussed in class, etc.

When we were thinking of an idea for the project, we decided to implement a unique one also attractive to people in the same time. However, our choices of visualizing the project idea were mostly based on the theory presented in class. Our project focuses mainly on showing comparisons, thus, we were careful by choosing the tools and charts types that meet these purposes by making use of the Visualization principles.

We were also inspired by the examples in the official website of d3 library.

3. Questions

What questions are you trying to answer? How did these questions evolve over the course of the project? What new questions did you consider in the course of your analysis?

Through our visualization, specifically through the interactions, we help users answer questions about the national parks such as popularity, what times are best to visit, which are most crowded and which are not, and popularity of activities types for each park. Moreover, our visualization should show how the nature tourism was grown through the last three decades.

4. Data

Source, scraping method, cleanup, etc.

A majority of our data about the national parks was procured directly from the National Parks Service website through their data gathering initiatives. The National Parks Service makes a number of important pieces of information available to the general public.

During the process of drawing the parks nodes, we found bugs in the source of national parks boundaries data, so we had to collect other resources to draw the parks on the map. We could parse the locations of parks, parks info, and land area from Wikipedia source. Facebook likes data were parsed directly from the National Parks Service website.

5. Exploratory Data Analysis

What visualizations did you use to initially look at your data? What insights did you gain? How did these insights inform your design?

Our initial explorations took only a few forms. First was the data output by the parsing programs in python. Using these it was actually pretty apparent just from outputting the JSON structures that there were cycles in the months that had more visitors attending various parks in the middle months of the year as compared to the winter months.

By only drawing the parks nodes on the map, we could notice the differences between the parks by their area land, and Facebook likes through the nodes sizes. And by tracking the bar chart updates when moving the years slider left or right, it's obvious which are popular through the years, and which are old. This gives us the indication of the success of our design. However, we need monthly comparison to show which seasons had more visitors attending through the years.

Our next exploration was the use of the bubble chart which was something that allowed us to get a comparison in some of the park's activities but it did not give us concrete values to compare parks to each other.

Overall, thus far in our process we have gained insight into the fact that we want to make sure the minimum sizes of the circles in the bubble chart for example, have a higher minimum size to ensure they are easier to interact with.

6. Design Evolution

What are the different visualizations you considered? Justify the design decisions you made using the perceptual and design principles you learned in the course. Did you deviate from your proposal?

We considered several designs but nothing too wildly different from what we actually settled on in the end. We felt that the map was the best way to give the locations of national parks to the user to show where they are, in the end we felt that this was something that uniquely required a map.

We considered several ways of displaying data for comparative purposes, mostly bar charts with some exploration of line plots as well. In the end we decided to incorporate some feedback from our consultation team session and decided that we could use stacked bars for some direct comparisons and having unique data for a specific park fleshed out more so in the bubble chart alone. We felt like the bar chart is one of the strongest ways to display data in comparison thanks to the length and position on a common scale being such strong indicators for the viewer.

Our bubble chart was chosen because we felt like the bubbles can easily map to categorical data by positioning the bubbles separately and coloring them for a redundant encoding of the categories. Finally, we felt like a bubble chart is good when focusing on one park as opposed to several and allows the user to roughly compare some of the activities we are tracking from each park in a given month. Since we felt the internal comparison was a good aspect, we also opted to label with numeric values, each of the bubbles. Interactivity in the bubble chart helps to draw the user in and we plan to connect this interactivity into displaying information elsewhere on the page.

We did not deviate from our proposal and have moved forward with the designs based directly on the ideas we presented therein.

7. Implementation

Describe the intent and functionality of the interactive visualizations you implemented. Provide clear and well-referenced images showing the key design and interaction elements.

<TODO: add images>

One of our first forms of interactivity are the button bank allowing the user to size the map markers for the various parks according to different criteria. This will be a simple interaction form that can relay information in a relative sense. (As of the milestone this is partially implemented)

Our bubble chart now has interactivity to select and highlight a specific selected bubble via repositioning it to the center. Using this, we plan to allow the user to explore descriptions of various activities or perhaps compare the counts of this activity to other parks. (As of the milestone this is partially implemented)

8. Evaluation

What did you learn about the data by using your visualizations? How did you answer your questions? How well does your visualization work, and how could you further improve it?

<TODO: evaluate>