The Complete history of bids of Olympic Games

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Repository URL: https://github.com/VanillaCola/OlympicsBids
Project URL: https://vanillacola.github.io/OlympicsBids/

Overview and Motivation

The summer Olympic Game or the Game of the Olympiad is the largest international multi-sport event. The first summer Olympic Game was held in 1896 at Athens, Greece then hosted by a different city every four years. Hosting an Olympic Game oftentimes requires the host city to build new stadiums, expand mass transit system and renovate the public facilities. All these will bring challenges as well as tremendous development opportunities to the host cities, such as creating new jobs, receiving financial investments and attracting global attentions. Due to the tremendous opportunities and benefits of hosting an Olympic Games, the major cities that are interested in hosting the game need to bid for it and rival for the hosting right. For example, 12 major cities around the world bid for the hosting right of 1936 Olympic Game and eventually Berlin, Germany was selected as the host city.

People tend to only pay attention to the host city and the game itself. For example, everyone knows that Rio hosted the 2016 summer Olympic Game; but probably only few people know that Chicago was also one of the candidate cities that bid for this game. Certainly this bidding process is an essential component of Olympic Games but often time overlooked by many people.

We therefore attempt to present the data for Olympic Game bid using interactive visualization techniques. This project can help people to have more comprehensive understanding of the Olympic Game.

The source webpages (https://en.wikipedia.org/wiki/List_of_bids_for_the_Summer_Olympics) contain tables that tabulate the candidate city information for each game. However, the table is not interactive and lacks appropriate aggregate information. We will extract the data from the source

Overview and Motivation

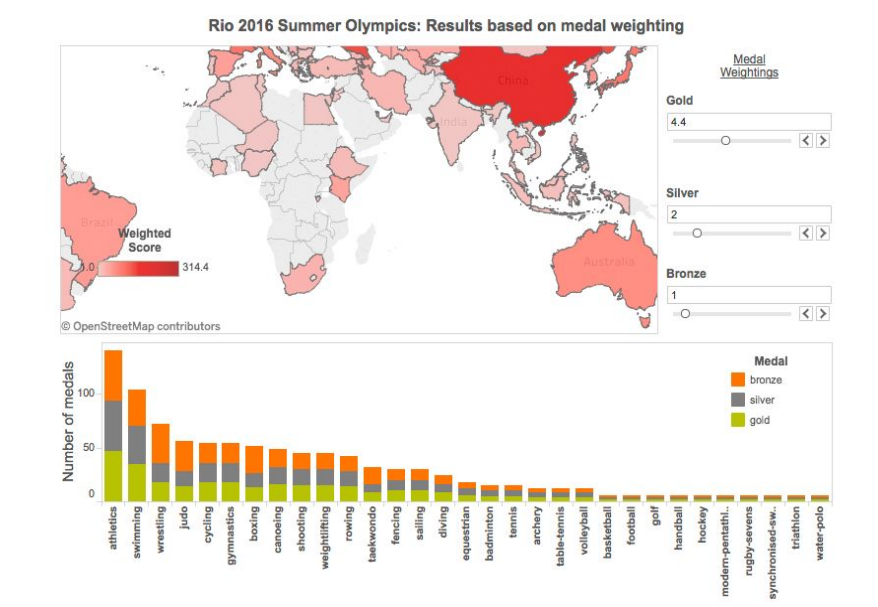
webpages and visualize it using interactive techniques, including map and stack bar chart. For each summer Olympic Game, our design will interactively display the candidate city names, exhibit their geographic locations on the map, how many times they participated in the bids and how many times they won the hosting right, as well as some other well-designed aggregate information. We will also color the cities based on their continental location and our implementation will contain the option to zoom in on the world map to show each individual continent and country.

Related Work

We searched online for the related work in the hope of getting some inspirations. We came across the following well-designed visualizations and believed that some of their visual elements are effective so we plan to apply similar techniques in our implementation.

Related Work

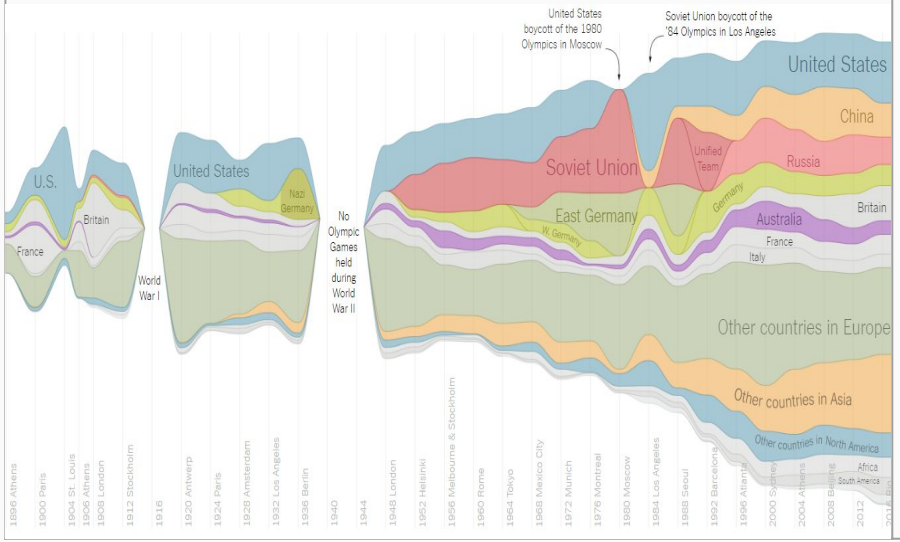
1. https://srcole.github.io/2016/08/17/olympics/



This work attempts to visualize the medal distribution among countries. They used the world map to illustrate the geographic location of different countries. Our data have many cities and the best way to visualize their geographic data will also be using the map. In the bottom panel they used a stack chart to show the medal distribution. It is concise yet conveying information effectively. We will also consider using such chart in our design for showing some aggregate information.

Related Work

2.http://www.nytimes.com/interactive/2016/08/08/sports/olympics/history-olympic-dominance-charts.html



This work gives us idea of how to visualize the data using a series of time points. We will attempt to keep track of how the Olympic Games candidate cities change over time and we can certainly utilize the similar technique in our bar chart.

Questions

Initially we want to build a project that will help answer the following questions:

1. **How many cities participated the bids for each summer Olympic Game and what/where are they?**
2. **For each city that participated in the bids for Olympic Game, has it ever won the hosting right? How many times did it fail before won the right to host the game? What is the success rate?**
3. **What is the geographic distribution of the candidate cities? Which continent has more candidate cities?**

These questions are the key questions to answer and remain as our highest priorities. Our visual implementations will focus on these questions and we will keep polishing our designs in order to provide the clearest answers.

In our initial design we proposed to utilize a pie chart to show the participation ratio between different continents. In our later implementation we found out that the pie chart is not very effective in conveying the quantitative information. We eventually decided to change our implementation to use a bar chart. In the pie chart we are relying on area as the visual element to convey the quantitative information; whereas stack chart uses length as the visual element. Length is, in general, a more effective visual element.

After implementing the stacking bar chart to show the participation ratio

Questions

between different continents for one year we further asked: what if the users want to compare the participation ratio across several years? In order to answer this question we further implemented a brushing feature for the x-axis (game year). Namely, if the user wants to compare the participant cities from different continents across several years, they can use the brushing selection window to select several years from the x-axis and the aggregate information based on the selected years will be visualized on the stack chart. We further implemented a feature that will highlight all the target cities on the world map when the mouse hovers over the corresponding continent rectangle on the stack chart.

Data

Our raw data were taken from wikipedia:

- https://en.wikipedia.org/wiki/List_of_bids_for_the_Summer_Olympics
  The data contained therein are presented as some HTML tables. We used Google Spreadsheet [1] to scrape the tabulated data. The cities coordinates hasn't been provided from the original data, we appended each candidate city with an associated longitude and latitude.

Our map data were taken from the following source:

- https://gist.githubusercontent.com/abenrob/787723ca91772591b47e/raw/8a7f176072d508218e120773943b595c998991be/world-50m.json, we directly downloaded it and load the data as part of our implementation.

Exploratory Data Analysis

In our stacked bar chart, each rectangle in the bar chart represents a candidate city that participated the competition in a particular year; in our initial design every rectangle has the same shape and size since we only considered to display cities. However, this will make it difficult to differentiate the host city and other candidate cities. We did categorize the cities into different color based on the continent where they belong, this does not reflect the winning city/continent in that particular year. We therefore decided to highlight the host city by scale up the size of the rectangle for the host city in our later design and this will certainly help the users gain the insight of the data.

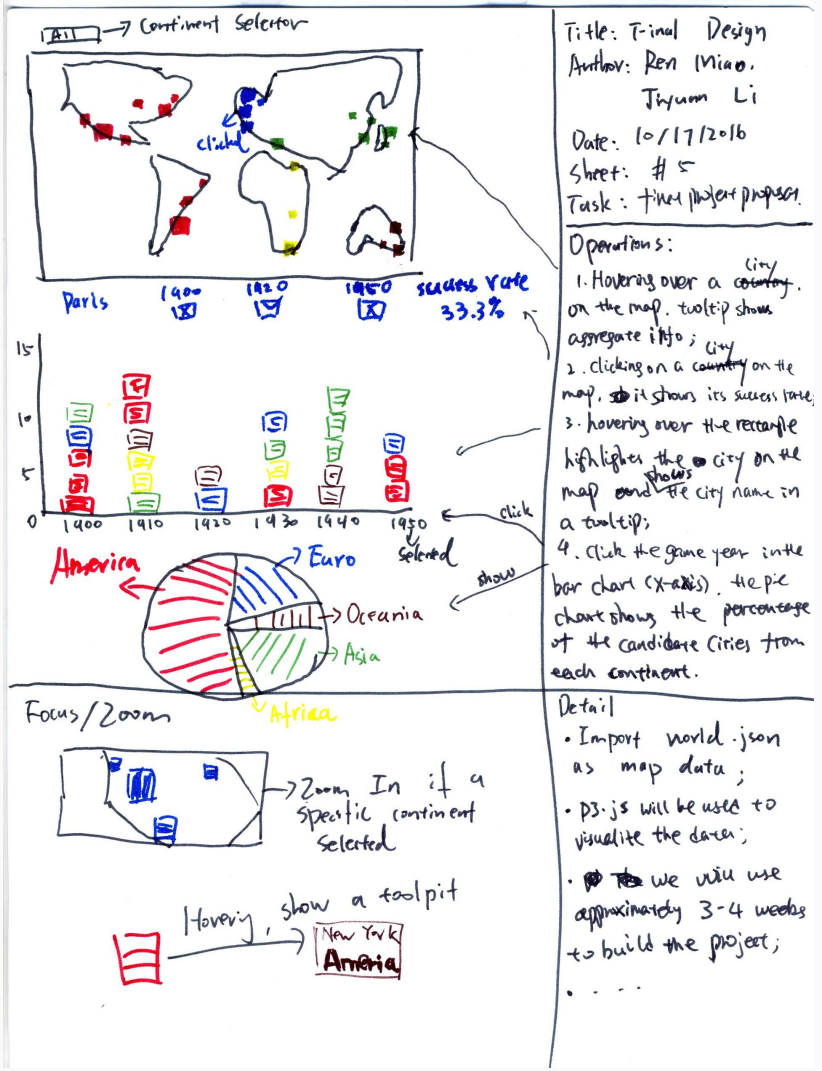
Design Evaluation

In our initial design we proposed to utilize a pie chart to show the participation ratio between different continents.
In our initial attempt we first implemented the pie chart but quickly found out that the pie chart is not very effective in presenting the quantitative data. After discussion we decided to change our implementation to use a stack chart instead. This is because that the visual encoding used in the stack chart is length whereas the visual element used in the pie chart is area. According to the Steven's Psychophysical Power Law, the perceived sensation of length has a linear response (slope = 1) to the physical intensity whereas area has a much worse response (slope = 0.7). Therefore length is the best visual channel for conveying the quantitative information. Our choice of implementation (using stack chart instead of pie chart) used the best visual channel.

Implementation

When the webpage is loaded it will show two major visual components: the world map and the bar chart, which are shown below.

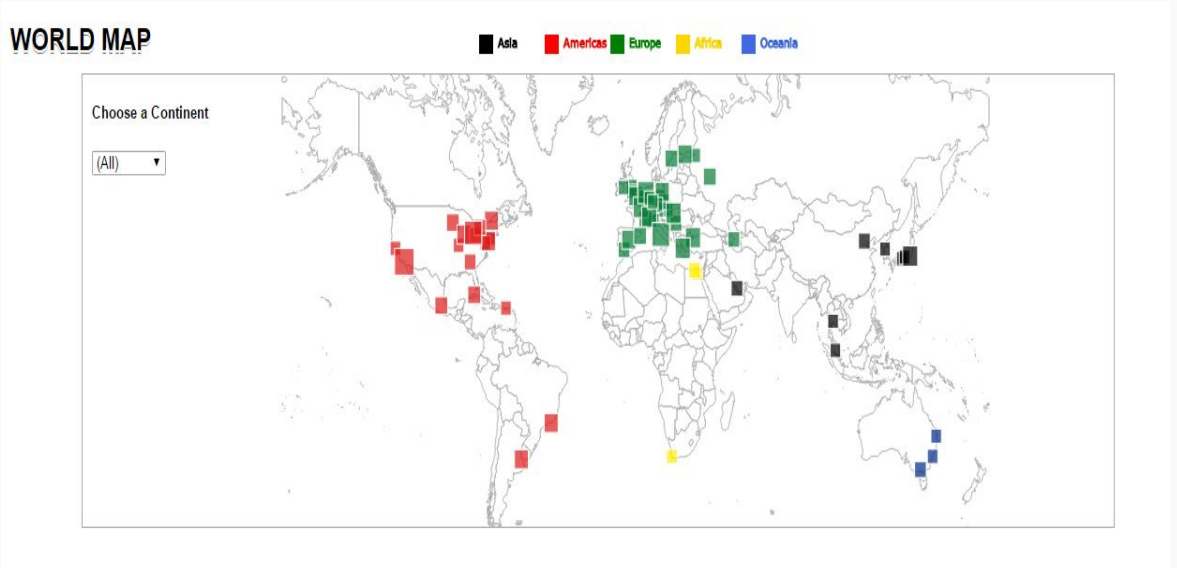
Our project includes two major visualizations, each of them yields a quick summary of a specific component from the visualization. Some well-designed interactive features have been implemented between these two components as well.



World Map

The map visualizes the cities which ever participated in the bids for summer olympic games. They has been classified into 5 categories based on their geo-location provided from the dataset, including the continents they belong to.

The size of the rectangle is dependent on the number of times this candidate city participated. The more bids this city participated in, the larger this rectangle will be. We used size to represent the quantitative data is one of the most effective design choice for encoding the data according to the course materials we learned. The colors we used to distinguish the continents are also effective, so the users can quickly realize the continent to which the target city belongs.



World Map

The implementation steps are as follows:

1. Loading the world-50m.json to depict the world map
2. Reading data from Map_candidate_cities_data.csv, place the cities as rectangles on the map using their longitude and latitude attributes; the size of the rectangle is dependent on the count of participation this city has.
3. Coloring the rectangles
4. Zooming-in the specific continent using the continent selector (see details below)
5. Clicking on the country to zoom-in to the individual country (see details below)
6. Hovering on the city pops up a tooltip showing the number of time this city participated in bids (see details below)
7. Clicking on the city (rectangle) shows a summary of this city (see details below)

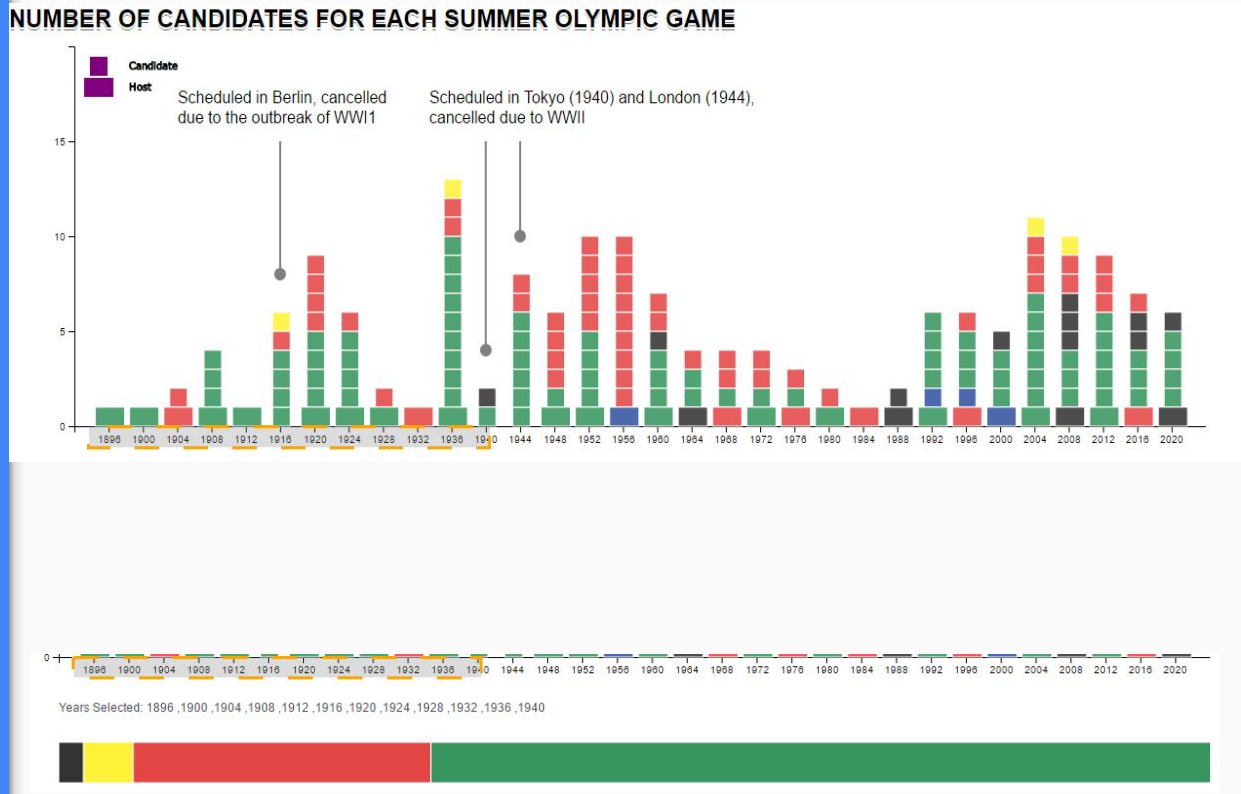
Number of Candidates for each summer Olympic Games

The stack bar chart below illustrates the history bids and the number of candidates for each summer Olympic Games over the years.

X-axis: The years of Olympic Games

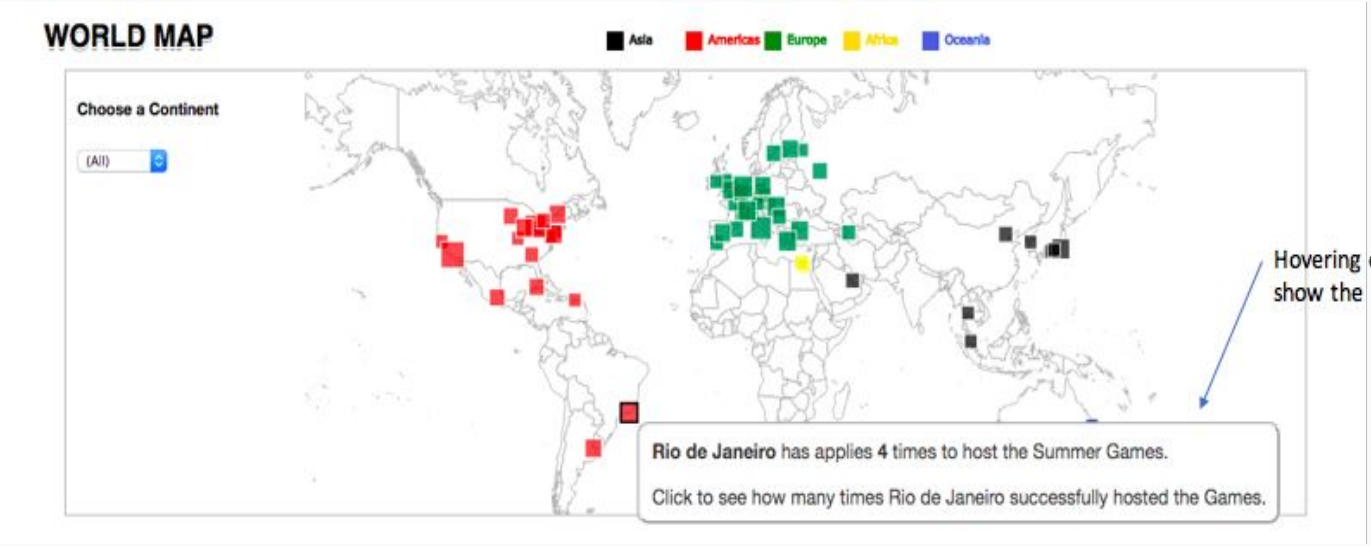
Y-axis: the number of cities participated in this specific year

Hosting cities and candidate cities has been indicated in the chart. A hosting city's rectangle is at the bottom and has a larger width than a candidate city's. There are three games labeled on the map that has no host city, due to the World War I and II.



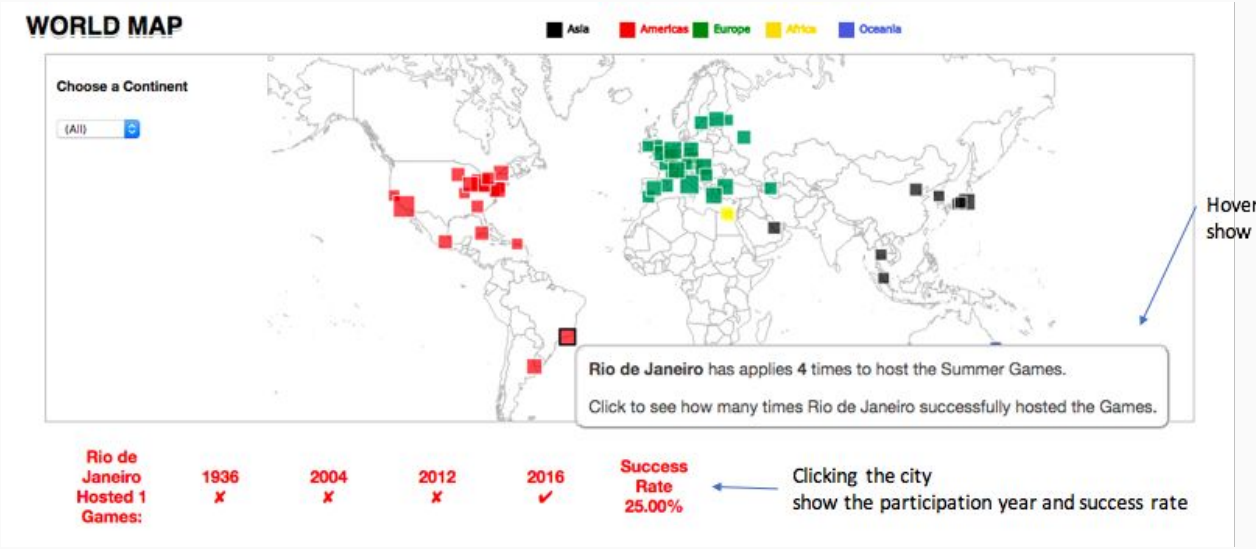
Interactive Visualization Features

1. Hovering over the rectangles in the map will show the specific information of this particular city. For example, how many time did this city participate for hosting Olympic Games?



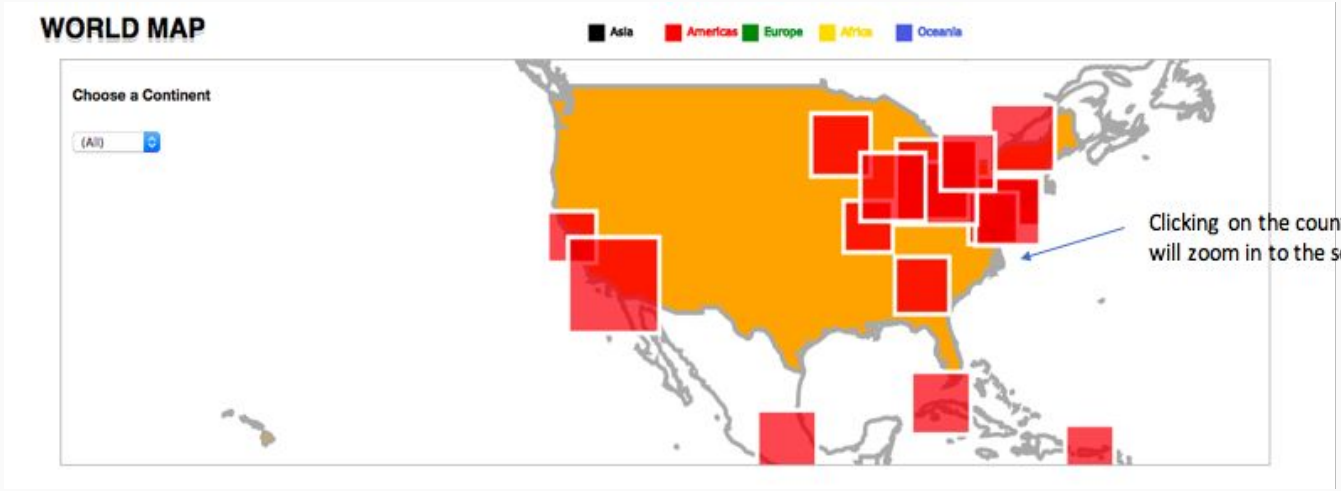
Interactive Visualization Features

2. Clicking on the rectangles on the map will pop-up a summary result of this city, including year this city participated in bid and which year this city won the bid?



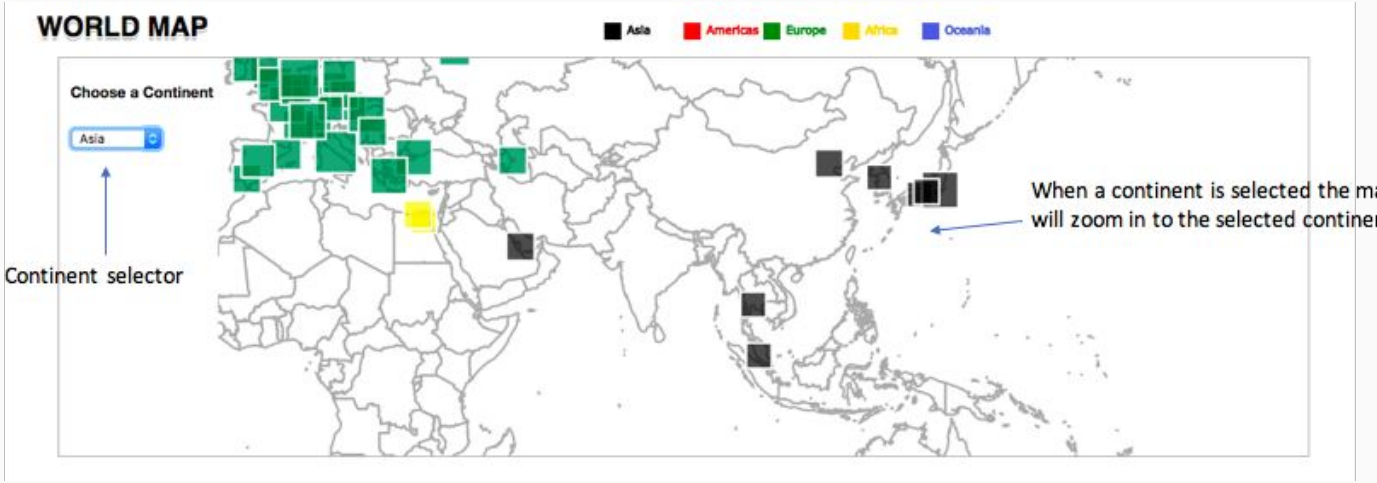
Interactive Visualization Features

3. Clicking on a country will highlight the selected country and zoom in to show the enlarged country map. This feature will help the users to gain more insights into the country-specific information, such as how many cities within a country ever participated in the Olympic game bid.



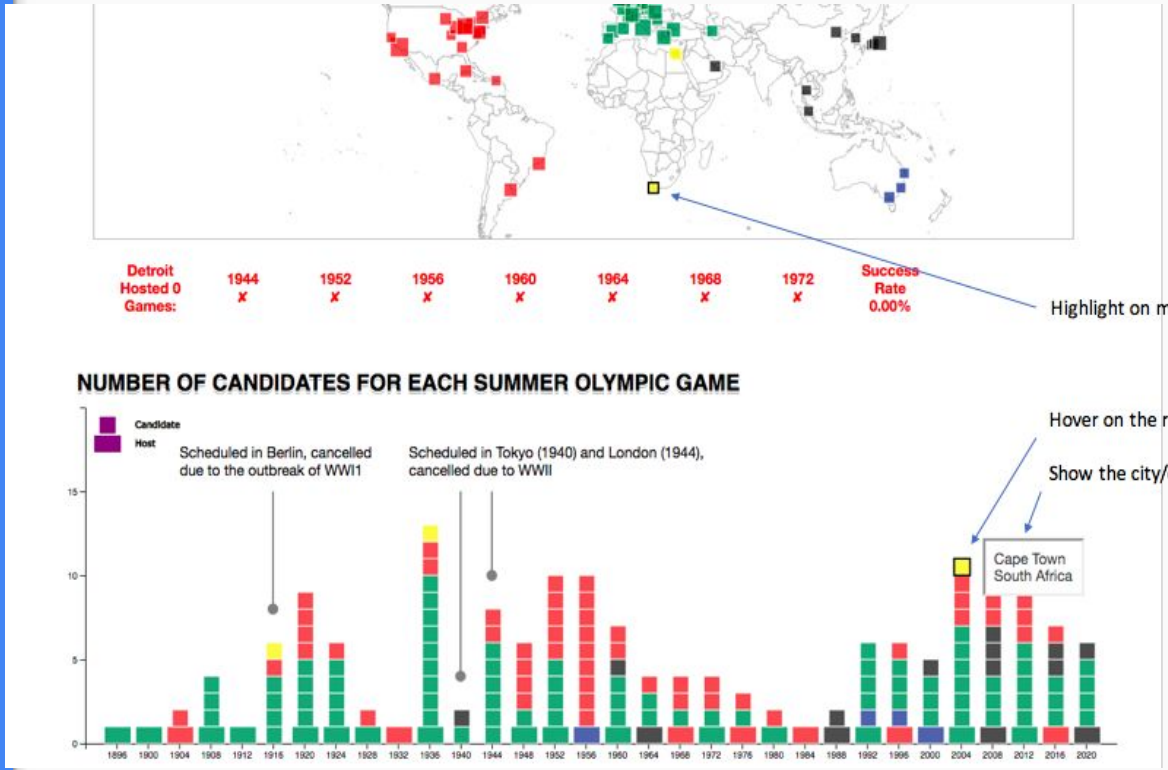
Interactive Visualization Features

4. The users can select a continent from the continent selector. Once a continent is selected the map will zoom in to the selected continent and show an enlarged map. This feature will help the users to gain more insights into the continent-specific information, such as how many cities within a country ever participated in the Olympic game bid.



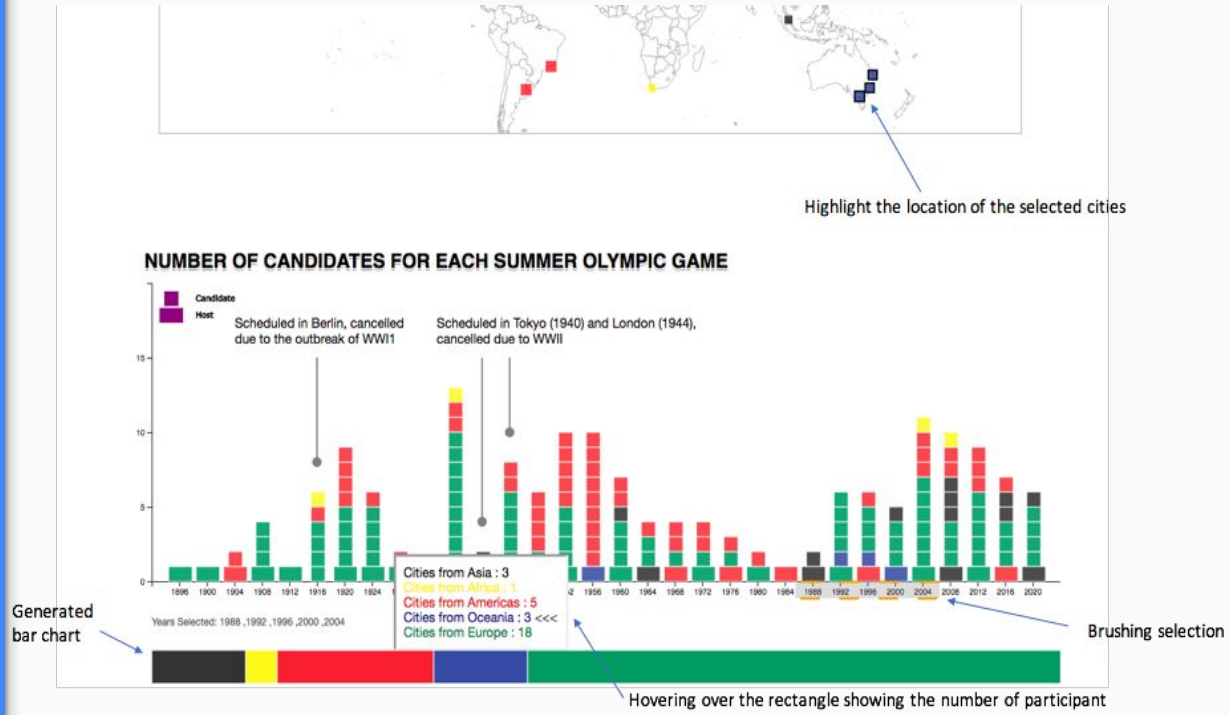
Interactive Visualization Features

5. Hovering over the rectangle in the bar chart will show the name of the corresponding city and the country in which the city is located. Also the geographic location on the world map will be highlighted.



Interactive Visualization Features

6. The user can select multiple years from the x-axis and the corresponding aggregate information will be visualized in the newly-generated stack bar chart below. The new chart compares the number of cities participating in the bid for the selected years. Hovering over the rectangles will show the aggregate information (the number of participant cities) and these cities will be highlighted in the world map.



Evaluation

There are several facts we can readily learn from the data using our visualizations.

1. Europe and Americas hosted much more Olympic Games than other continents in the history.
2. Summer Olympic Games have never been hosted in a “chill” place.
3. Seoul participated only once in bid for Olympic Games and won the hosting right.

Possible future improvements:

1. Some countries are difficult to click since they are hidden by the rectangles drawn on the map. Implementing a scrolling feature to control zoom-in/zoom-out may be a better design choice.
2. The color used for rectangles from the map and the bar chart are not entirely consistent even though we made them as same class.

With our interactive visualization the users can now readily gain insights into the data by moving and clicking the mouse instead of staring at the table for long time. Our implementation provides an intuitive and easy-to-understand way for the users to have a complete understanding of the history of the bids for Olympic Games.