

CS 416 Data Visualization (Summer 2024)

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Narrative Visualization: [Olympic Games Visualization \(gibsatron.github.io\)](https://gibsatron.github.io)

Data Source (public): [120 years of Olympic history: athletes and results \(kaggle.com\)](https://www.kaggle.com/datasets/ashleythornley/olympic-history)

## **Messaging**

This narrative visualization examines the success and participation of various countries in the Olympic Games over 120 years amongst multiple sports. It highlights key metrics such as the number of participants, the number of gold medals, total medals, the percentage of female participation, and the number of medals won in specific sports. The primary message is to showcase that the United States have consistently outperformed all other countries in the Olympic Games since its inception, illustrating their sustained investment dedication across a wide range of sports as well as the incredible talent of their athletes. Although there is a focus on the United States, an overarching message is to showcase the trends and disparities in Olympic performance among countries, highlighting gender participation and specialization in specific sports.

## **Narrative Structure**

The narrative visualization follows the interactive slide show structure. The user can navigate through the slides using the buttons at the top middle of the visualization. The buttons are numerically labelled to indicate its order. For each slide when accessed through this button mechanism, the visualization parameters will have preconfigured, or default, parameters that are relevant to the overall message. Within each slide, the user can interact with the data by modifying the scene parameters such as scrolling through the years of each Olympic Game and using a region or sports filter. Likewise, the user can gain additional insights/information about each country by activating the tool tips when they hover over a marker corresponding to a particular country. Thus, the user can explore details within each scene while maintaining a guided narrative.

## **Visual Structure**

Each scene uses a scatter plot for visual consistency with labeled axes and color coding of markers to represent different geographical regions. The labeled axes and plots ensure the user can easily interpret the data, and the color-coding allows for quick visual differentiation of markers without being overwhelming (like if it was color-coded by country). Scatter plots are a familiar structure for the quantitative data visualized in multiple dimensions. The United States marker is always annotated to highlight for the user where to bring their attention as its usually an outlier in terms of Olympic Game success and participation. Likewise, the annotation includes a quick summary of the United States metrics being focused upon in each scene to quickly reorient the user to the difference between each

scene's chart data. With the United States annotated, when changing scenes or modifying parameters, the user can easily track the movement of that marker in the updated visualization. Consequently, they can slide through each year of the games and see how the United States metrics change over time. More information about the data and filters are included in the description to the right to further aid the user in navigating and understanding the narrative visualization. Furthermore, the x-axis is always the same dimension, number of participants, across all scenes. This keeps the user oriented and helps them connect the data to other scenes as a reference point is maintained as the y-axis is changed depending on the scene state.

## **Scenes**

There scenes are the ordered slides of the visualization narrative. The first scene shows the number of gold medals won versus number of participants with all regions (and countries) included in the filter and 2016 (the last year recorded in the dataset) as the default year parameter value. 2016 was chosen as it's the most recent Olympic Games in the dataset and would be most relevant to someone interested in understanding the current state of the Games and each country's success. If the user is interested, they can move the year parameter slider to see the United States participation and gold medals won throughout time, further strengthening the realization of United States consistent and significant wins in each Olympic Game. The following slides looks at more specific metrics: female participation and total medals won by sport. Female participation has steadily increased over the years and provide a means for United States to gain more success and participation within the Olympic Games. It shows the progress and gaps in female representation in the Olympics for the United States and fellow countries. In both scenes, all regions are selected and 2016 is the default parameter setting for year. However, for the total medals won by sport scene, gymnastics is the default parameter setting for the sport because it's a very popular sport in audience and athlete engagement. Therefore, the user can see that the United States holds dominion in most sport powerhouses that garner the most views and acclaim for their athletes. If the user wants to know how the United States or other countries performed in other sports, they can change the sports filter. This will allow the user to compare other sports and draw their own insights which may lead to solidifying the message of United States success in the games. Accordingly, the scenes are ordered from a more general overview to more targeted and specific views.

## **Annotations**

The annotations were used to highlight and bring attention to the United States and where it places in terms of number of athletes, number of medals won, and female participation versus other countries. The call out template was followed for the annotations as a label was placed above the marker for United States. The text also provided context for the data point for that scene's chart such as model efficiency, number of medals won, or female participation. This supported the messaging because the user could pinpoint the location of the United States in relation to other countries and get a concise snapshot of the metrics being explored in the current scene. The annotations partly change within a single scene. The USA label stays the same as well as the metric shown but the value of the metric changes depending on the year or sport chosen (for the final scene) if the user chooses to explore this

parameter setting. Thus, the user can see and understand how the USA has performed in the Olympic Games throughout the years and in various sports.

### **Parameters**

The parameters of the narrative visualization are the y-axis, year, region, and sport. The y-axis parameter is not available to the user to modify but does define the state of the visualization as each y-axis parameter is associated with a particular scene. The filters available in all scenes are year and region for showing countries according to the year of the Olympic Games and geographical region. The sport filter is only available in the third scene, and the default parameter setting is gymnastics. Each state of the narrative visualization is entered by clicking the respective scene's button (1, 2, or 3) or restarting/initializing the visualization (which defaults to scene 1). The state of the narrative visualization is defined by the parameters set, where scene 1 uses number of gold medals won across all regions and sports, scene 2 uses female participation across all regions and sports, and scene 3 uses number of medals won across one particular sport (gymnastics) and all regions. Each state has 2016 as the default year parameter setting. When diving deep into a scene, the parameters year, region, and sport for scene 3 can be altered to enter a non-scene state. To reenter a state, the scene buttons above can be clicked.

### **Triggers**

The triggers that connect user actions to changes of state in the narrative visualization are the year slider, region checkboxes, and sports dropdown. These triggers were implemented through event listeners that update the visualization's state based upon user input. Each control is clearly labeled with the option being selected displayed. For the year filter, a slider was used to indicate only one year can be selected but they are sequential and can be scrolled through to see the data over time. For the region, checkboxes are used to indicate that multiple options can be selected simultaneously. For the sports filter, a dropdown menu was utilized to communicate that only one option can be selected at a time and allow for searching within the list of sports because there are many.