Project1 Report

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1 Introduction

1.1 The Paper

The name of the paper I worked on: Exploring Music Rankings with Interactive Visualization. [1]

1.2 Scope of the project

This paper used music data set, analyzed the results with four different techniques: Sunburst, Node-Link Tree, Bubble Chart and Treemap, all being able to represent music data content and music genre. In order to find and compare music rankings as well as display music attributes, this paper presented an interactive way to visualize the music data.

When I re-implement this paper, considering the difficulty of the data resource, I decide to use movie data instead. For these four techniques, I re-implement a simple version. I provide basic information of data, include genre and score. Additionally, I draw a collapsible indented tree with the help of D3.

In the paper, the user could add their own music data into the system and then visualize in these techniques. However, this function does not accomplish in my project.

1.3 Outline

This report includes all the detail and discussion about the re-implement project. The first section gives a general idea about the project. Then the Process section will provide the progress of development, and the Result section shows the final implementation. Then the Discussion contains the problems I faced in the development and how I solve them. Finally, if I have more time to optimize, I will follow the idea of Future Work section.
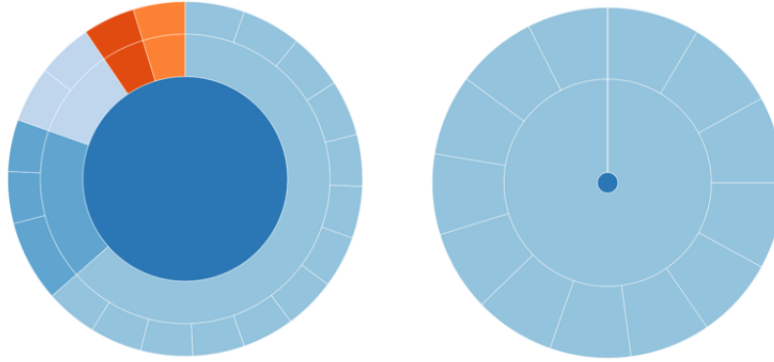
Figure 1: Zoomable Sunburst

2 Process

2.1 Get the data

When I started this project, the datasets became the most important resource that I need to get. Firstly, I tried to download the specific music rank data from Spotify and iTunes. But there is a big problem that I could not map the genre to each music. What I could get is only the music name, artist and some basic information. So I give up using this dataset. Thanks to professor Alark's help, I could easily get the JSON data from 'The Movie Database'. Then, this project would use movie and movie genre as the data. Then I need to convert the original data to a hierarchical data structure.

2.2 Sunburst

The first technique I implement is the Sunburst. After reading the demo from the D3 gallery, I implement a sunburst test without text. And the text is really significant to this project. In order to display the text correctly, I test a lot of parameters. However, there are still some overlap and incomplete problems happen. I tried zoomable sunburst diagram as showed in 1, but this dataset is small, and it's a challenge that adds text correctly, so I choose to highlight the slice when clicking it.

2.3 Node Link diagram

Then I start to implement a node-link diagram. The progress is much faster than Sunburst, and it's easier to implement.

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2.4 Treemap

And then the treemap diagram.

2.5 Bubble Chart

The bubble chart is similar to the above diagram. And do not care much about the hierarchical structures.

2.6 Main Page

When I implement those four HTML files, I realize that I need to merge these techniques together into one page. I take one template of the website: 'https://startbootstrap.com/' which TA provided. Then I take the screenshot and add those pages to the main page.

2.7 Collapsible Indented Tree

Fortunately, once I noticed another technique called collapsible indented tree, and I think this is useful for this project, so I read the demo and implement these techniques with our data.

3 Result

We could see each parts in the following figure: 2 3 4 5 6 7.

4 Discussion

1. Most of these techniques, the size of each element represents its score. In the dataset, top-rated movie, have similar scores, which means it's hard to tell which is better than the other. But if the dataset expands with more movie, it would be more comparable within the diagram.

2. The interactive function is always a problem. It's really hard to implement a perfect visualization. When using this system, the diagram focuses more on the genre rather than the position. However, the position is important to some extent.

3. The style of the font, the position of the SVG, the size of each element are needed to consider more.

5 Future Work

1. I will add a Compare page to this system which I have already added the entrance to the menu bar of the main page. The user could select which
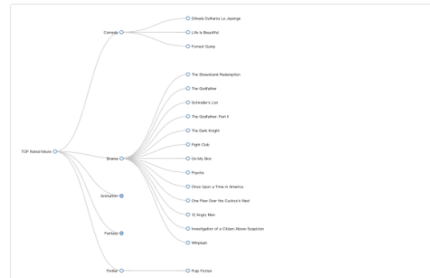
Movie Ranking An interactive way to visualize, find and compare movie rankings using different techniques.
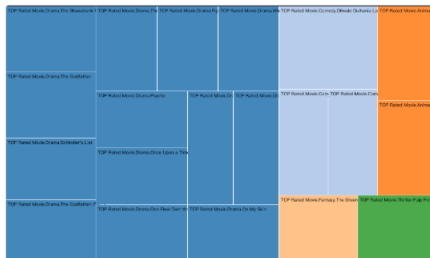

Sunburst

A sunburst diagram is a multilevel pie chart used to represent the proportion of different values found at each level in a hierarchy.


Node Link

Node-link diagram literally means the diagram consists of a set of nodes and of visible link between two nodes. The nodes represent the data, and the link is used to represent the relation between the data items.

Treemap

Treemaps display hierarchical (tree-structured) data as a set of nested rectangles. Each branch of the tree is given a rectangle, which is then tiled with smaller rectangles representing sub-branches. A leaf node's rectangle has an area proportional to a specified dimension of the data. Often the leaf nodes are colored to
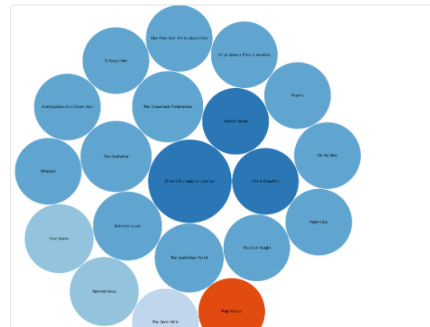
Bubble Chart

Bubble charts can be considered a variation of the scatter plot, in which the data points are replaced with bubbles. The sizes of the

Figure 2: Main Page of this movie visualization system, include the name, shortcut and description of 5 techniques

Figure 3: Sunburst diagram. When click one slice, this slice will be highlight. Each color represents one genre, and the size could be defined by the score.

Figure 4: Node Link diagram. If the node circle is solid, user could click the node to collapse or expand the child nodes.
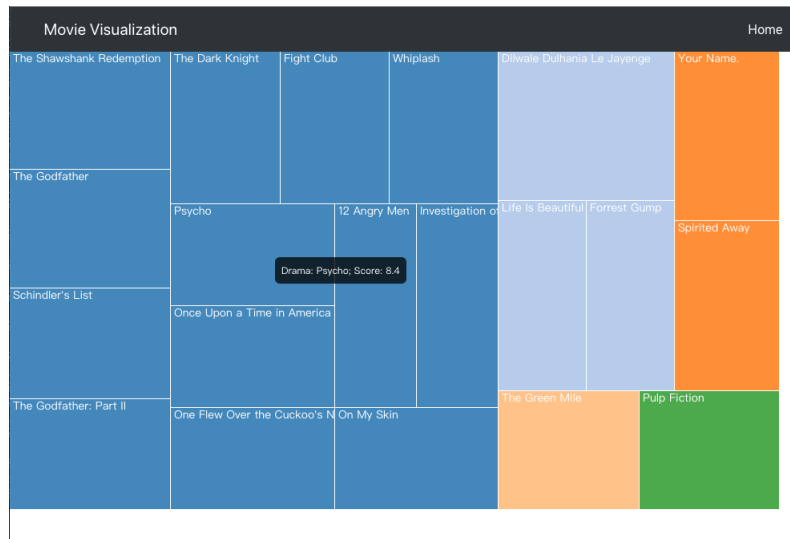
Figure 5: Treemap diagram. Each color represents one genre, and the size is determined by the score. When the mouse hovers over one cell, a tool tip with genre and score information would show up.

Figure 6: Bubble Chart. Each color represents one genre, and the size represents the score.
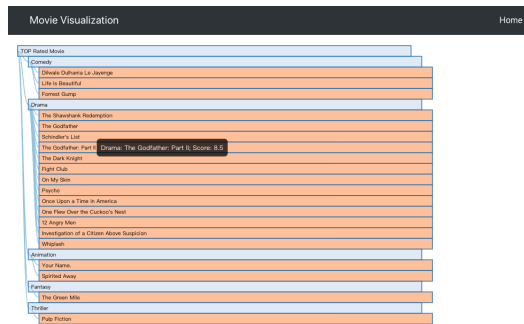
Figure 7: Collapsible Indented Tree. When click a parent bar, it will collapse or expand its child elements.

techniques should be compared, and then visualize the same dataset at one single page.

2. I will add a more specific tooltip include the flyer, the published year, the introduction and the score of the movie. These would also need to use the API of the movie database.

3. According to the paper, the system should support the user to add their own data. In order to implement this function, I need to add a search engine to search for a specific movie then add it to the visualization.

References

[1] Leandro Guedes and Carla MDS Freitas. Exploring music rankings with interactive visualization. In *Proceedings of the Symposium on Applied Computing*, pages 214–219. ACM, 2017.