COM-480 Data Visualization — Spring Semester 2021

Milestone 2 (May 5, 2021)

Auguste Baum, Yanis Berkani & Clément Petit

The main goal of Music Trends is to visually depict the evolution of (western) music over the last century, over many criteria and in varying granularity (overview vs. comparison of 2 years). Towards this goal, we are planning several visualizations:

Visualization #1: Timeline — Core

The timeline will allow users to see the evolution of music throughout the last century. For instance, it can be used to display the most popular tracks of each year as shown in Figure 1.

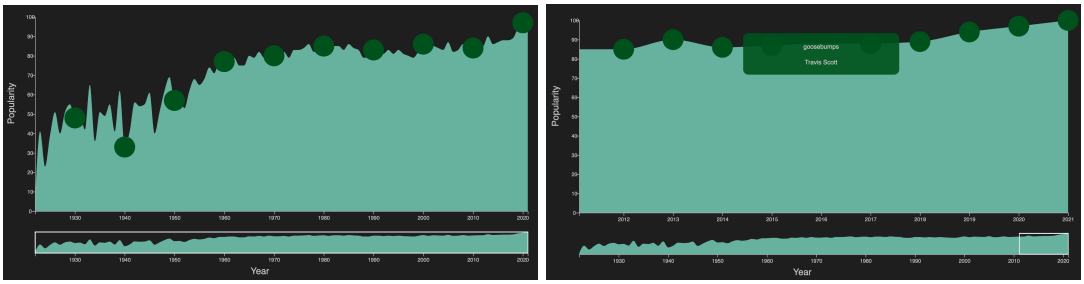

Figure 1: A proof-of-concept of the timeline visualisation. The figure on the right shows the tooltip displayed on hover, containing more track information.

1.1 User interaction

Hovering over a data point will cause a **tooltip** to appear containing track information. The period of time shown will be made interactive using a **brush** (at least a decade and at most a century; see bottom of Figure 1). Finally the user will be able to choose which musical feature they want to analyze, and also limit the data shown to a single genre, using a **drop-down menu**.

1.2 Tools and lectures

The focus and context system used to zoom in on a time period was presented in exercise 5: "Time-series data & Multiple area charts". The tooltip mechanism is linked to our lectures on interactive D3 "5.2. More interactive D3" and is a common HTML/CSS tool. The drop-down menu makes use of the `.on` call in D3 seen in lecture 5.2 and is also a common HTML/CSS tool.

Visualization #2: Bubbles

This visualization allows the user to compare the musical features of the music from 2 different years, as seen in Figure 2.

2.1 User interaction

The user will be able to choose the two years that are compared, and the bubbles might transition smoothly by an **animation**. The choice could be made through a **drop-down menu** but it could also be made using two **sliders** that span the whole range of years, as shown in Figure 3. The user might also be able to choose the features compared through a drop-down menu. The user will be able to get the precise feature values by hovering on a group of bubbles, through a **tooltip**, as shown in Figure 5.

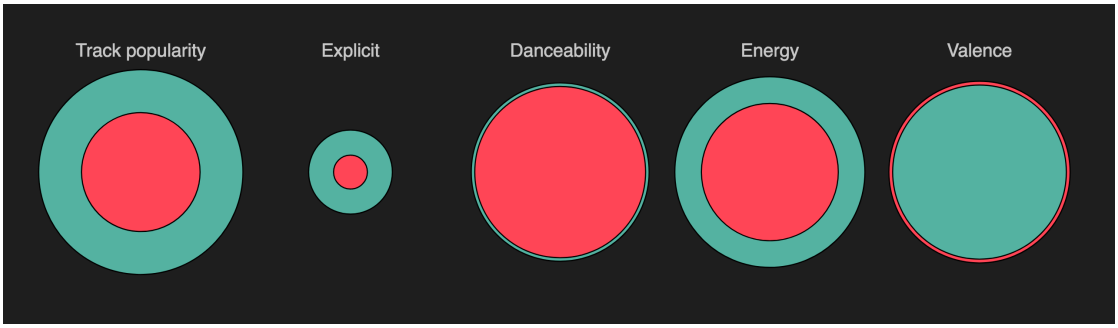

Figure 2: A proof-of-concept of the bubble year comparator visualisation. The red bubbles show the average of each feature for 1950 and the green for 2001.

2.2 Tools and lectures

The drop-down menu and tooltip will be the same mechanic as in the timeline visualization, for coherence (and code reuse). The slider mechanic will be based on the `rangeslider` mechanic that seems to be common in HTML/CSS.

Visualization #3: Bar chart

This visualization will allow the user to study the evolution of the popularity of genres over the years or decades. It will consist of a interactive bar graph representing the popularity of each genre in a single year or decade, and the bars could be ordered by popularity. When a user changes years or decades, the graph would transition by first changing the bars' height to obtain a graph similar to an audio spectrum, before reordering genres in decreasing order of popularity. This process is shown in Figure 6.

The choice of year could be done using the slider mechanism discussed in the bubble visualization and in addition we could have a way to animate it (ie. increase the year every unit of time).

3.1 Tools and lectures

See tools needed for the bubbles visualization; animations are covered in lecture 5.2: "More interactive D3".

Visualization #4: Extra ideas

- **Audio spectrum:** A musical journey through the years, where we show the top 3 songs of a certain genre (most popular at the time) and use the Spotify API to play the tracks. This would not exactly be a visualization but we believe that it would greatly increase the user experience.
- **Pioneers:** We could show the impact of certain artists/tracks on a genre, i.e. when a genre has a large rise in popularity, which are the most popular artists/tracks at the time—we'd extrapolate by saying that those artists/tracks are "pioneers" of that genre. We could visualize this by comparing how popular was the genre of the artist/track before the track was released and afterwards in the form shown in 4.

Note that our project will be mainly using the following lectures: "Web Development", "Javascript" (all lectures), "D3.js", "Interactions"; and that we were also inspired by most of the other lectures.

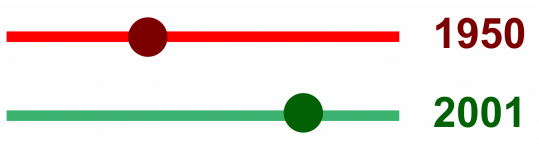

Figure 3: The preliminary design for the sliders, as they would be used in the bubble visualisation.

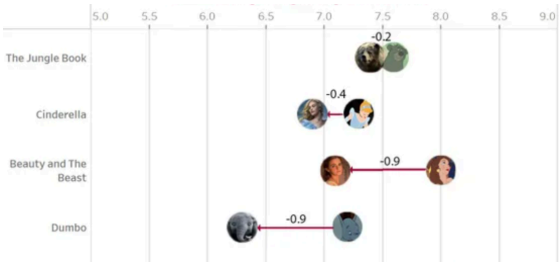

Figure 4: An example of the plot we could use to show the pioneers. The original can be found at this link.

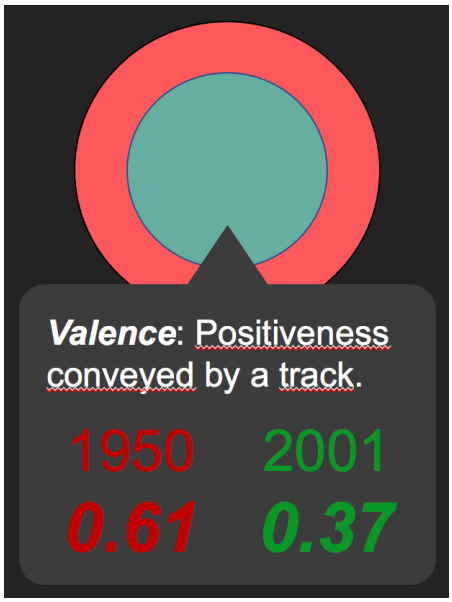

Figure 5: The preliminary design for the tooltip shown on hover, as it would be used in the bubble visualisation.

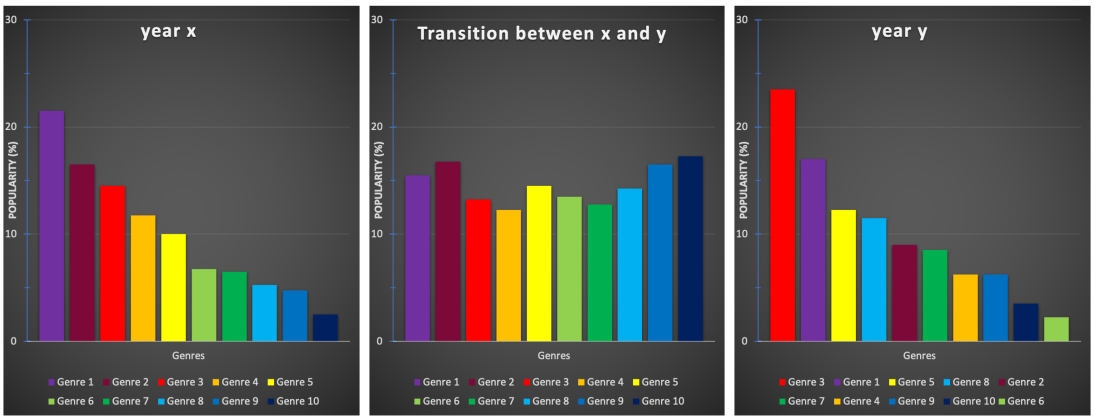

Figure 6: A schematic view of the transition between years for the bar chart.