Music Genre

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# ABSTRACT

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## Author Keywords

Authors’ choice; of terms; separated; by semicolons; commas, within terms only; this section is required.

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H.5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous; See<http://acm.org/about/class/1998> for the full list of ACM classifiers. This section is required.

# INTRODUCTION

Music is a passion for us, the authors of this paper and is also a world of choices: there are more than a thousand music genres that have been created until today. In this streaming era, genres are becoming more blended, and even Spotify has labeled over 3,000 genres to their available content. There is a lot to choose from. Each one of us has an interest in different musical genres. This difference, together with our passion for this art, helped us choose the domain of musical genres and to present popular artists within each one.

Music is not just listening to it: it is far beyond. It is also knowing the background, what is behind it. It is relevant for us to learn when a certain genre originated. It may be more recent, but it did not cause a major impact; it may be older and have recently return to the top of the lists, a resurgence. It is very interesting to watch the evolution of this art: this is our proposition.

Recently, it is increasingly common to use platforms to listen to music: these concentrate almost every single proof of each genre. We can say they have everybody’s cup of tea. Therefore, we found interesting using these platforms’ data to obtain information about the most recent decades. With our project, we intend to have an overview of the evolution of the biggest music genres, their origin, and their popularity; which are the most famous artists; what is the geographic distribution of artists compared to a genre: is it a genre popular in a certain country, but the artists who elevated them to the tops are from the other side of the globe? This also takes us into a journey around the world, to discover these crossings in this art history.

## Our First Questions

Finally, we wrote some initial questions, which we, as a group, were interested in answering. Based on these, we started developing our work: how has a genre popularity evolved over the decades? What are the most popular artists of this same genre? And where did they come from? What more artists, whether on the top or not, are related to these? How has a particular genre evolved in a particular country? And did an artist always kept the same genre, or did it try new paths, risking different or even opposite genres? There were our initial questions that motivated us to carry out this project

# Related work

Music is a common art in the daily basis of most people, thus is an art well studied and investigated, for business purposes or simply to admire how music works. For our study, we searched how visualizations of these studies are being created and what could we improve.

This art could turn into a general study of timelines or in a more deep way, how different characteristics like volume, mood, melody, instruments, tempo etc. that can be extracted from the audio file change depending its genres, existing multiple visualizations about it.

Due to technology, there are various authors that generate a visual studies of specific sound properties that enable users to interact and visualize the music in a way that is more understandable, meaningful, and entertaining. One of the interactive interface which is Visualizing Genres [1] is presented for how visualizing genre data could help us understand its music landscape with publicly available data. The interface consulted Spotify’s API to get their assigned genres, which is one of the objectives for our visualization, even lacking interactivity, since the only interaction available is selecting a square, which represents a genre.

In order to design and develop music visualization it is possible to have real-time animation where animation is generated based on the music data when it is played, like the Windows Media Player (1998) and preprocessed animation that is developed by the author according to specific ideas about the purpose of the animation. One related work that helped our visualization is Musicmap [2] that attempts to provide a genealogy of popular music genres, including their relations and history, making easy to understand despite its complexity. The authors choose a specific number of genres, determining forms of hierarchy and analogy and ordering everything in a logical way.

MusicPopcorn [3] displays in a network idiom how genres and sub genres are related with inserting the notion of genre hierarchy. This introduction of a network to understand the relations with genres gave us the idea to display how the genres and artists can also relate.

This visualizations had the genre in common but the artists and how they are connected even though the genre it is not the same are not displayed, we found that this type of relations were not being used as a form of data visualization. Therefore, we decided to use as an idea these sources and join them in a visualization that could also answer us to the initial questions.

# THE DATA

Since the source of our dataset was an essential aspect to us, we planned to retrieve from platforms that we used, so we can also learn what these APIs provide us. This search has happened while we also look for questions to answer, since we did not know what we had information about before we retrieved the data.

First, we choose Spotify [4] and LastFM [5], since these are the most popular platforms. The first one had multiple attributes that led to a complex dataset that could turn into an unhelpful one. We had to retrieve also from the second one to compare and decide how we would proceed.

We figured out the sources did not have the same fields so we could join data in a easier way, so we moved to scrapping more sources and decide after. In the end, we had four sources: LastFM, Spotify API, MusicBrainz [6] and AllMusic [7], that turned into several datasets, since it was not possible to merge it into one.

The most important attribute is time that will help us answer some questions, so time turned into decades.

The purpose of this visualization is also use data about artists, but there are an enormous amount of artists and bands. With that in mind and in order to have quality information instead of quantity we decided to only use artists that hit in some point the top 100. These artists have their personal information in multiple platforms and also their genre so we gathered these information in a dataset only about the artist, that has attributes like popularity and place of origin.

After genre and artists derives their music, so we also had to decide if we would focus in songs, EPs or albums. The albums were the field that most appeared in these platforms, it is the album that reaches the Top.

Where did you get your data from? What challenges did you face? Did you have to correlate sources? Did you have to clean it up? What data did you think you’d get and ended up not finding? Which compromises did you make? Also, be sure to mention scalability issues. Did you have to filter things out? Aggregate them? Derived measures? Go beyond Checkpoint II: after it, did you need to revisit the data and its format? Make changes? Describe them and why

# visualization

Figure 1. Music Genre visualization.

## Overall Description

The solution achieved is a data visualization that is divided into five sections. Each section displays different type of information and it is possible to interact with it and between sections. There is also a button that resets to the initial state.

At first, the visualization will display all genres on the line Genre Evolution, as well for the artist locations in the World Map and the Birth Dates. The Most Popular Bands initiate with the most popular bands for the most popular genre, which is Pop. The Tags Network is initialized with the main node as the most popular band of the most popular genre.

Data can be filtered by interacting with each section. Besides selecting there is also the possibility to use hovering to read what is selected.

Next, we will present how each idiom works and how to interact with it.

### Genre Evolution

This idiom is a line chart that displays the genres and how they evolve throughout the decades, using the popularity attribute. When clicking on a line, this genre is selected for the entire visualization and the other lines get their opacity turned down. On hover it will display a label with the genre.

If the user selected a location on the World Map, the line chart displays the genres for that location. If an artist is selected in our visualization the line chart displays the line referring to the artist’ genres.

### World Map

A map where it is possible to select a location for the visualization, represented by a bubble. On hover will display the number of artists from that location. When a genre is selected in our visualization, it displays the locations of the artists of that genre. If a location/artist is selected, the bubble will be highlighted.

### Most Popular Bands

This is a bar chart and each bar represents an artist or a band, and it is possible to see its popularity on y-axis. While on hover, it will display the name of artist. The click will select the artist for the entire visualization.

When a location is selected, on this idiom it will show the most popular artists of that location, but if a genre is selected, it will display only artists for that genre, the most popular ones. When an artist is selected, a sixth bar is added that represents their popularity.

### Birth Dates

This is a lollipop chart and represents the birth dates of the artists or creation of the bands. On hover it will display a label with the number births in that decade. By clicking on a decade, it will display the years of that decade.

When an artist is selected in our visualization, the line and dot of the respective birth is colored and a label its added with the year.

When genre is selected in our visualization, this idiom will display only the birth/creation decade of artists of that genre. If a location is selected, then only birth/creation decades of artists of that location.

### Tags Network

This is a network chart and each node will represent an artist, despite which layer is selected in our visualization. With this chart is possible to understand the relations between the artists using common tags, therefore the sub nodes of an artist will be artists/bands that have tags in common, representing an association.

If a location or genre is selected, it will show the most popular artist of that location or genre. If artist is selected, it will display the artist itself.

## Rationale

Why did you think your techniques would work? What visual encodings did you use and why (and why not others)? What alternatives did you consider, even if they turned out not to work? Especially, discuss how you managed the complexity of real data, and matters of scalability. Also, include in your discussion the evolution of the prototype, from the initial sketches to the last version highlighting what you learned from version to version and how that influenced your design.

## Demonstrate the Potential

Describe for at least a couple of cases (from the questions you promised you’d answer before) where, step by step (illustrated with screenshots), you find the answers you seek. In short, demonstrate the potential of your solution! Does your visualization provide insights on data that you were not expecting / that are not common knowledge? These are pure gold! Be sure to include them!

# Implementation Details

What challenges did you find and overcome? How did you implement the links between the views (incl. brushing, etc.)? What algorithms did you use? What techniques did you adapt, or implement, from scratch? (instead of just copying & pasting them from the D3 examples page…)

**CONCLUSION AND FUTURE WORK**

# Balance is always the main subject of discussion in music genre genealogies and the capital reason why an absolute visual reference has been absent thus far (and probably always will be).

# ACKNOWLEDGMENTS

Sample text: We thank all the volunteers, and all

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