Process Book for Genreology:

On the Origin of Genres

Melanie Justiniano and Matt Sheets

Introduction

Background and Motivation

We wanted to work with a mutual interest and with a database that had a lot of interesting data, and music seemed like the intuitive choice. We particularly liked visualizations that evolved with time, and we thought that it would be interesting to look at how and where genres develop, spread, and become popular across the United States.

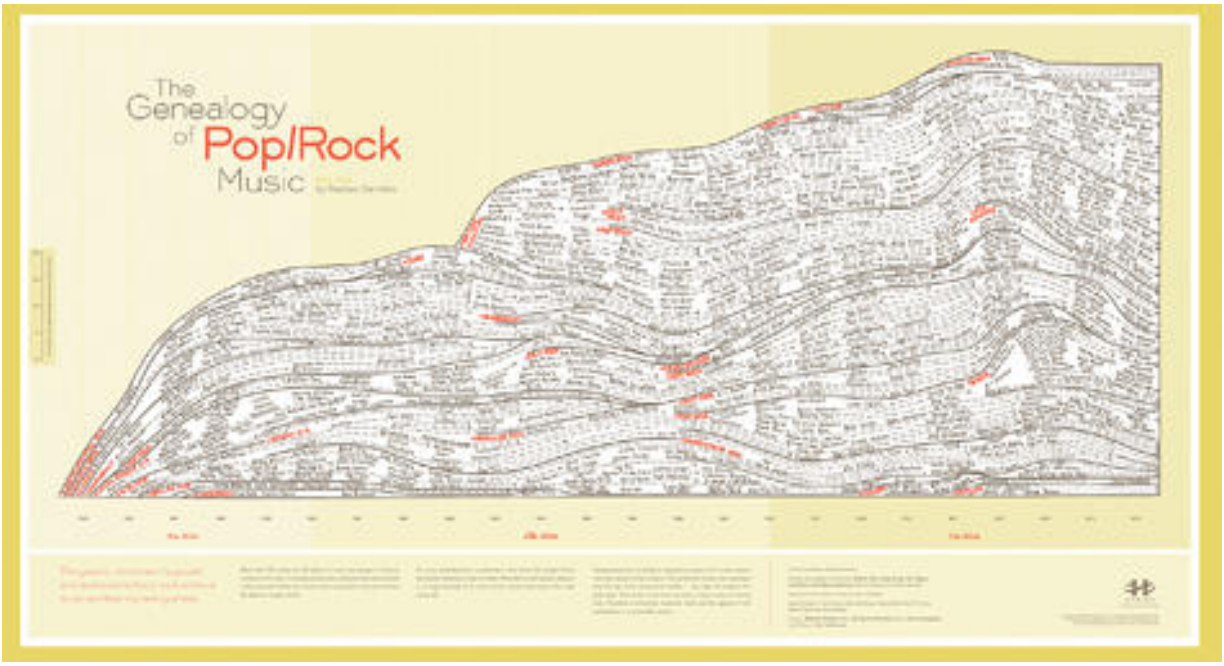
Upon identifying that we were interested in seeing the geographical start and evolution of specific genres, we then discussed potential metrics by which we could track and visualize this information. We concluded that the starting locations and dates of various artists/bands would be an ideal metric for genre start and geographic dissemination. We are basing this assumption on the idea that the popularity of a given genre will inspire other musicians in a given area to start and pursue that movement (e.g. the top four bands of the grunge movement, Nirvana, Pearl Jam, Soundgarden, and Alice and Chains, all originated in and around Seattle).

Project Objectives

We are trying to see how music spreads, and if the nature of a specific genre's dissemination varies based on origin. Are different genres better received in different areas? What about during different times? We want to learn about a lot of different kinds of music, and what music preferences look like in the United States. The benefits of this visualization are to provide information to people who love music or people who wish to study its evolution. In the end, we want to see how music crosses geographic barriers and how that changes in different eras (even if it's just focused on the 20th century and beyond).

Related Work

The Genealogy of Pop/Rock Music



This image by Steve Chappel and Reebe Garofalo in *Rock 'N' Roll is Here to Pay: The History and Politics of the Music Industry* (1977) was shown to us in lecture. We thought that introducing a geographical dimension to this graph could allow for a lot more exploration. Using d3 and using interaction could also allow for a deeper understanding of music evolution.

Data

Data Collection

Genre

We collected data from the Echo Nest (http://echonest.com) which is a database/api that many modern music companies like Spotify use to create music recommendations. Several libraries were available to us which would provide the data we needed such as general genre information and top artists for each genre as well as artist start date and place of origin.

We initially structured our data to be a list of genres. We took every artist in the genre and organized them by their starting year. Thus each genre included a list of years, and each year included a list of bands that started that year as well as their starting location.

Location

Since our visualization is geographically-based, we needed a way to translate the starting location of each artist into a latitude and longitude that d3 could understand and place on the map. Thus, we used the Google Maps API to geocode each artist location.

Data Analysis

When we were first drafting our project, there was debate as to what the best method of gauging genre popularity was. Some of the other metrics we considered were through how much money a genre might have made that year or how many music plays it had. The main issue we found with these proposals was simply a lack of data. When we visited the data we did have, we found

an interesting solution: using artist starting location. This allowed us to really incorporate both the geographic and the evolutionary elements we were looking to analyze.

Data Organization

When we began the project, we structured our data to be organized by year because that was how we originally envisioned the visualization. We then began to consider the idea that the data should be organized by city instead of year because that was a more accurate representation of what our visualization was actually doing. We were concerned about the design of our code as well as the design of our visualization, and we thought that the statistics we were going to use should be decided in the beginning instead of when executed.

Implementation

Overview

Our visualization is composed of four main parts: a dropdown menu that allows the user to select which genre they wish to look at, a map of the United States with circles as cities where bands originated in, a slider that shows the number of artists that originated that year over time and changes the map to reflect that point in time, and a side panel that either shows a bar graph of the most popular cities or a list of artists in a selected city. We also included buttons and keyboard functionality that would allow the user to play the visualization or move back and forward in time using the arrow keys.

Functionality and Rationale

By separating the genres out and allowing the user to only look at them one at a time, we realize that we lost some of the overarching view of music that the “Genealogy of Pop/Rock Music” had, but we decided that our visualization could be a medium to examine music more closely and it would allow for more information to be gleaned out of a lot of different genres in a less overwhelming way.

We decided that marking artists as circles on the map and then changing their radius by how many bands originated in that city would encode the most visual information. Even if the user would only look at one year of one genre, they could still potentially determine where that genre gained popularity first. As we colored the older cities more lightly than the newer ones, the user can still gauge time off of one static year.

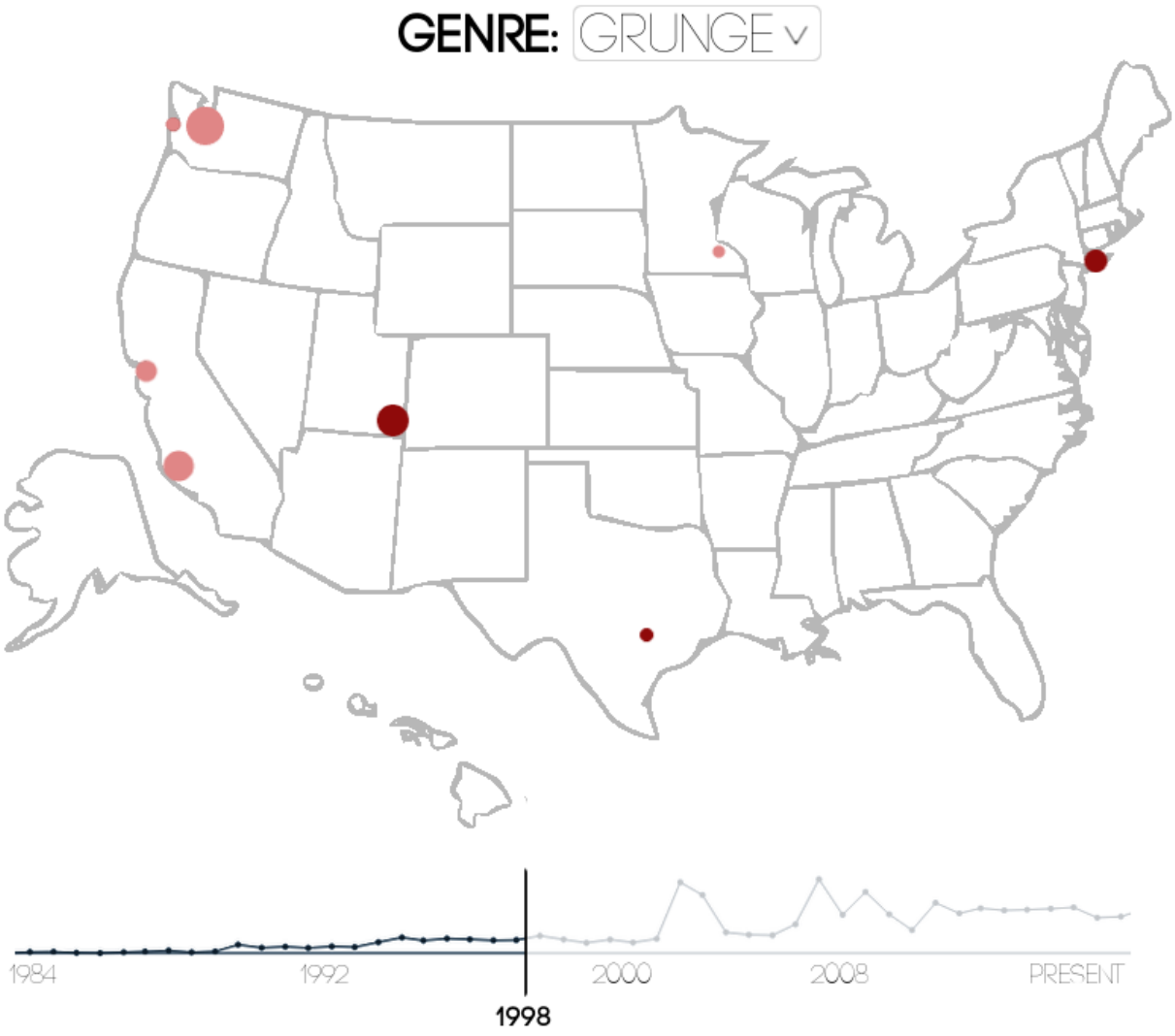
In involving the time component, a user could then use the spread of the genre to continue to gauge where the genre was most popular, but they could also determine how music spreads. We thought that using these visualizations would allow the user to have control over exploring whichever genre they found interesting, and it would allow them to come up with their own theories as to where and why music was popular.

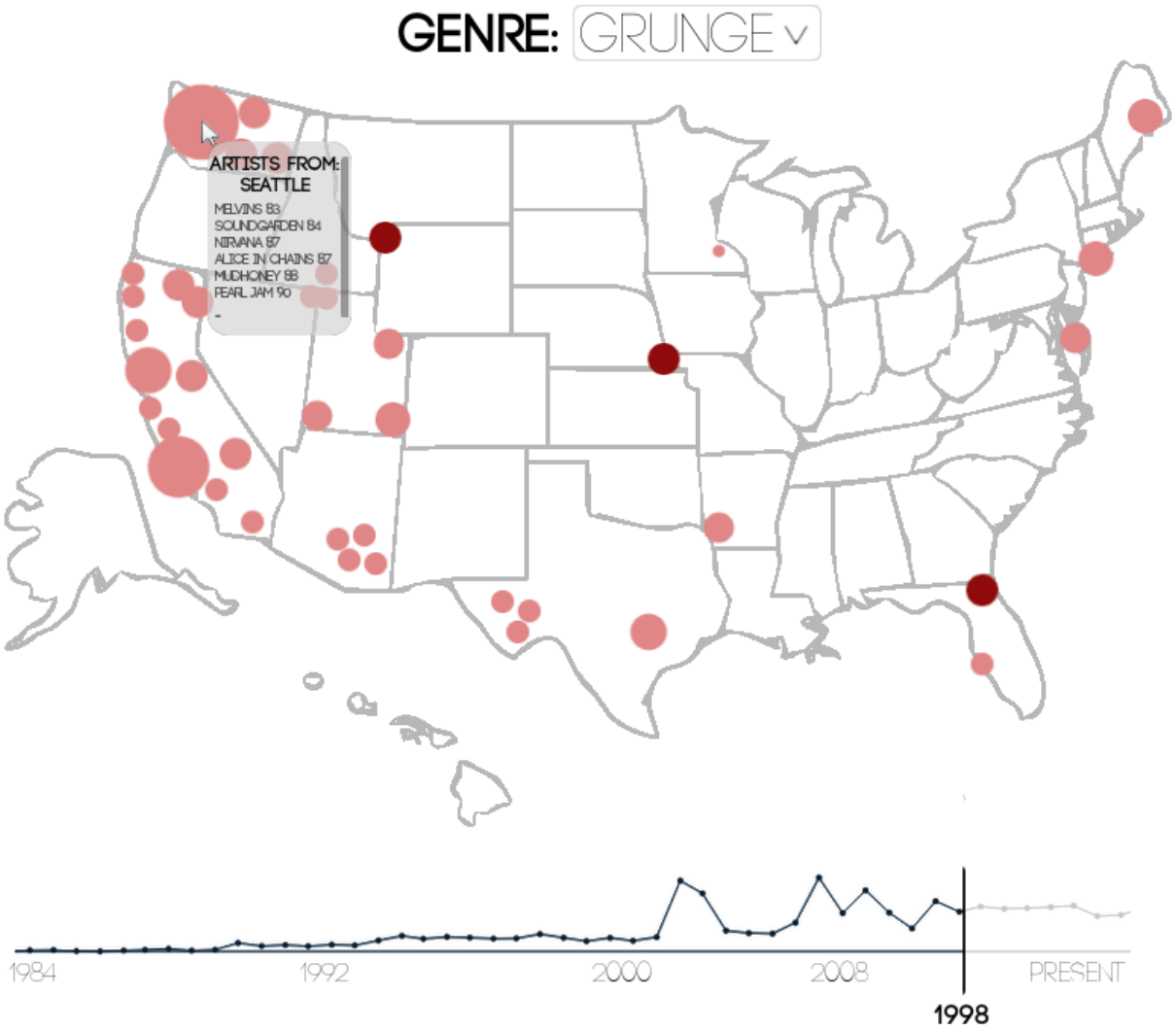
In the side panel, we hoped that having a static bar graph that was scaled with all the genres together would anchor the user as they explored the time dynamic but also give some means of comparison to other genres. In selecting a city and being able to view artists, the user would be able to extract detail from the visualization that would not have been readily available from the map itself.

Finally, the keyboard navigation and the interactive buttons would allow the user to interact with the visualization with minimum effort and truly let the user become immersed in the exploration of genres.

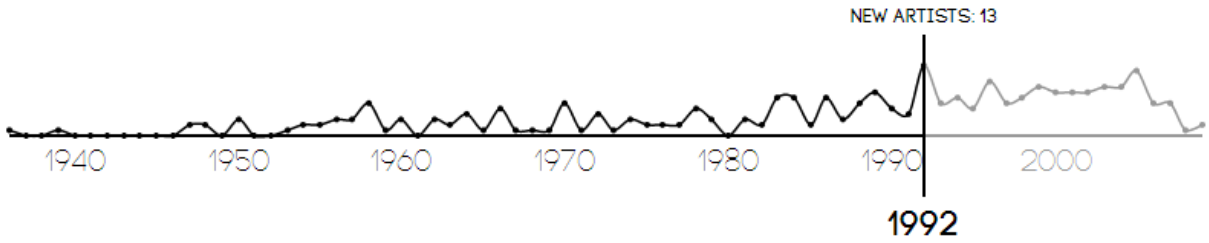
Design Evolution

Original Sketches




GENRE: GRUNGE
ARTISTS FROM:
SEATTLE
MELVINS 83
SOUNDGARDEN 84
NIRVANA 87
ALICE IN CHAINS 87
MUDHONEY 88
PEARL JAM 90
-
1984
1992
2000
2008
PRESENT
1998

Line Graph Slider



Country in 1992

Scaling and Axes

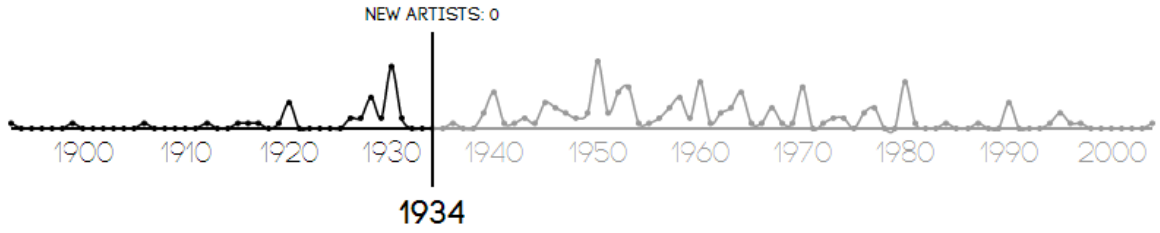
Horizontal Axis

When we first designed the slider, we first questioned how we would determine the y-scale and the x-scale. One option would be to have a universal scale for each genre so that even the slider itself could be a comparative measure of one genre against another, but we decided in the end that the slider should evolve with the genre it was representing. Thus the x-scale of each genre would start at the first and last years a band originated in that genre.

Vertical Axis

With the y-scale we decided that we shouldn't have a y-axis. The slider was really only supposed to provide an overview over time, so with this in mind, we had the y-scale range from zero to the number of the most artists originated in one year. The number that appears on top of the bar is the number of artists that originated that year. The reason that we felt that this would be the best way to represent the scale of a genre was because we felt that a y-axis would clutter the slider. Having a number on top of the slider would give the user immediate information as to how many artists originated that year and still have the visual comparison.

Empty Years

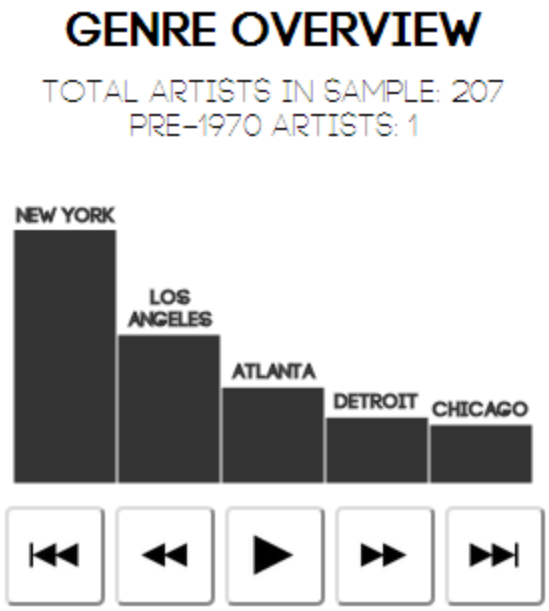


Blues in 1934

Before we changed the data structure to be organized by city instead of year, another question we ran into when implementing the slider was what to do with years that had no bands originate. We could either only change the map when a data point was selected, or we could populate the array of years to encompass years with no information. We decided that because we technically did have the information, we should include the zero data-points. This allowed for the slider to look cleaner and more accurate.

Side Panel Visualizations

Bar Graph



Hip Hop

Static Overview

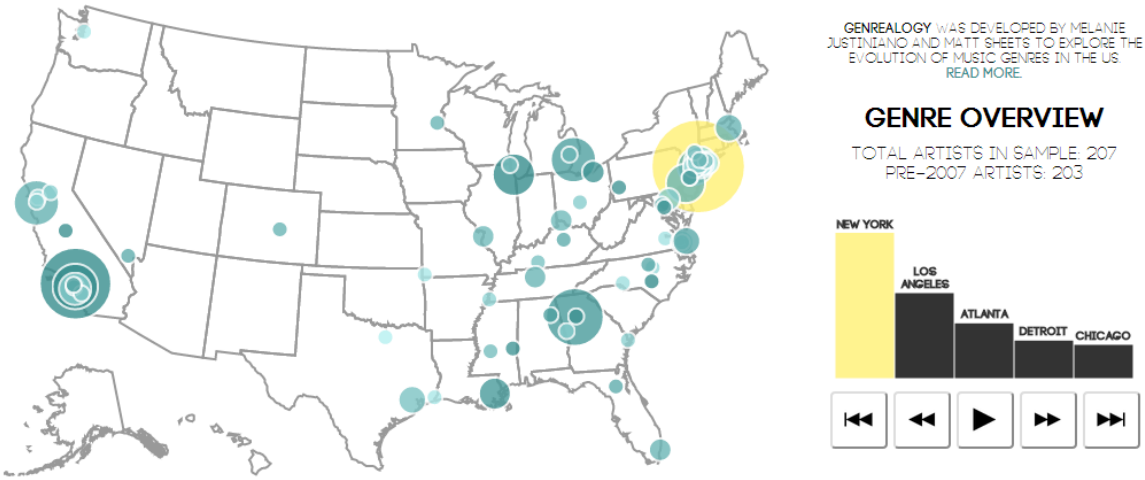
When deciding to add another detail visualization, we wanted to include a quick overview of the genre that didn't change over time. The bar graph orders the five most popular cities, so while the graph does not show much information at the beginning, the bar graph would present a constant overview of the genre. We thought about making the bar graph update by most popular cities per year, but we decided that information was already given by the radii of the circles, and the bar graph's main purpose was better served as a way to anchor the user.

Limiting City Number

The bar graph shows only the five most popular cities in a genre. The reason for this was to quickly emphasize the most popular cities from the beginning so that the user would have the

story of where to look for developments. The reason we did not choose all the cities was because we felt that having every city would make the bar graph highly cluttered. Again, we felt that the map could better show that information.

Highlighting Cities



Hip Hop with New York highlighted

We also added a feature that would highlight the city when the bar was moused over. We felt like this would be the easiest way to tie in the bar graph and the map and allow the user to interpret and incorporate both visualizations at once. When that bar is clicked, it holds the same functionality as clicking a city - the list of bands that originated in that city shows up.

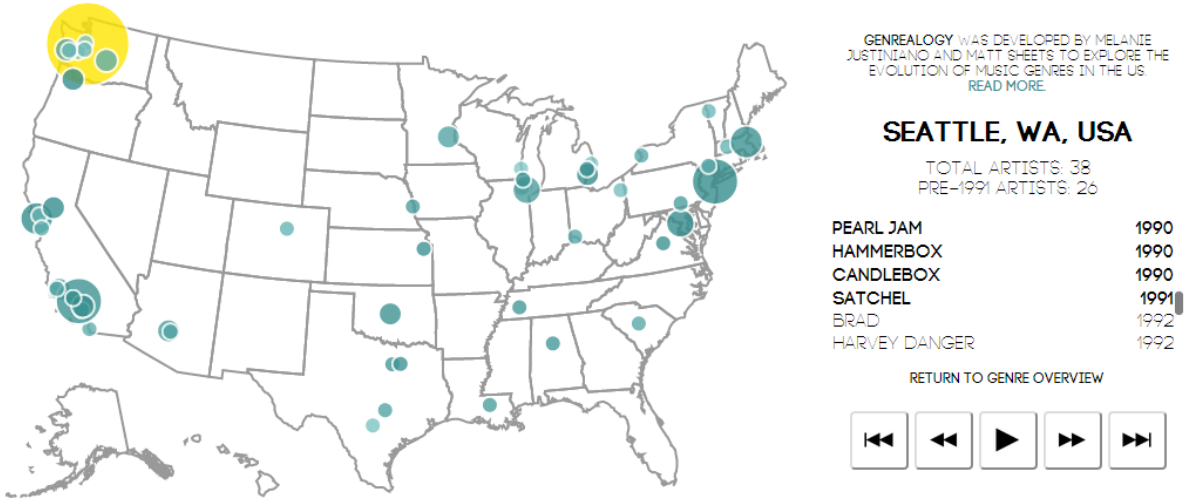
Scaling

Latin with shorter bars showing fewer artists

When we got to the bar graph scale, we encountered the same question as with the line graph - should we scale the graph to each genre, or should we scale it overall? In the line graph, we scaled it within genre, but in the bar graph, we wanted to encompass a comparison with other genres as well as an overview. Thus, we decided that the bars should be scaled with all the genres. This made the smaller genres visibly smaller which we thought was important in looking at music genres.

Artist List

Grunge with Seattle selected in 1975



Grunge with Seattle selected in 1991

Static Overview

We had the same debate over whether the artist list should update by year or be dynamic with time, and we ended up with the same conclusion as the bar graph overview. The side panel was to provide overview of the genre to give the user better context overall. Since the artist list

wouldn’t be updated by year, we decided to include the starting year of each artist in the list from a city and bold the artists that had appeared that year or before. We thought this would be the best way to both give the user the information they might be exploring while at the same time, keeping true to our intentions with the side panel.

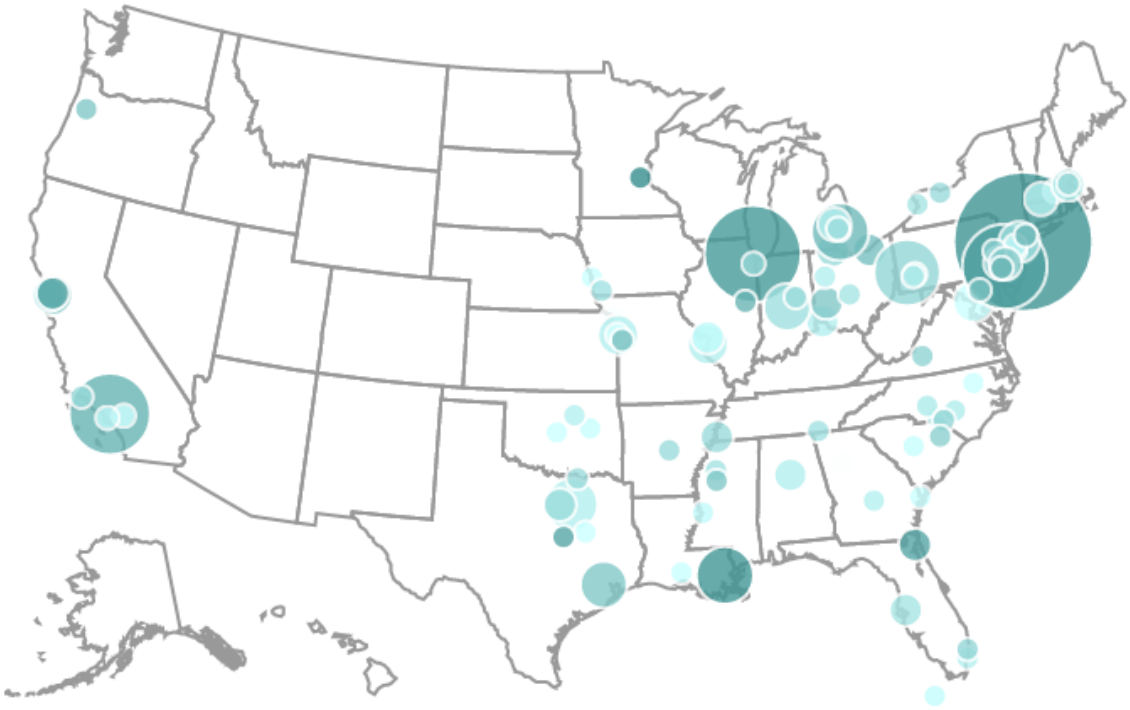
Interactive Buttons

Creating interactive buttons that could play the visualization was one of the ways that we tried to incorporate story-telling in our project. We thought that having the buttons not only improved the design of our visualization, but it also made it so that the user had multiple ways to interact with the map. Using the slider is great for selecting a single year, but having the play button standardized the speed with which the visualization updates, giving it more a stable progression forward and better sense of the how the genre developed over time.

Keyboard Interaction

We also made it so that the left and right arrow keys could control the visualization. We thought that having the keyboard included made the experience more seamless and gave the user easier access to the visualization. The controls are intuitive but are explained in the side panel.

Map Visualization



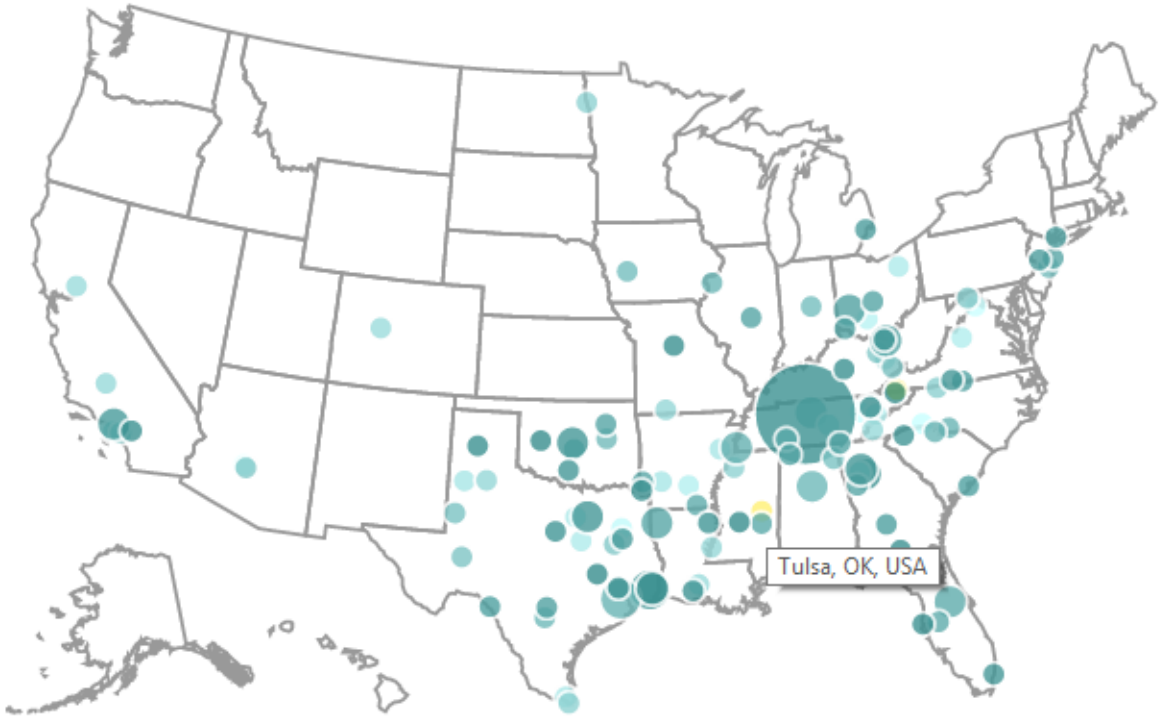
Jazz in 2000

City Color

One of the main departures that we made from our original design was changing the color of the circles that represented cities. Originally, we thought we would make the cities from past years one lighter color while the cities that originated that year would be a darker shade. We decided a better way to represent this was to do a color gradient of the circles. The longer a city has been on the map without an artist being added to it, the lighter the circle representing it would be colored. By the end of the time visualization, it was easier to tell which cities were more relevant in what time period because they would be colored similarly. On any individual year, it was easier

to tell where and when artists were beginning. This added another dimension to our map that we thought made it more visualization representative of the data we had.

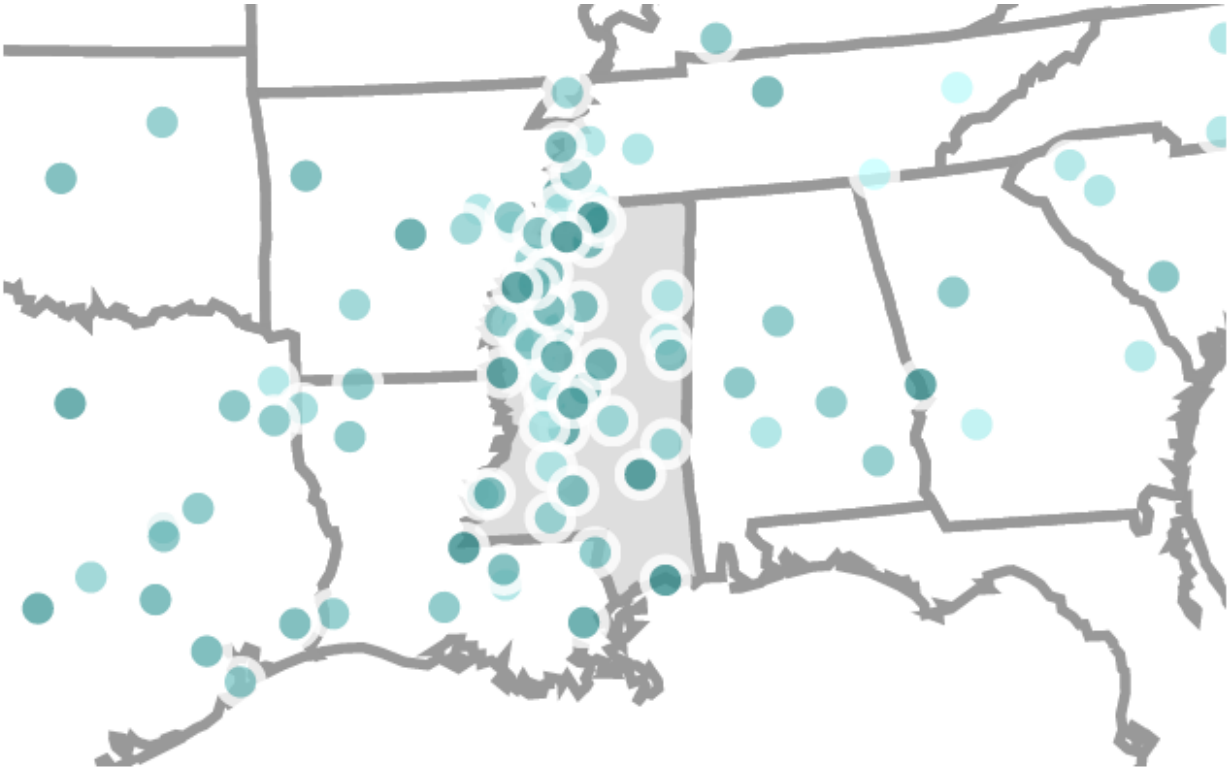
City Interactivity



Country in 1993 with Tulsa on hover

One of the concerns we expressed with using cities on a map was that it might be harder to tell what cities the circles represented. Even as the radii of some of the more popular places increased, it was even harder to see where the center of the circle was supposed to be. We solved this in two ways. The first was that we decided to incorporate the city name into a title, so that when you hovered over a city, it would tell you its name. The second was through the side panel visualization which would show up when a city was clicked and would also display its name as well as artists from that city. We thought these were two very clean ways to add more information to the visualization without cluttering it.

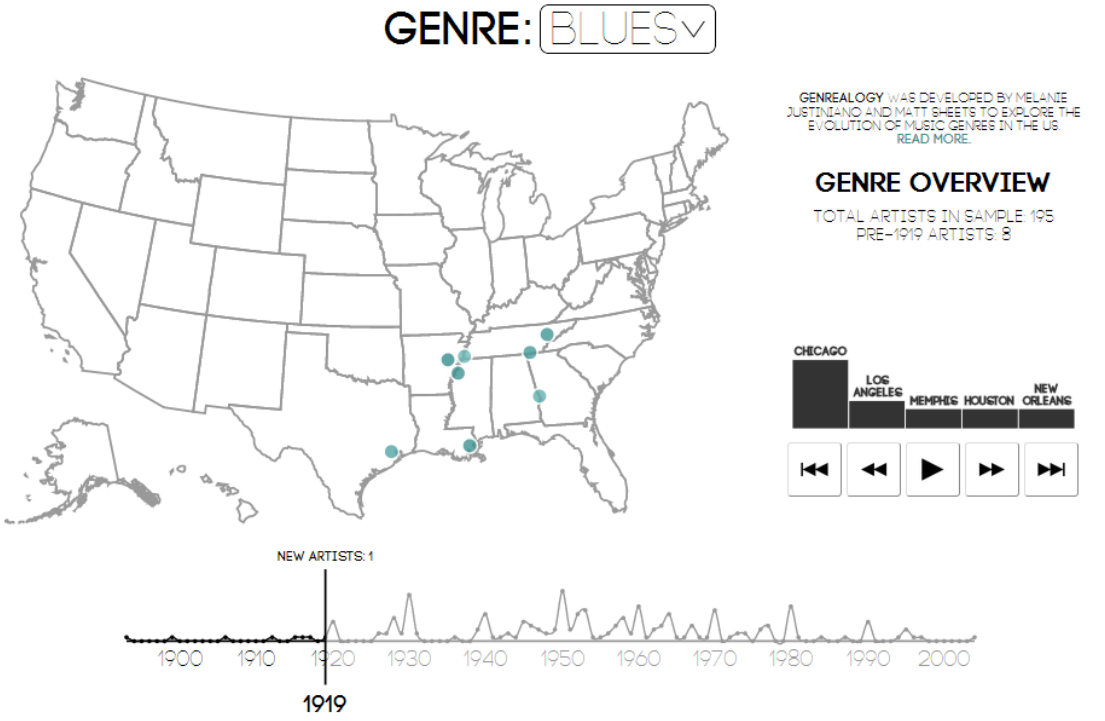
Zoom

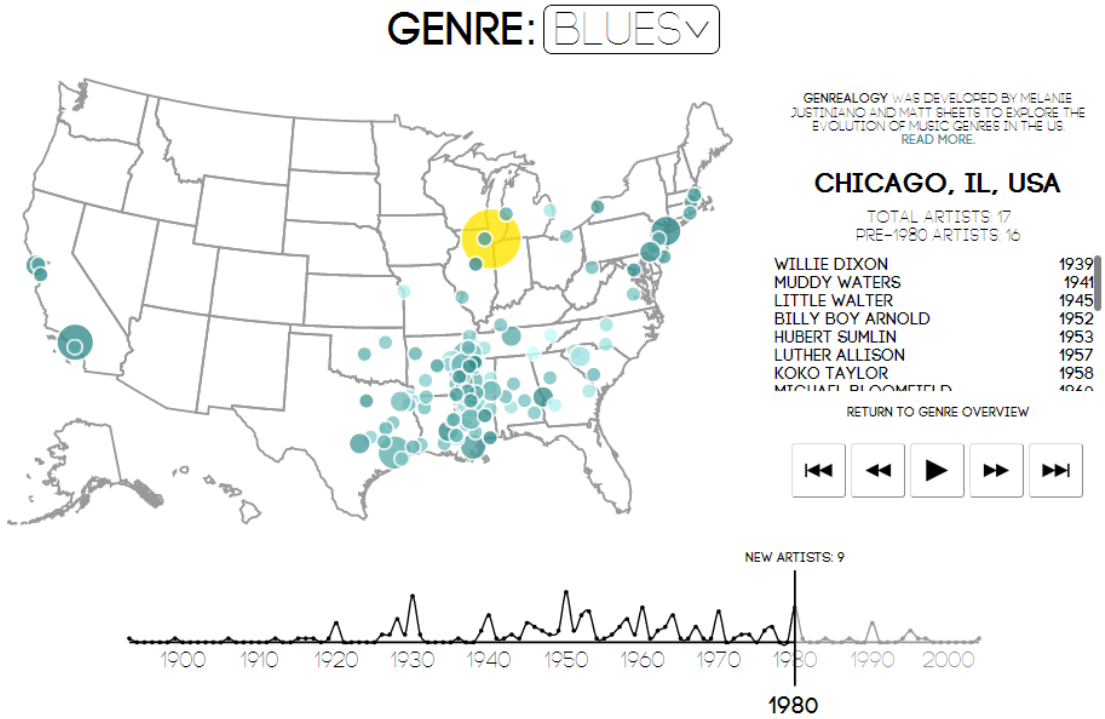


Blues in 1980 zoomed in to Mississippi

The zoom feature of the map visualization makes it so that you can more easily see individual cities. When you zoom in on a state, the circles that represent cities shrink down and are no longer scaled by artist. This is so you can better see some of the smaller cities which occasionally when clustered are hard to differentiate. This also allowed for a closer exploration of states and genres together.

Final Design





Conclusion

In the end, we believe that our visualization accomplished our original intentions well. We fulfilled all of our must-have components and even added extra visualizations when we worried that our visualization would lose context and lose that comparative feature that our inspiration “Genealogy of Pop/Rock Music” had. The project was an incredible learning experience where both of us really got to explore good design practices in code, visualization, and styling. We felt that we were focused almost entirely on enriching the experience and exploration, and we feel that we accomplished that as best we could. Potentially, we could have had more data (as music data is almost limitless), but in an effort to keep things simple, but engaging, we are pleased with our end result - a tool that allows the user to immerse themselves in the origin and evolution of genres.