# SoundScapes

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***Abstract*—This paper details the design decisions and the paths taken to achieve the final visualization called SoundScapes, a deep dive into Spotify's music and the various metrics provided by the platform to classify these tracks.**

***Index Terms*—music, Spotify, singers, artists, genres**

## I. Introduction

### A. Choosing the Subject

To decide what topic would be approached and therefore get such project starting, the group decided together what subject would be of not only the members' interest, but would appeal for the users as well, and nothing sounded more universal than music. Looking through options, the dataset that showed some of the top tracks on Spotify over the last two decades were chosen, since it would be a great way to build a good, interest and interactive storytelling for the consumer.

### B. Goals

Initial goals were simple, creating and pleasant looking page that the user could learn more about the bigger picture of the music scene on the last two decades (according to Spotify's biggest tracks). Further discussions landed on providing a way the consmumers could have an historical view for these last decades (for the different metrics available), analyze how the genres have been doing and even being able to search musics of theis interest and seeing how they were rankes through the metrics, adding the interactiveness and personalization needed for a good project.

With the visualizations ideas designed, the project needed and identity. Always with the objective of constructing an interactive storytelling, the connection between waves (sound waves) and music inspired an idea of making the project resemble a dive in the ocean, starting with a shallow part, a superficial one, and adding depth as you swim out to sea, so, starting with a more generic visualization, adding complexity and interactiveness as you scroll down the page. With that, the deep dive on Spotify's tracks concept was born.

## II. Related Work

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## III. Methods

### A. Tecniques

The project was developed in javascript, heavily relying on the d3.js library to build the different visualizations showed in the page. The interactive potential the d3 library allow the visualizations to achieve matched really well with the intention of the project since its conception, facilitating its choice.

Besides that, with all code being committed into a github repository, the final page was also deployed into github pages, with access available at: (LINK DA PAGINA).

### B. Concepts

Since it was the identity of the project, it was clear that the idea of a deep dive should guide the construction of the page, being one of the primary focus when designing and building the visualizations. The page structure neede to be in harmony with the most important concept of the project.

Besides that, other key concept was the color palette. Although the main idea of the visualizations is to explore the music and its changes and patterns over the years, dataset was directly taken from Spotify, so prioritizing the use of green and black was very important to stay attached to base of the project, its data.

## IV. Results

### A. Front page

Opening the page, the user is presented with the project's name and its identity right away, reassuring the importance of the deep dive concept in the manufacturing of the visualizations. Besides that, the connection with the waves is also showed, with the shapes appearing in the background of the green page (also staying on line with the concepts).

Then, in a black page, we get the Spotify with a short description of the dataset, stating the importance of the platform for the project. Also important in this second page is the description of the different metrics the data offers. Even though the names of these metrics are somewhat intuitive, a deeper meaning and showing in which scale each are measured gives the users a much better understanding that allows them to analyze the data shown in the visualizations even better.

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### B. First visualization: a time-series dataset overview

In the first visualization, we get a different set of line charts that show the evolution over the years of the different features available, with the average value of such metric on the y-axis and the years on the x-axis. The lines appearing in a motion from left to right is a representation of a wave, a moving, flowing design that recalls to whole sound wave concept.

Besides giving the consumers an opportunity of analyzing broadly the change in music thorugh the metrics and a motion-heavy design, this visualization set the stage for the materialization of the other concepts as well. The color palette of black

background and green lines on the graphics ties perfectly with the Spotify's logo and the easy, simple and straightforwardness of the line chart connects with the idea of a first step into an ocean dive, the shallow portion of the sea.

So with this first part of the project's core not only the concepts start to appear materialized and star building up, the consumer can also get used to the features and the information presented on the dataset, explored more heavily ahead.

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### C. Intermediate visualization: a gender overview

With the second graphic being a bar graph of the genres and its popularity and number of songs released in the period, some could be confused on what depth is added in comparison with the first visualization. But the possibility of clicking on each genre and exploring each song personally gets the dive even deeper, adding another layer of inteactiveness as it allows the user to select their favortive genre, gain more information on it and even see the songs individually.

Since some genres have a huge number of songs related to them, it is hard sometimes to find an specific track or an specific artists, limiting the user' capability to fully interact with the data in front of them. This, added with once more the color palette being a match with the logo, set the stage to the final dive, fulfilling its role of being the middle of the ocean, with the consumer not fully emerged.

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### D. Final visualization: a specific music/artist view

For the final visualzation, a search bar is added that allows the user to search for their favorite songs and all the score the songs got in each metric appears in a circular chart, with its popularity percentage (the metric that was given the most importance) showing at the center.

While still with a black background, the scores appear in shades of green and in form that resembles arcs (also reminding the Spotify logo). With all the metrics (besides popularity, another reason it appears at the center) being graded 0 to 1, the circular chart was chosen because of the way it allows the user to quickly identify if the songs got a good or a bad score based on the completion of the respective circle, with a tooltip added that allows to see the exact score received.

This technique ties into Gestalt's Principles of continuity (that suggests that we tend to perceive continuous lines or shapes even when they are interrupted by other elements) and closure (suggests that we have a tendency to perceive incomplete objects or complex figures as complete and recognizable shapes). These principles try to explain how the human mind can interpret visualizations, finding patterns, recognizing form, and are very important principles to be considered when creating an appealing visualization that tends to be informative at the same time.

Besides that, the songs results get compared with the artists' other tracks, giving a full information to the user for the songs/artists of their interest, helping the visualization to be the last tie that completes the deep dive concept by creating the most personal and interactive visualization of them all.

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### E. Broad Results

This detailed description gives a great demonstration of how the concepts really guided the project and its manufacturing, staying on the top of the priorities list all the way true, materializing the identity intended in the initial goals of the conception.

All the way from color palette to the deep dive idea, passing by the choice of specific graphis and visualizations, all the project's decisions were thoroughly thought to deliver an informative yet fun and complete set of visualizations, giving the user's the opportunity to look to the bigger picture, with more general information, at the same time it allows them to search their favorite artists and songs specifically.

## V. Discussions

To achieve the results mentioned above, different processes were made and different decisions came out of each of them. Beside the initial debates that decided the data that would be used and the concepts described earlier (the waves and deep dive ideas), some early designs were made in pieces of paper, allowing them to be visualized in a way that helped deciding the direction that were taken.

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With the visualizations ideas more solid and initially implemented in the page, an MVP (minimum viable product) were made so peers could critic it and insights could be gained that would help with the evolution of the project. Along with compliments that showed the page were going in the right direction, tips going from to information placement to graphics ideas, passing through bugs identification, these critics were crucial for the next step of the project.

Obviously take ideas given by peers and implement is an important part of the construction of a project, but filtering these ideas is as, if not more, important. So reading all the critics and being able to identify what matched to the concept and identity of the page and what could not be implemented or run away from the direction intended was an crucial step to get the results desired.

## VI. Conclusion

Since its conception, the project intended to resonate with people with all different tastes, appealing to an almost universal one, music. With the right dataset, the page designed could bring all sorts of information to the users interested in visiting it.

Besides other implementations that could help bring even more information and interactiveness to the page, fine-tunning the ones existing right now is also on the plans for the continuation of the project. Adding more features onto the site that also highlight even more the deep dive being made when opening the page would show even more the identity of the project. TALVEZ ESCREVER MAIS SOBRE FUTURE WORK!!

Apart from future ideas, this identity and concepts given to the project added to the broad appeal to help build an interest storytelling and personal stamp to the page, an uniqueness that is essential to separate itself from the pack.

And this uniqueness refelcts on the uniqueness that surrounds music inherently, with every individual having its unique taste, favorite songs, favorite artists, playlist and even guilty pleasure. And the project gives an opportunity to everyone find more about their uniqueness.

## References

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