

Summary

This project started with the goal of elevating books through the use of data visualisation. Another goal of this project was to critique the power we give to data when we think of numbers as true and objective. Therefore, my goal in this project was to “make the data say” that books are overall just great by juxtaposing unrelated datasets. I hoped to push my project to such an absurd scale that anyone would question the “truth” I am showing them. Another way of proving that my so-called message is nonsense was to transform the visualisation from scientific looking with a seemingly academic argument to an unrecognisable abstract representation of the same data.

Technologies

MongoDB: The first technology used for this project was MongoDB as a database to store the datasets I worked with and have them easily accessible through queries in the code and to look at them on the web. MongoDB was simple to use with Nodejs and clear in its collections’ organization. I also liked the ability to test my queries in MongoDB to troubleshoot my code when a dataset was incomplete or strangely organised.

Nodejs: Node is a JavaScript environment and library that I used for the server-side coding of my project. It was very useful to connect to MongoDB and query the data from my selected datasets.

Web Socket: I used ws as a way to connect Nodejs to the client-side part of the project through JSON objects.

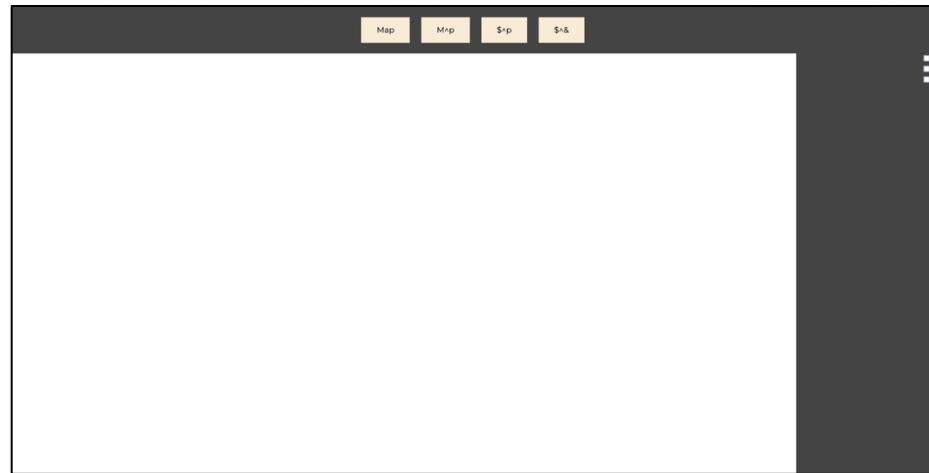
Leaflet: I used Leaflet as part of the frontend of my project in the first two data visualisations. It is an open-source JavaScript library used to create interactive maps. I used it to display a map of Canada with circles positioned according to the data retrieved by my server-side queries. Leaflet was relevant for the creation of a map-based data visualisation that I wanted to incorporate in the project.

Konva: Konva is a JavaScript 2D canvas library that I used to create two other data visualisations. It is a class-based library used to create visuals. I wanted to create 2D visuals, and I was curious about libraires other than p5.js which made me want to try Konva.

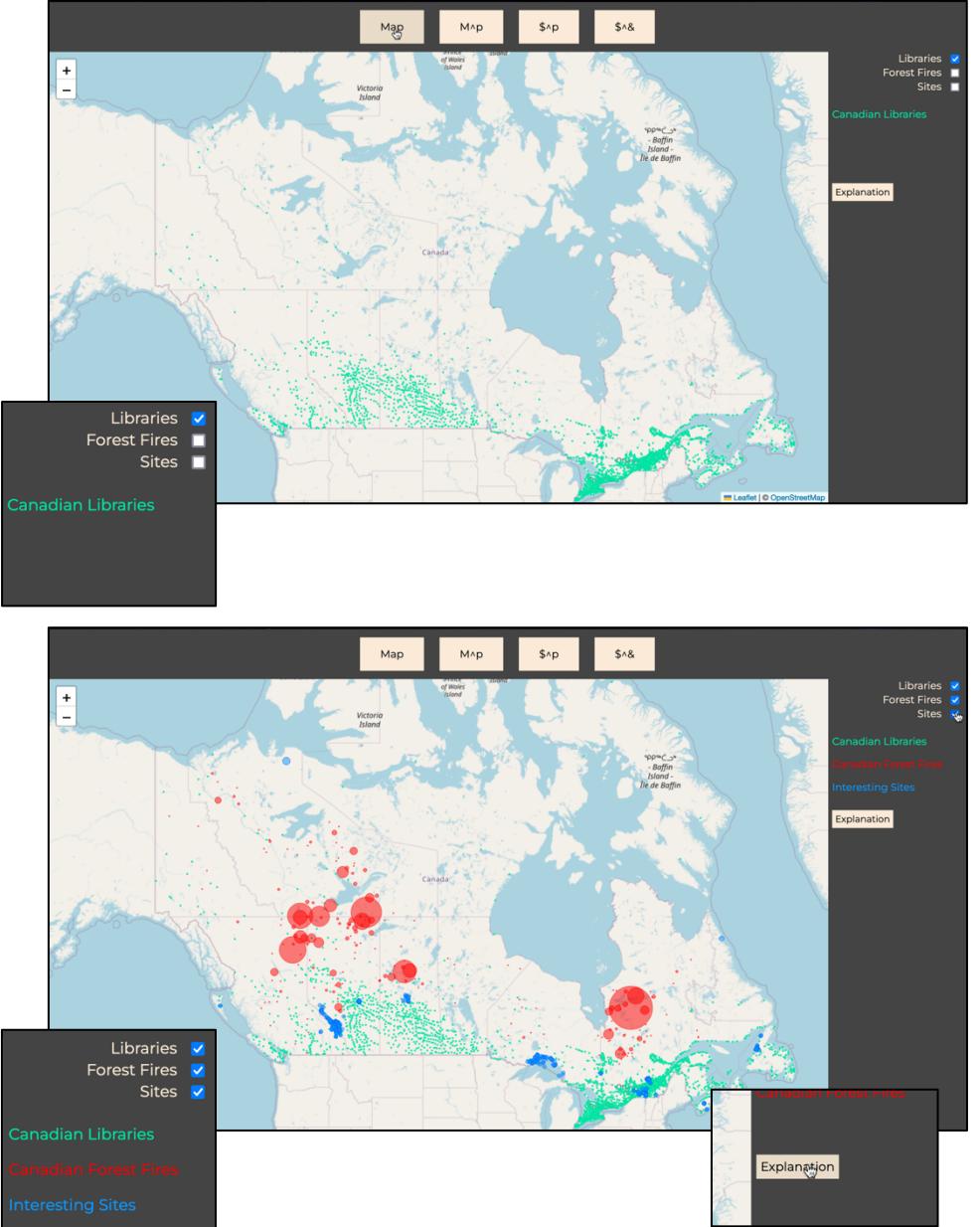
Bitmap and Audacity: For one of my visualisations, I used the data to create an image very similar to a soundwave and I wanted to create sound from that. The solution I came up with to do that was to take an image of the visuals I created, converted the png to a bitmap and then import it to the audio editing and recording app Audacity as raw data to get an audio that I could than save as an mp3 to be used in my project. This technique was very useful as it created a clean and working outcome.

Features

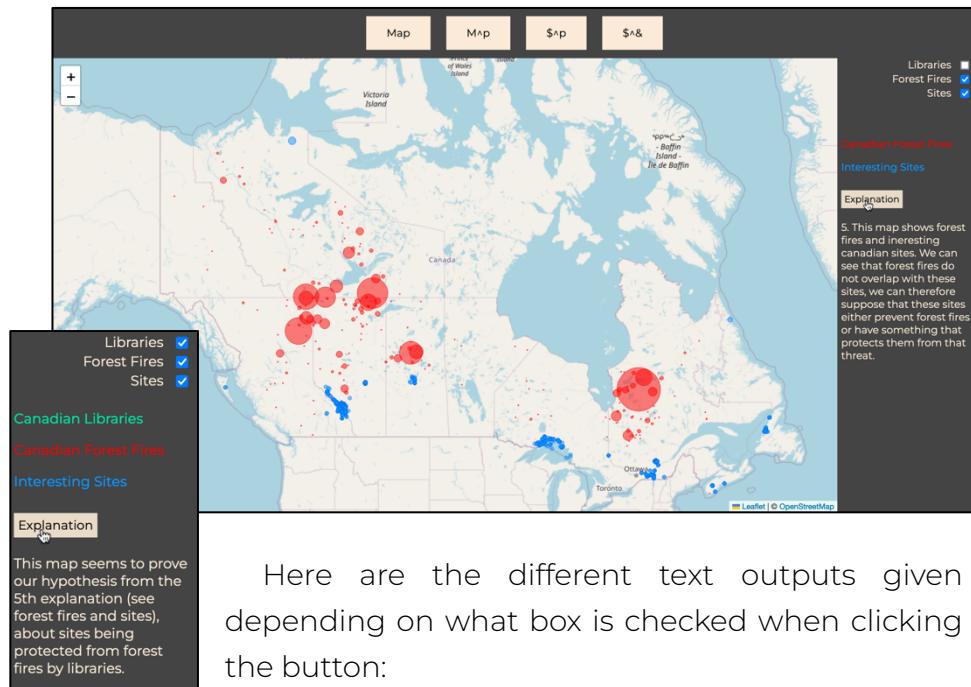
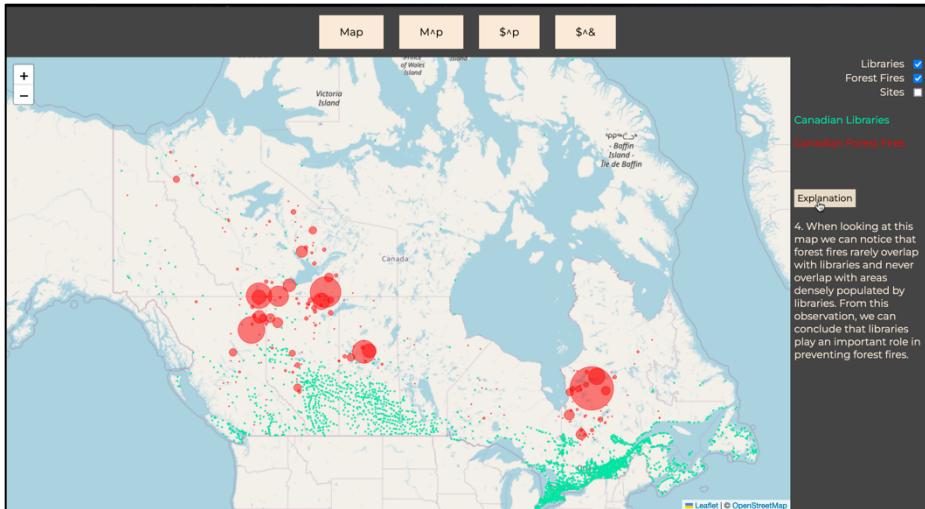
The first feature of this project are the buttons used for the navigation of the project at the top of the page. We have four buttons that are used to explore the four visualisations in order of most scientific looking to most abstract. To convey what type of visualisation the user will see by clicking on each button, I thought about what to write on them and came up with the idea of changing the letters to signs. This serves as a parallel to taking away the meaning of the data through my visualisations. The original word used for the buttons is “Map” as that is what the first visualisation is based on.



When clicking on the first button, we are brought to the first visualisation. This visualisation starts with a map centered on Canada showing Canadian public libraries. I used checkboxes for the user to select what they want to see on the map and depending on what is selected, a pseudo-legends also appears under the checkboxes.



The next feature of this visualisation is the explanation button. This button is where the nonsense text accompanying the map appears according to the selected checkboxes.



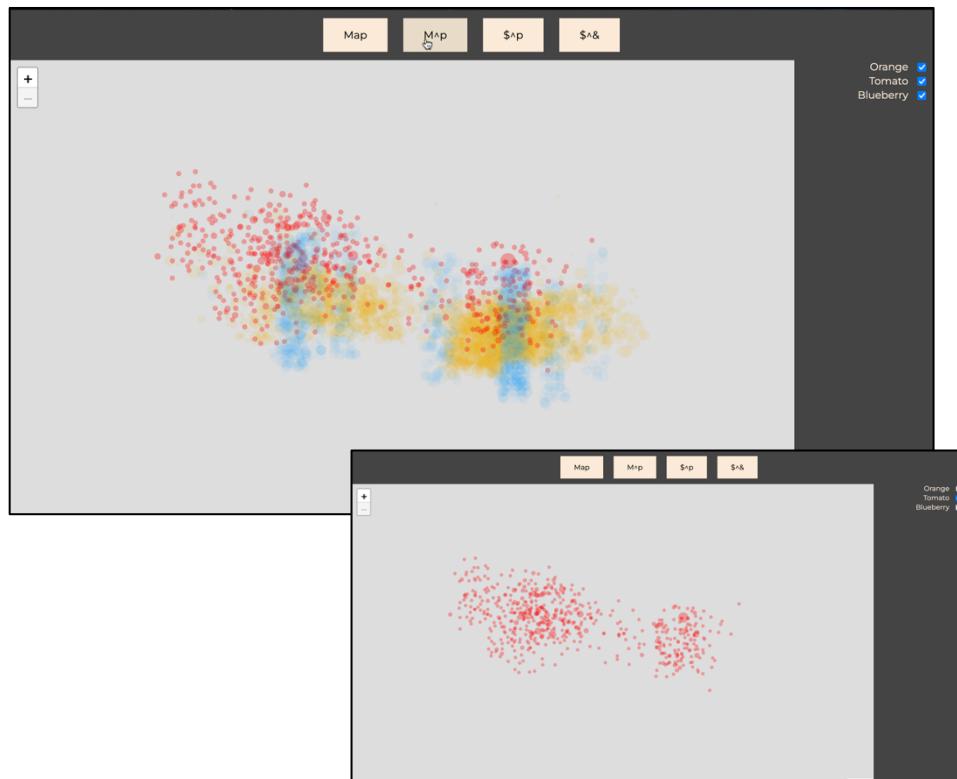
- None: "A map :)"
- Libraries: "1. This map shows public libraries across the country."

- Forest Fires: "2. This map shows forest fires that burned in 2023 with their size being represented by the size of the circles."
- Sites: "3. This map shows different interesting Canadian sites such as historic sites, campgrounds, waterfalls, and many more."
- Libraries and Forest Fires: "4. When looking at this map we can notice that forest fires rarely overlap with libraries and never overlap with areas densely populated by libraries. From this observation, we can conclude that libraries play an important role in preventing forest fires."
- Forest Fires and Sites: "5. This map shows forest fires and interesting Canadian sites. We can see that forest fires do not overlap with these sites; we can therefore suppose that these sites either prevent forest fires or have something that protects them from that threat."
- Libraries and Sites: "6. In this map, we can see that libraries and interesting Canadian sites like historic sites often overlap with libraries or are close by except for a few exceptions. It seems right to believe that libraries are the cause for the presence of historic milestones and other Canadian wonders."
- All: "This map seems to prove our hypothesis from the 5th explanation (see forest fires and sites), about sites being protected from forest fires by libraries."

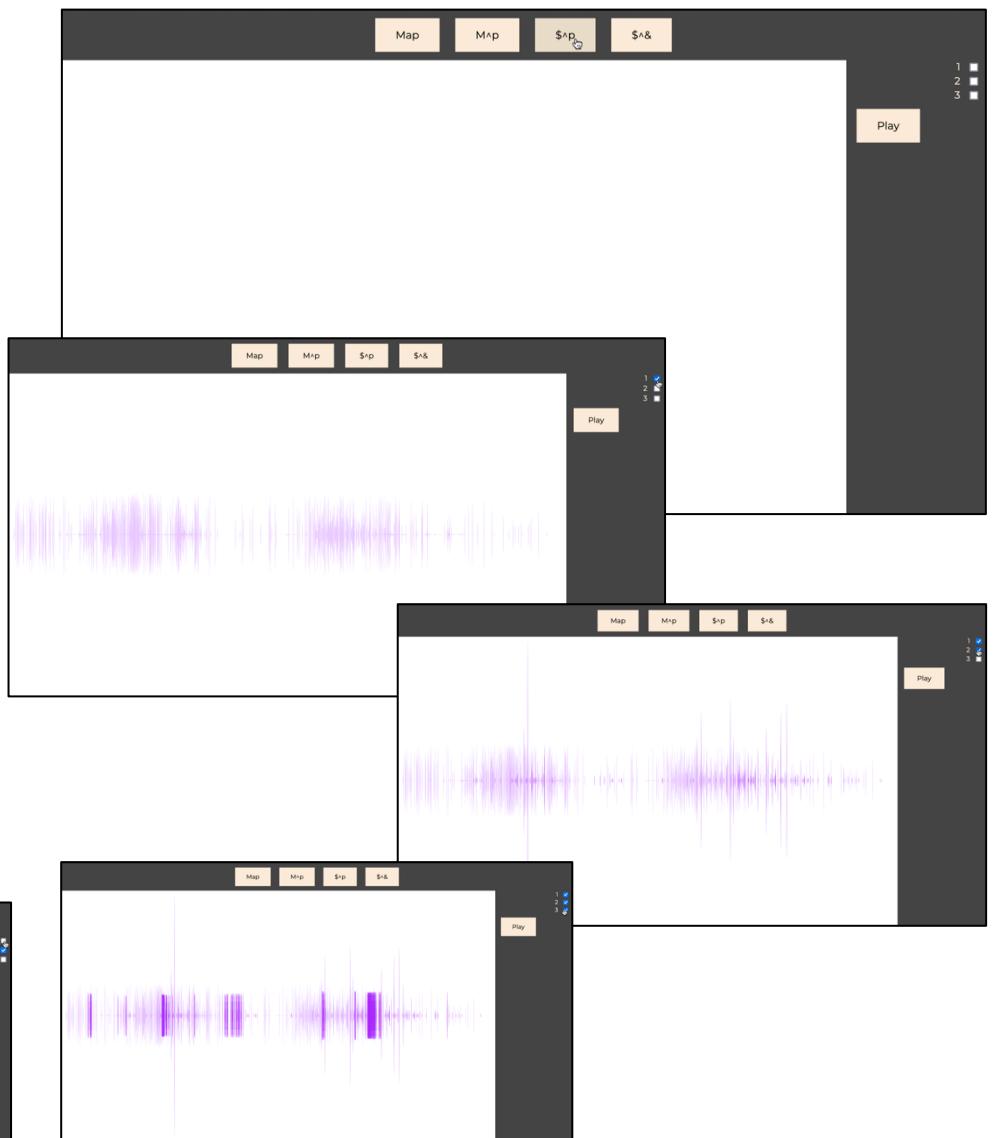
After finishing the project, I realized that the use of the word "sites" as a checkbox description is not very clear. The dataset I used here was found on Parks Canada's website and was titled Interest Points. It is composed of historic sites, campgrounds, waterfalls, parking, and a lot of other types of places which

makes it hard to find a word for. However, I could have called it “Canadian Sites” to clarify at least a little what these points were about. I did give a simple explanation when looking at the “Sites” explanation.

The next visualisation was similar to the first one in many ways. I also used Leaflet for the map but changed the background layer to a grey layer instead of using Open Street Map. I still used checkboxes to toggle the different datasets on and off, but I changed the names to fruits or vegetables of the colour of the points. This time, there is no explanation, but the points position is still similar to the previous map’s layout. The main go to different is that all the datasets are visible from the start because all the boxes are checked.



The third visualisation is the sound one. This one starts with no visuals and no box checked and a “play” button. The button will play the sound files associated to all the selected boxes and the visible soundwaves.



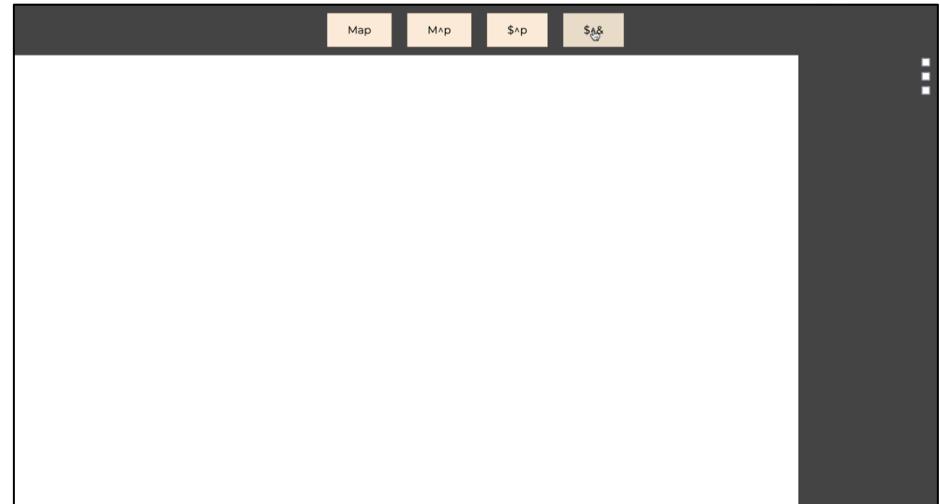
I modified the darkness of the purple for each soundwave to be able to distinguish them a little from each other and to create some sort of depth to the visuals.



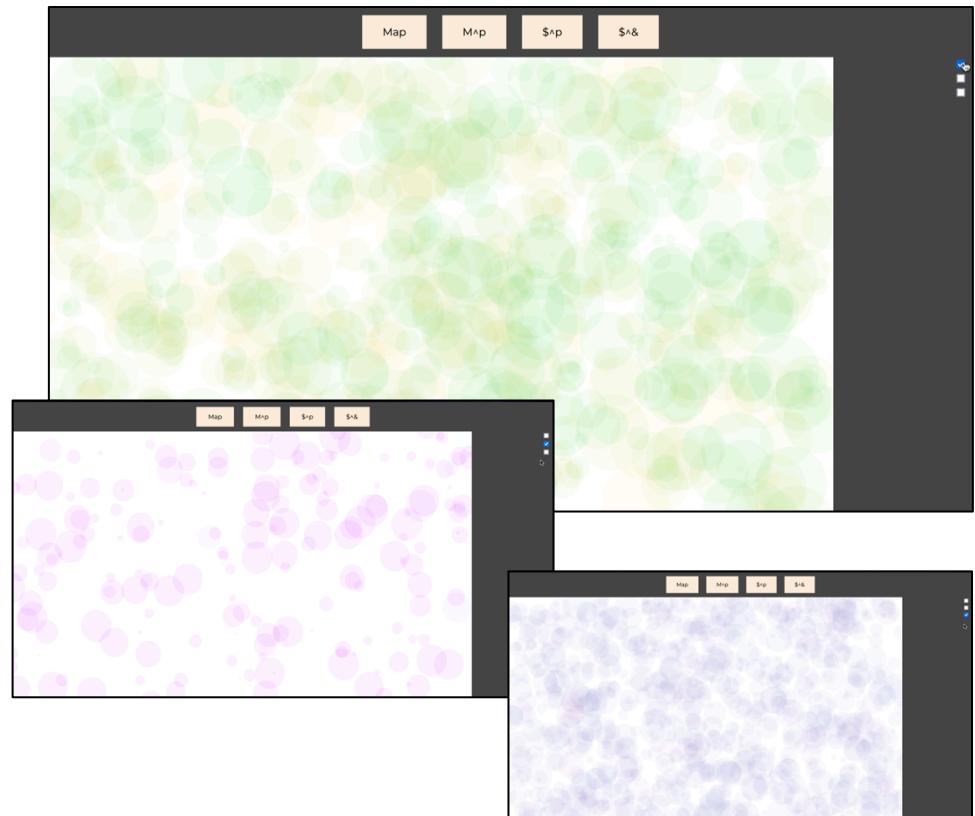
In the example above, when pressing “play”, all three sound files will play together.

Another feature of this visualisation is that whenever a box is checked, the sound of corresponding to the box that was just checked will play, however, I did not manage to make the sound of all the checked boxes play, that is why I felt the need to have the play button for that purpose.

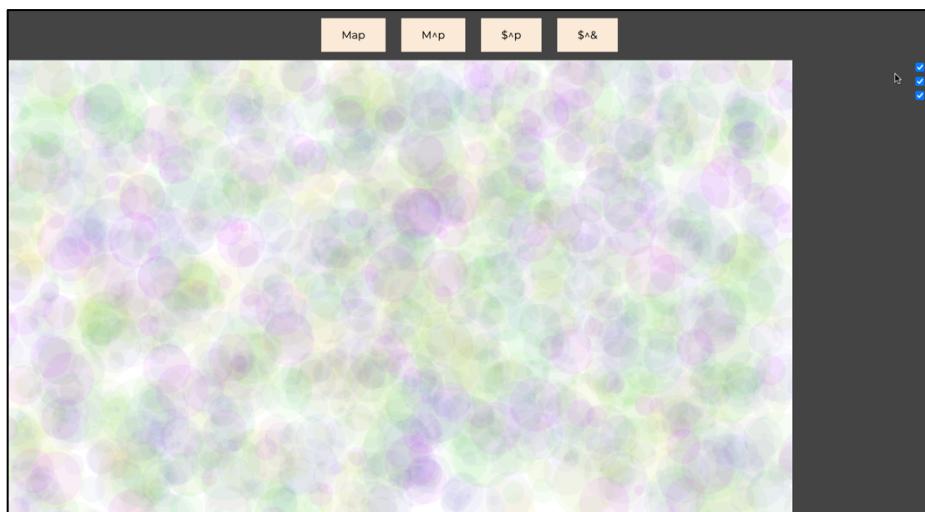
For the last visualisation, I created circles for each dataset with either their colour or their size being related to the dataset they represent. These circle move around randomly which creates a fun moving image.



Just like the other data visualisations, the user can toggle the dataset on and off by selecting and unselecting the checkboxes.



For this one, I removed checkbox legend altogether as I am not trying to say anything. A little detail about this visualisation is that if the user selects a box without clicking on any button when loading the page, this visualisation will be displayed by default.



Features I Do Not Have

In the first visualisation, I wish I could have figured out a way to load the new explanation whenever a new checkbox was selected or unselected but looking at every checkbox rather than have the user click on the explanation button. Although I expected that, I noticed that many people I showed the project to didn't click on the explanation button or didn't realise the explanation would change every time their selection changed.

Similar to this, I wish I could have made the sound play for every selected checkbox every time a checkbox is selected or unselected rather than have to press the play button.

The last feature I would have liked to look into would be to have some kind of explanation of the whole project somewhere, but only once the user has gone to all four visualisations. I would have liked to incorporate a sentence explaining that although data seems unbiased, it does not mean that people could use it to say something false. I hope that even without this, the project still carries this explanation to the users.

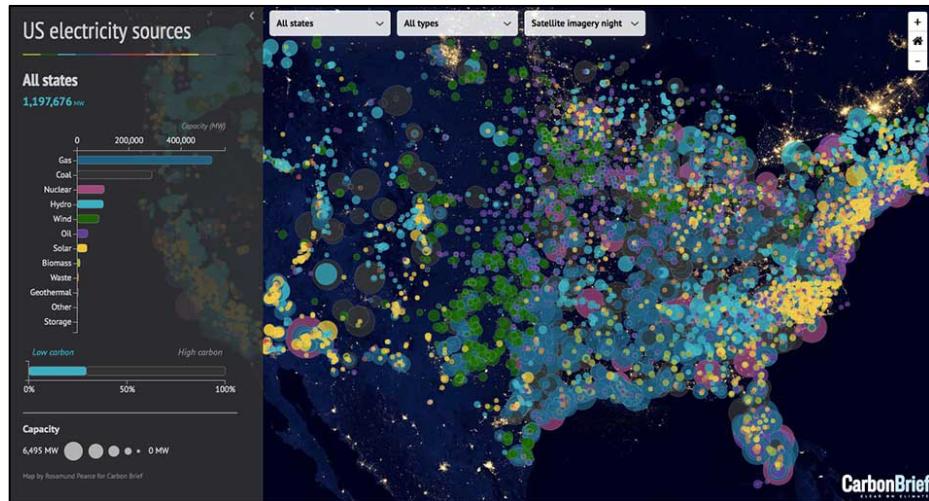
Intention vs Realisation

Looking back at my proposal, I realised that the starting idea of this project was to compare paper books and e-books using correlation and misuse of data. Although a part of the project was to look at data manipulation and making data say something that it is not meant to be, the book versus e-book was still meant to be the core of the project. My realised project is now strongly looking at data misuse but totally left out books versus e-books. I still look at libraries as a base subject for the project, but it is no longer part of the goal of the project. This change can be explained by the difficulty of finding data that is of interest and that contains the fields one wants to explore. By using a map as my base visualisation, I needed to find coordinates, locations, and because of that, finding a dataset on e-books that would fit those requirements was very difficult. I also decided to add the abstract visualisation early on, but after my proposal, because of conversations with others as a way to

create a parallel with data misuse and as a more artistic aspect of the project. I would say that the final concept is a refined version of the original idea where what I wanted to talk about shifted from one point to the other. The first visualisation is relatively similar to what I was intending on doing in the proposal with less datasets to explore, but I extended the project further with more visualisation and a deeper exploration of data usage on a personal level.

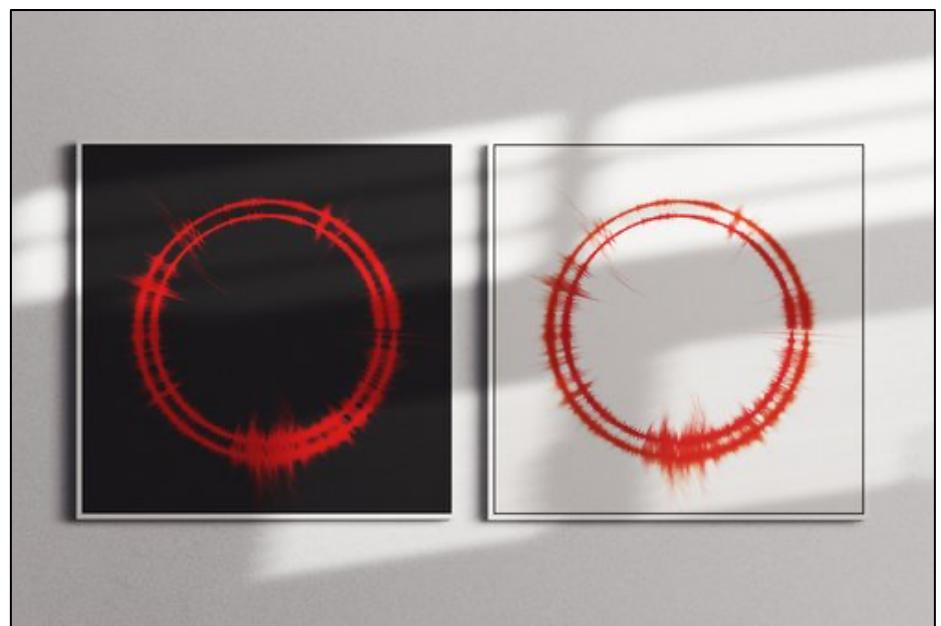
Inspirations

Inspiration for the map was from looking at different map-based data visualisation that discuss different topics. The U.S. electricity sources was a big influence in deciding to have a map that only looked at Canada instead of the whole world. It was also because finding worldwide data is quite complicated.



<https://www.carbonbrief.org/mapped-how-the-us-generates-electricity/>

Another inspiration for the sound visualisation comes from Tiziana Alocci's Necessity Collection – Visualising Sound's Stay There. This piece shows circles with lines of different length which inspired me for my third visualisation. After making it and looking at it, I realised that it looked like a soundwave and with multiple people telling me to try and create sound from those, I used them as soundwaves to transform my data into sound.



<https://www.tizianaalocci.com/home/necessity>