Feel the data - project description

Title: Feel the data

1-line description: A machine learning-powered platform to make users feel the evolution of data through time and hear the impact of such data through emotion

Description: A machine learning-based data sonification and visualization web app to map data to music and image, generating a ’data experience. The project is meant for anyone that is able to interact with a web app, from very young people (as it is almost usable just by looking at the images) to older ones

Our goals are:

- to educate the highest number of people possible: to inform the young generations and to get detached people interested in today’s issues
- make an extendible platform
- to make data understandable without having to know specific concepts

Challenges, accomplishments, and lessons learned:

What kind of challenges did you run into for this project?

One of the main challenges we run into has been not being able to work physically together and divide the work in such a way that it could be easily merged.

Another issue was automatic music composition. At first, we wanted to use a model (Riffusion) that created complete musical loops using spectrogram images to generate sound. But after some time we understood that it was too much work for the time we got. So we decided to go with Magenta which has libraries and models easy to use and understand.

Lastly, we run into some issues using a framework that allowed us to have a big particle system that could run in a browser without having performance issues. We solved the problem by choosing a vanilla javascript algorithm.

What kind of accomplishment are you proud of?

We are proud of how we merged together our ideas and also used the latest technologies. Although having some problems, we arrived at a more straightforward but, we think, more effective solution. Moreover, we valued a lot the testing part and, for example, we made sure that even if OpenAI didn’t work we had backup images to not lose the visual aspect of the app.

What did you learn during the project?

We learned a lot about how to make an idea that we were all happy about into something possible to do and to better understand the small actions to take. We also learned how important it is to always take a step back and see the project from the point of view of someone that has not been involved in the creation of the app, as in this way we can be sure that the message is effective.

Technology:

For the map: p5.js, mappa.js, and the Mapbox API

For the music: magenta.js, specifically the magenta RNN and magenta music VAE. We applied the valence-arousal plane concept to map the data to music

For the data: OpenWeather API, specifically the Current Weather Data API and Air Pollution API

For the visuals: plain javascript, the OpenAI Dall-e API, and the concepts of Particle systems and Perlin noise

The whole project is hosted in a Node.js application.

Students:

Eutizi Claudio: particle system and music mapping

Perego Gabriele: particle system and front-end development

Plandolit Ricard: automatic music composition and visuals

Zezza Federica: map and menu front-end development

Links:

http://feel-the-data-rick1080p.onrender.com/

GitHub - claudioeutizi/feel_the_data: Creative Programming And Computing (CPAC) Project. AY 2022/2023, M.Sc Music And Acoustic Engineering, Politecnico di Milano