NASA INTERNATIONAL SPACE APPS CHALLENGE

F.E.S.

NA-Sound 4Everybody

Challenge: Immersed in the sound of space

Music saves you from the silence outside…

October 2023

The Problem

Can you hear sound in space?

"*Sound doesn't exist in space, at least not the way we experience it on Earth. This is because sound travels through the vibration of particles, and space is a vacuum. On Earth, sound mainly travels to your ears by way of vibrating air molecules, but in near-empty regions of space there are no (or very, very few) particles to vibrate – so no sound.*"

2D images and videos coming from outer space arrives to us without any sound, so these resources cannot be enjoyed by everyone (think about visually impaired people). The sonification of such images and videos can enrich the experience for people in general and allow blind people to enjoy them too.

This solution could be applied for multiple purposes:

- Educational, students can find lectures more appealing
- Attract people to science in general
- Artistic, music is enjoyed by the majority of people
- Inclusive for the ones that have vision problems

Our solution: from raw video to music

The approach was to extract frames from .mp4 Hubble space telescope's videos, analyze them through "OpenCV" library and generate audio from the relative data.

For each frame we extracted a palette of four predominant rgb colors through "Color Thief" library, converted them into hsv, extracted the hue value of one of them and mapped it to a note.

After analyzed the entire .mp4, we iteratively generated the notes sinusoidal signals and merged the audio and video together with the "moviepy" library.

Portal (NA-Sound4Everybody)

The Portal has been developed in javascript with the aid of NodeJS and the ReactJS library.

The layout has been designed to be fully responsive and user-friendly, composed by the following components:

- Interactive background
- Navbar and Footer
- Video player (contains the sonification generated)

The portal is not yet available online, but in the future it will be hosted on a public domain.

Public Events

In the future we would like to advertise space data to the communities by including our sonifications into public events.

This could be a great way to inspire and captivate future engineers, astronauts, scientists.

Roadmap

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DONE

- Project Analysis
- Web Portal
- Color values extraction
- RGB to Frequency assignation

IN PROGRESS

- Object detection and an eventual tracking system
- Frame to frame variation analysis
- Linking of Portal and Core together
- Brightness to octave

FUTURE DEVELOPMENT

- Harmonizing every feature together to create a pleasant layered melody
- Eventual sonification of space anomalies, such as solar storms etc.
- Portal hosting on a public domain

Our Team

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Scan the QR to view our linkedin profiles