Immersed in the Sounds of Space

Team
Solo Squad

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Outline

- Sonification
- Data from Space
- Solution Algorithm
- App Working
- App User

Note :: Question and Answers Session is at the END.

Please write down your questions.

DON’T interrupt during presentation. Thanks !

Sonification

Sonification is the process of representing data or information through sound.

Space data translates astronomical information into audible sounds, enabling aural exploration of the cosmos.

Data from Space

Electromagnetic Waves

Gravitational Waves

Plasma Waves Cosmic

Microwave Background (CMB) Radiation

Solar Wind Waves

Magnetospheric Waves

Solution Algorithm

The **Input Data** should be a Tensor

Slicing each Dimension of data

Cropping Square from each Dimensions

Computing Mean from each Square

mean = (Sum of all pixels intensity) / (Total pixels)

Continues …

Solution Algorithm

Applying Min-Max on Mean of Square

normalized_mean = (mean - min_val) / (max_val - min_val)

Instrument Sounds

$$y(t)=A\sin(2\pi ft+\phi)$$

Continues …

Solution Algorithm

Choosing Instruments

closest_amplitude = min(amplitudes_i, key=lambda x: abs(x - mean))

Sound Append Sequently

Exported as **.wav** file.

Algorithm End…

App Working

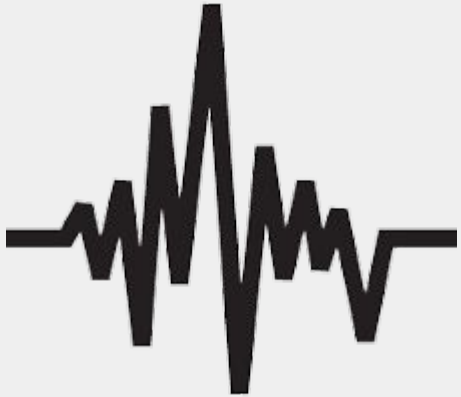
This is CLI Executable

Use following command line arg to run

main.exe *file_path size_of_square*

speed_of_audio amplitude

show_summary



Continues …

Command Line Arguments

Arguments	**Range and Limits**
file_path	**String** Complete file path like ./images/example.tif
size_of_square	**Int** like 10, 25, 50 100 etc
speed_of_audio	**Float** like 0.25, 0.5, 0.75, 1 etc
amplitude	**Bool** 1 for max 0 for min
show_summary	**Bool** 1 to show and 0 to avoid.

App Working End…

Output

- Constant Hash
- *audio length = size_of_square x audio_length*

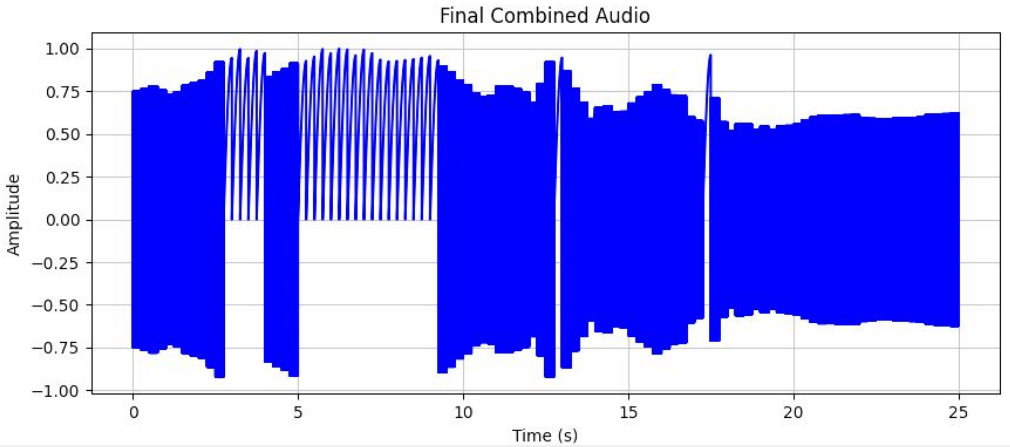
Deciding Audio length is Crucial by Shrinking you Lose Data.

eg: for a 100 MB data the audio length should be 1000 sec.

Continues …

Output Command :: *main.exe ./e3.tif 100 0.25 1 1*

shape (6780,7071,3)



Output End…

App User

- Engineer
- Developer
- Analyst

For Performance and Precision you need C.

Questions and Answers Session

Thank You All

Jadu jayee ga pr jadu nhi jayee ga