

CHROMESTHESIA

<IntroFilm>

WHAT A GREAT SONG DOES TO YOUR EARS ...

... I WANT TO DO TO YOUR EYES.

THE MEMBERS I NEED IN MY BAND FOR THAT:

- A WORLD BASED ON FREQUENCIES' AMPLITUDES
- FFT AND SPECTRAL FLUX ANALYSIS
- OCULUS QUEST
- DECISIONS

AND NOW HOW I CONSTRUCTED THIS COMPOSITON

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A WORLD BASED ON FREQUENCIES' AMPLITUDES

A VISUALLY PLEASING EXPERIENCE MADE UP OF A SONG'S FREQUENCIES

- IMMERSIVE, ALL SURROUNDING EXPERIENCE
- FREQUENCIES' AMPLITUDES SHAPE THE STRUCTURE
- BEATPOINTS AFFECTING THE STRUCTURE

A FUN WAY TO EXPLORE AND LEARN ABOUT SOUND AND FREQUENCIES

- HOW AUDIO EFFECTS SHAPE THE SOUND
 - - *REVERB AND CHORUS EFFECT*
- WHAT FREQUENCIES MAKE UP THE SOUND
 - - *MUTE AND SOLO FREQUENCIES*

A WORLD BASED ON FREQUENCIES' AMPLITUDES

< VIDEO OF THE TUNNEL GRID >

< PICTURES OF THE COMMAND CENTER >

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FFT AND SPECTRAL FLUX ANALYSIS

FAST FOURIER TRANSFORM

- AMPLITUDES FOR THE FREQUENCIES OF A SOUND AT SPECIFIC TIME INTERVALS

→ LINEAR REPRESENTATION OF THE AMPLITUDES OF A SAMPLE REGION AT A GIVEN POINT IN TIME

SPECTRAL FLUX

- SUDDEN, LARGE CHANGES IN A FREQUENCY'S AMPLITUDE

→ DEFINED BY TIME AND RELATIVE CHANGE OF THE AMPLITUDES

FFT AND SPECTRAL FLUX ANALYSIS

MOST IMPORTANTLY

→ PRE-PROCESSED!

FFT AND SPECTRAL FLUX ANALYSIS

WORKING WITH THE DATA

FAST FOURIER TRANSFORM

- NOTES ARE LOGARITHMICALLY SPACED
 - LOGARITHMICALLY STAGGER FFT WHEN APPLYING DATA TO TUNNEL BLOCKS
- AMPLITUDES OF LOWER FREQUENCIES ARE MUCH HIGHER THAN OF THE HIGHER FREQUENCIES
 - INVERSE LOGARITHM AND USE AS A SCALING FUNCTION FOR A PERCIEVED REPRESENTATION OF LOUDNESS

SPECTRAL FLUX

- SAVING TIME OF BEATPOINTS

DEVELOPING FOR VR / OCULUS QUEST

OPTIMIZING PERFORMANCE

→ USING PROFILERS TO GAIN INSIGHTS

<PICTURE OF CURRENT PROFILER WITH 9 DRAW CALLS> <PICTURE OF OLD PROFILER WITH OVER 1K DRAW CALLS>

→ INSIGHT GAINED: WAY TOO MANY DRAW CALLS

DEVELOPING FOR VR / OCULUS QUEST

DRAW CALLS

- RENDER PIPELINE LOOKS AT EACH MESH AND DETERMINES WHETHER OR NOT IT HAS AN EFFECT ON THE OTHER MESHES WHEN IT DRAWS A FRAME

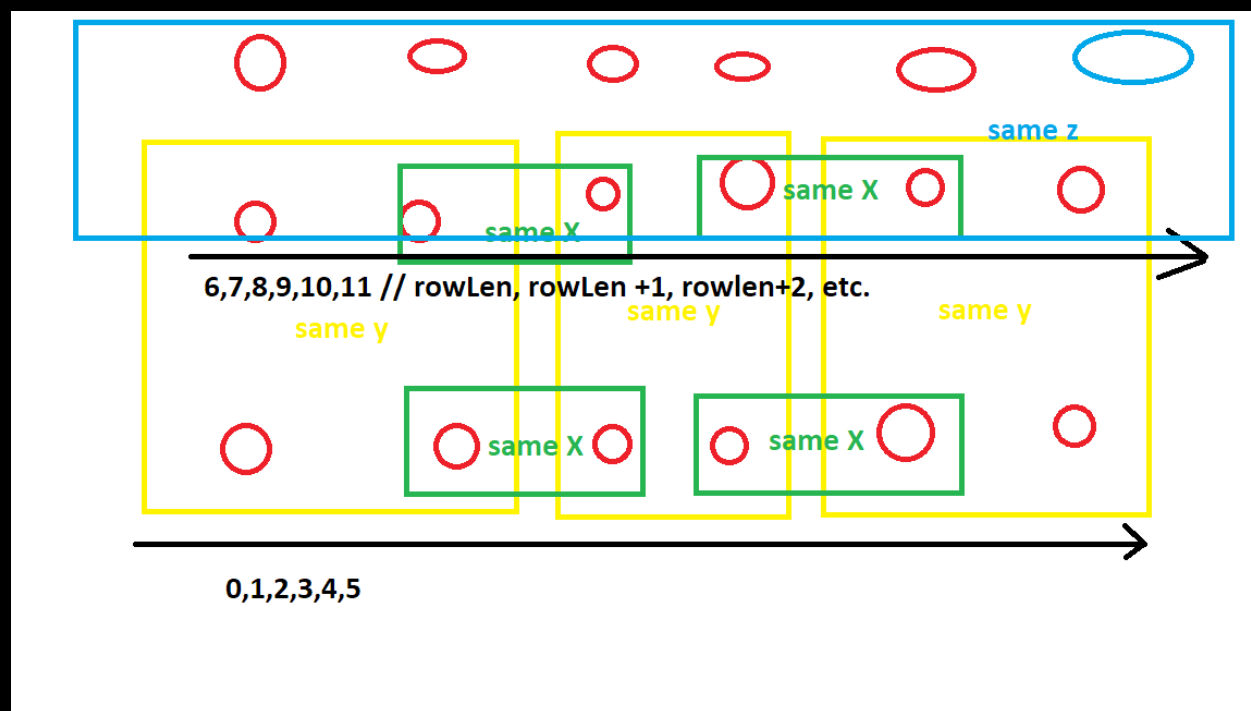
- 32 X 500 INDIVIDUAL MESHES FOR MY TUNNEL

- SOLUTION: CREATE A SINGLE MESH FOR THE TUNNEL

DEVELOPING FOR VR / OCULUS QUEST

CAN'T BE THAT HARD RIGHT?

SEE MY BRAIN MELTING IN ACTION:



DEVELOPING FOR VR / OCULUS QUEST

OPTIMIZING PERFORMANCE

- USING PROFILERS TO GAIN INSIGHTS
- **INSIGHT GAINED: WAY TOO MANY DRAW CALLS**
 - - GENERATING A SINGLE MESH TO REDUCE DRAW CALLS
 - WORKING IN 2D FOR 3D
 - - SCALING AND FEEL IS VASTLY DIFFERENT WITH THE HEADSET
 - INTERACTIONS

Making decisions

- **Inability to incorporate the SoundCloud API**
 - **API only gives streaming URL, but we need to download a file into to game's assets, to "unpack" (decompress) the sound so our time domain is right**
- **Styling: 2 Worlds**
 - **How I hope the "Metaworld" of Chromesthesia is able to sell an emotional high, because of it's counterpart in the "Selectworld"**

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