RODFINALPATCH

3D Sound Spatialization with Headphones

-MOVE THE POSITION OF OBJECT IN WINDOW -OBJECT IS THE POSITION OF SOURCE FROM STARTING POINT

Instructions of Implementation.

1. User opens sound file
2. Press Startwindow to start audio test
3. Press Stop to stop audio test
4. User can choose to loop file

Purpose of this program is to synthesize the spatial feeling of"3D" sound using techniques such as Panning, Distance, and Reverberation. It was very difficult to include HRTF in the program since there are so many data sets. I decided to disregard them and I tried to generalize those values. THough it may not sound perfect for everyone since we all have different shaped heads, the program does a little bit of what its supposed to.

OPEN SOUND FILE TO TEST

open

loop $1

sfplay~

LOOP SOUND FILE

x~ 1

start audio

startwindow

stop

-100<-

Max 19

MOVE UP AND DOWN

min 0

Start point at X=0, Y=0

MOVE LEFT AND RIGHT

-> 100

X-COORD

Y-COORD

When position is Y=20, there is no sound since the value has reached its threshold.

Intensity is loudest at 0, 0 and decreases the farther you are from the starting point

-2.

0.

Simple expressions that calculate values between 0 and 1 in decimals. Used for Distance and Panning.

expr (($i1+100)*0.5)/100

expr $i1/20.

0.49

0.

DISTANCE Panning from front to back, as Y-Coordinate gets bigger (meaning the source is getting farther), 1 is subtracted and the sqrt is taken to keep a constant overall intensity

To get the left channel's amplitude, the right channel's amplitude must be subtracted from a constant 1

!- 1.

!- 1.

Panning from Left to Right

sqrt

wet $1

value of wet (effect) signal (changes as input changes

Extra Volume Control

0.6

sqrt

sqrt

To keep a constant overall intensity, implement a square root of amplitude (makes it clearer)

Combine Sound file with Distance Panning multiplied by Intensity Panning

x~ 1

For intensity panning effects, each channels output level was scaled

x~

x~

freeverb~

Reverberation Object

Include a Reverb Object to add spatial evironment cues

x~ 0.1

dac~