

A stylized illustration of a smartphone with a dark blue screen and an orange top bar. A pink hand with an orange outline is pointing at the screen from the bottom left. The screen displays the text 'COSC 482' and 'Final Project' in large, bold, yellow-orange letters. Below this, the name 'Kalyn Howes' is written in white. The background is a light beige color with various decorative elements: small orange dots, teal squares, yellow circles, and blue lines. On the left and right sides, there are vertical lines with horizontal dashes, resembling a list or a menu. At the bottom right, there are five blue 'X' marks.

COSC 482

Final Project

Kalyn Howes

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PROPOSAL

- **Drum kit simulation**
- **Placed in a galaxy on a stage**
- **Keys on the keyboard are pressed to play different sounds from the drum kit**

- **Changeable stage lighting**
- **Optional metronome backing to play along to**
- **Spherical camera manipulation to move around the stage**

Demonstration



CONCEPTS FROM CLASS

Object Model Viewers & Cameras

- Used downloadable .obj files & Blender, to create the final model
- Incorporated a spherical camera to move about the scene

Lighting

- Used the Phong model for stage lighting
- Focus on diffuse and specular
- Heavy use of rgba

Skyboxes

- Used to create a galaxy-like atmosphere surrounding the stage
- Essentially places a texture on a large cube and places the camera inside of it

UI & Pygame

- Heavy use of UI features with Pygame package
- Recognizes keydown and mouse movements to change lighting and toggle options

CONCEPTS BEYOND CLASS

AUDIO UI

- Used Pygame.mixer module and free .wav files from online
- Includes functions such as:
 - .Sound()
 - .Music()
 - .stop()
 - .play()
 - .pause()
 - .fadeout()
 - .set_volume()

HIGHLIGHTS

- **Audience Reactions**
 - when toggled on, the simulation will display either a sound of applause or a crowd booing seconds after the user stops playing drum sounds
 - the reaction is chosen at random
- **Change in Stage Lighting**
 - toggle for stage lights to change at random when drums are hit

DIFFICULTIES

Hardcoding of Model

- Issues with path implementation on Windows computer to delete drag & drop necessity

Light Location

- Determining where the stage lights were in the model to line up the light spheres

Audience Reaction Timing

- Implementing sound in the Graphics Engine rather than in the UI caused unwanted looping sounds

Searching for Sounds

- Finding good quality, free, and downloadable sounds online took a lot of time



FUTURE ADDITIONS

- Addition of drumsticks that move to the specific drum as its key is pressed

OR

- Drum head/cymbal lights up as a different color when its key is pressed

- Guide for keyboard function that can be toggled on and off
- Lighting animation - stage lights move back and forth, flash, etc.