

CSS551 Fall 2023 Final Project

The Pianist

Team Members:

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Project Explanation

This project introduces an immersive 3D piano simulator, emulating a realistic piano practice experience with distinct sounds for each key. Users engage via a mouse, controlling the virtual pianist's hands to play music. The simulator offers a user-friendly interface, dual viewing modes, and customizable camera angles. Three on-screen control areas: Lights Controller (to control two different light sources on/off and brightness), Change Texture (to select different textures, such as skin color of the hands, decorations, etc.), and Select Sheet (to select different playing tracks) for a comprehensive experience. It aids in music score familiarization and enhances the user's musical journey.

Sketch



From Unity Asset Store: Piano and Digital Keyboard

<https://assetstore.unity.com/packages/3d/props/piano-and-digital-keyboard-216636>

How technical requirements are met

A purpose

This simulator helps users familiarize themselves with music scores and enhances their overall musical journey.

Work with SceneNode graphical objects

The SceneNode graphical object is the pianist, which is a 4-generation SceneNode hierarchy object. We can control the rotation and size of each node of the pianist. In addition, clicking the keys with the mouse will cause the pianist's hand to touch the keys, which is the core of controlling the SceneNode object.

Object interaction

When a virtual pianist's hand touches a key, it will cause the key to be pressed down and produce a corresponding sound.

Illumination

The APP supports two separate light sources. The first is the global light source, which will be placed on top of the piano. The second is the local light source of the piano keys, which will serve as an indicator of the selected sheet. Both of these two can be switched on/off by UI.

Texture

The APP supports two file textures of the hands of the pianist with separate UV maps. The second file texture can be switched on/off by UI.

Two Different Views and Camera Manipulation

The app provides a main view of the pianist's perspective, showing the pianist's hands and keys in the picture. Users can use the 'Alt' key plus a mouse click to control the camera for tumble, zoom, and pan. At the same time, it provides a global view from an audience perspective. The global view will be placed as a small camera viewport in the bottom left corner of the screen.

Tasks and Schedule

Due	Tasks	Notes
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11/24 Fri	<ol style="list-style-type: none"> 1. Build SceneNode hierarchy 2. Scene construction 	The pianist should sit on the chair
11/30 Thu	<ol style="list-style-type: none"> 1. Implement the logic of keyboard-corresponding audio 2. Two camera views and camera manipulation 	Each piano key should emit a corresponding sound when pressed
12/5 Tue	<ol style="list-style-type: none"> 1. Mouse click, hand touch 2. Textures 3. Illumination 	Implement the logic that when the mouse clicks on a key, hands will move and touch the key
12/9 Sat	<ol style="list-style-type: none"> 1. Two music scores 2. Light indicator 	When light hits a key, it instructs the user to press that key
12/12 Tue	<ol style="list-style-type: none"> 1. add some special effects 2. final test 	Submit project !