Elemental Clash

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Introduction to Computer Graphics
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Main Ideas

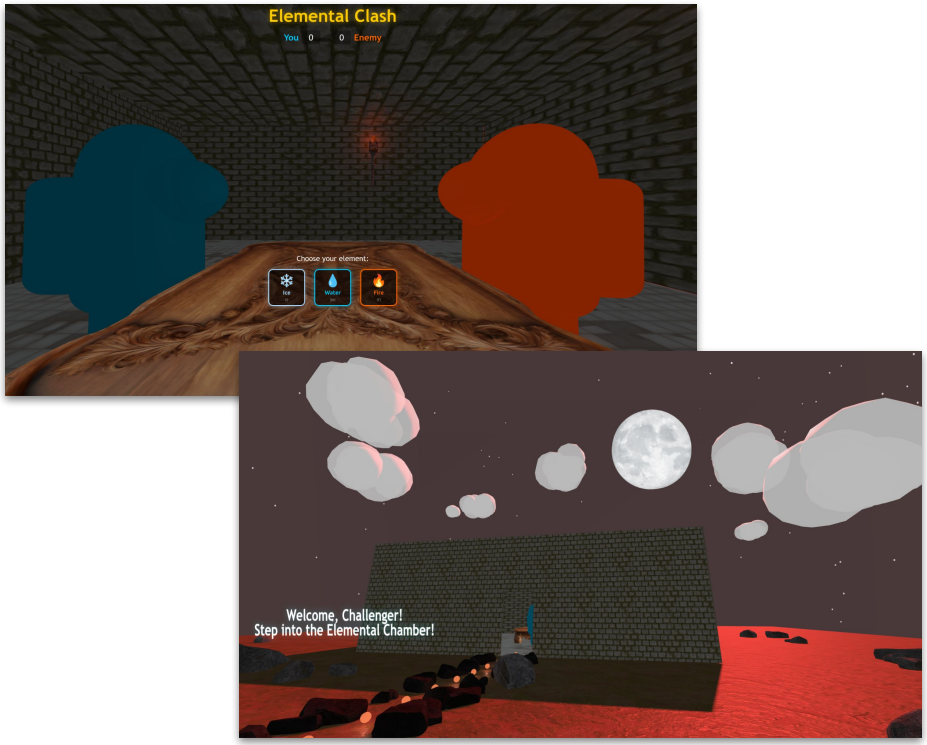
-Rock-Paper-Scissors Style mini-Game

- 3D Open World to Explore

  Using **Keyboard** and **Mouse**

- Move freely through environment

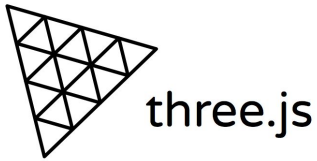
- Interact with other characters



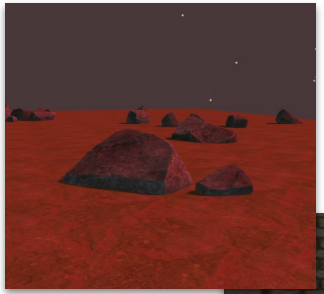
Three.js

The imports structure reinforces the **readability** and **reusability**, keeping the code more **organized**.

{ **CanvasTexture** } → Converts 2D canvas drawings into textures for 3D objects.
{ **Vector3** } → Represents 3D positions and directions; essential for movement, positioning, and physics.
{ **Group** } → Lets you group multiple 3D objects to manipulate them as one.
{ **Box3** } → Used for bounding box calculations, crucial for collision detection and spatial logic.
{ **PlaneGeometry** } → A basic flat surface geometry, often used for floors, walls, or UI elements in 3D space.

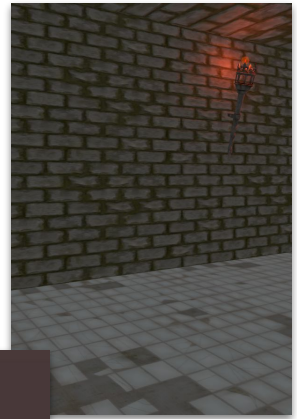


Models and Textures

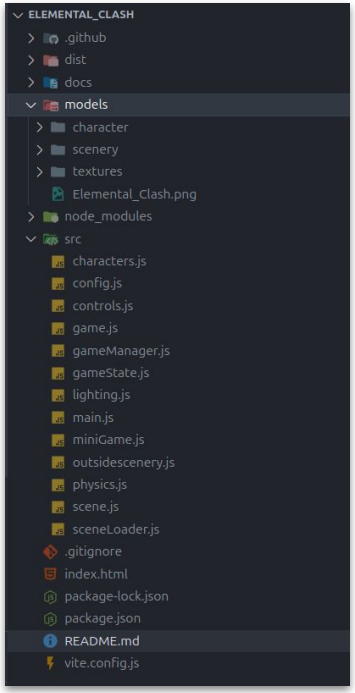


Wall Torch
Rocks
Table
Characters

Ground
floor
Walls
Moon



Organization



THREE.Scene
- Environment (scene.js + sceneLoader.js)
  - createTilesFloor()
  - createWallEnvironment()
  - createMetalCeiling()
  - createTable()
- Outside Scenery (outsidescenery.js)
  - createOutsideScenery()
  - createRocks()
  - addClouds()
  - create Moon()
  - updateMoonBillboard()
- Lighting (lighting.js)
  - setupBaseLighting()
  - addWallTorches()
  - updateTorchLights()
- Characters (characters.js)
  - setupCharacters()
  - animateCharacter()
  - getCharacters()
- Player Controls (controls.js)
  - initControls()
  - updateMovement()
  - updateCameraRotation()

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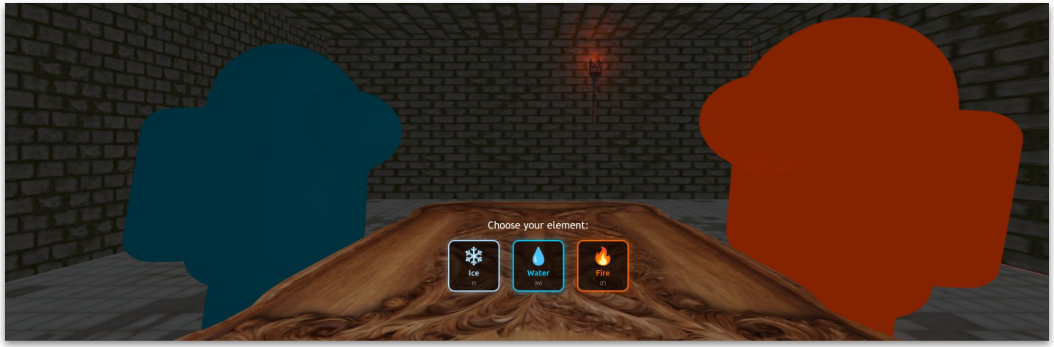
- Game UI & Overlays (scene.js, miniGame.js)
  - createTextTexture() ← scene.js
  - updateFloatingText()
  - createSimpleVictoryDisplay() ← miniGame.js
  - createVictoryOverlayWithCountdown()
  - showDefeatOverlay()
- Mini-Game Logic (miniGame.js)
  - initGame()
  - makeChoice()
  - determineWinner()
  - resetGame()
- Game Flow Manager (gameManager.js)
  - registerMiniGame()
  - registerExitGame()
  - startMiniGame()
- Game Logic and Transitions (game.js)
  - startGame()
  - updateCameraTransition()
  - startVictoryTransition()
- Game State (gameState.js)
  - checkTableProximity()
  - updateGameLighting()
  - onRoomEntry()
- Physics (physics.js)
  - setTableReference()
  - isCollidingWithWalls()
  - isInDoorway()

Animations

Character:
- bobAnimation()
- thinkingAnimation()
- tiltAnimation()
- jumpSpinAnimation()
- slumpAnimation()

miniGame:
- updateCard()
- makeChoice()
-
startVictorySequence()
- showDefeatOverlay()



Animations

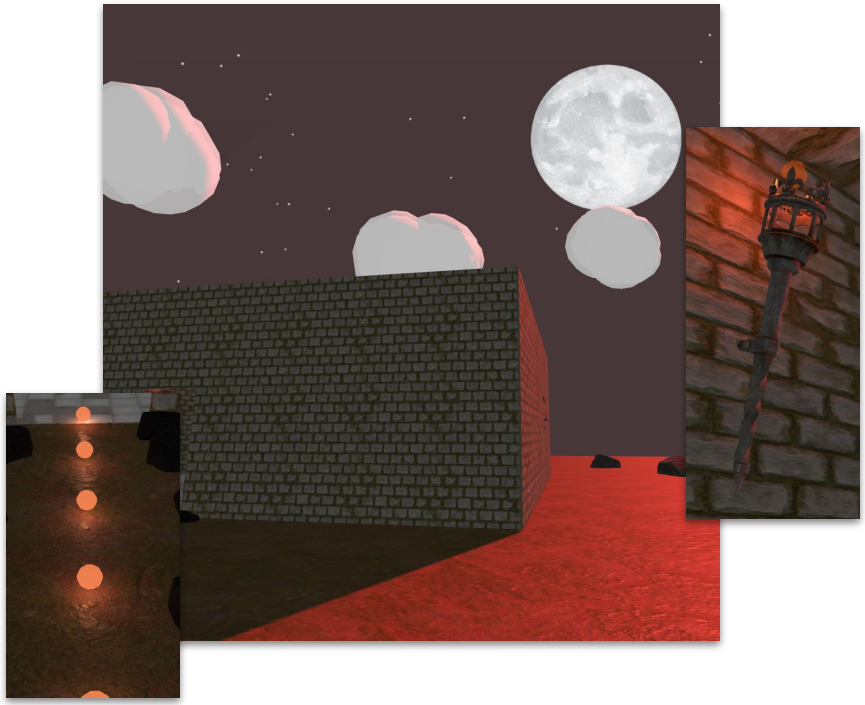
outsideScenery:
- animateClouds()
- updateMoonBillboard()
- updateFloatingText()

Lightning

- THREE.AmbientLight
- THREE.PointLight

updateTorchLights()

- updateMoonBillboard()

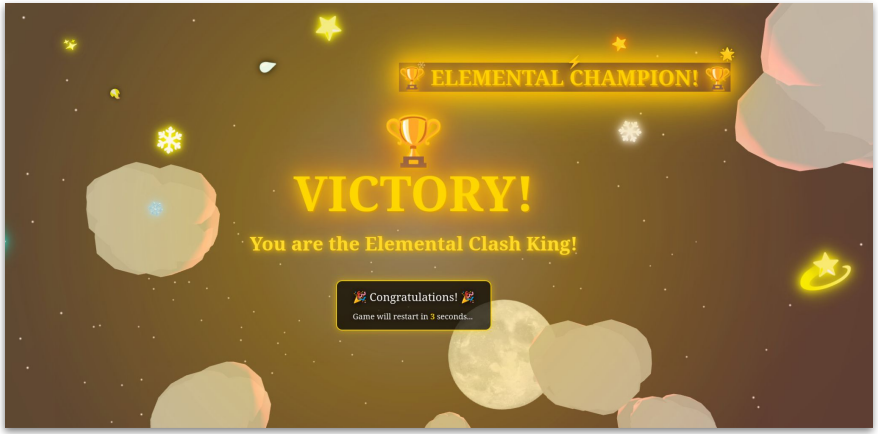


User Interaction

Difficulties

- Creation of Texts and 3D Models using Canvas HTML, converted into THREE.Texture

[Very heavy textures/models]



Conclusion

Main Reference: https://g0ncalocunha.github.io/wizard_showdown/index.html

My Github: https://github.com/DiogoZeca/Elemental_Clash

My Game URL: https://diogozeca.github.io/Elemental_Clash/