

Dinosaurs vs Pirates Tower Defense Game

OSU Online Computer Science Capstone Project

Link: <http://3.91.212.9:3000/>

GitHub: <https://github.com/cfrenchi/capstone>

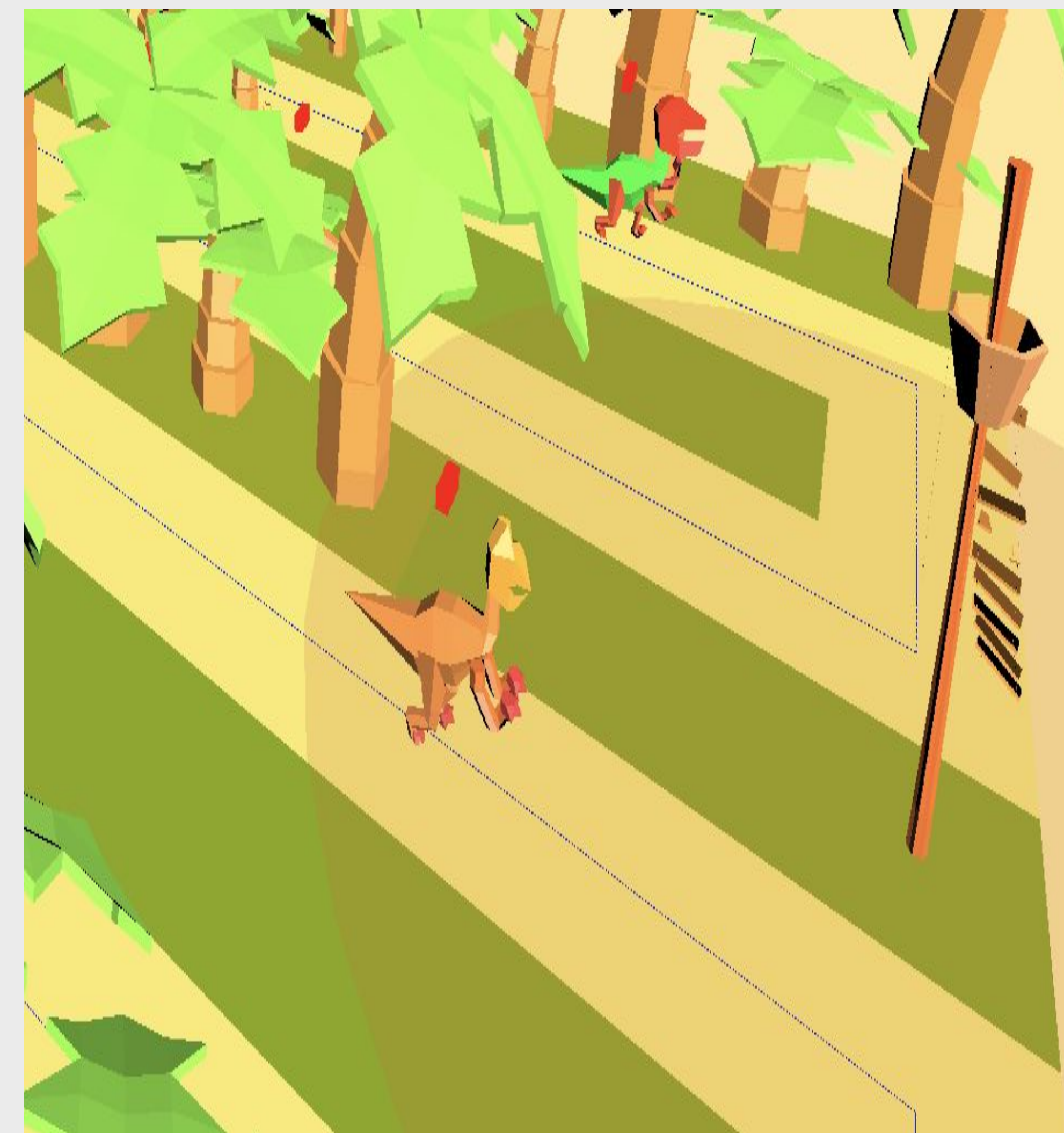
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Description

- This project is a tower defense game. The objective of the game is to stop the looting dinosaurs from stealing all of the pirate's treasure. Towers are placed on buildable land (green tiles) and attack dinosaurs when they walk by. If the dinosaurs make it to the end of the path, the player loses a life. Players only have 10 lives per level, so they must stop those stealing dinos.
- Our group wanted to create a tower defense game that was a little different from the rest and that was in 3D. We had not heard of dinosaurs vs pirates before and we used the javascript library three.js to make it 3D.
- Starting this project, we knew it was going to be challenging and outside of our comfort level. We only had a basic understanding of javascript and had not worked with three.js or done 3D modeling. After the completion of the project, not only do we have a better understanding of javascript, but we also know that we are able to have our abilities challenged and be successful.

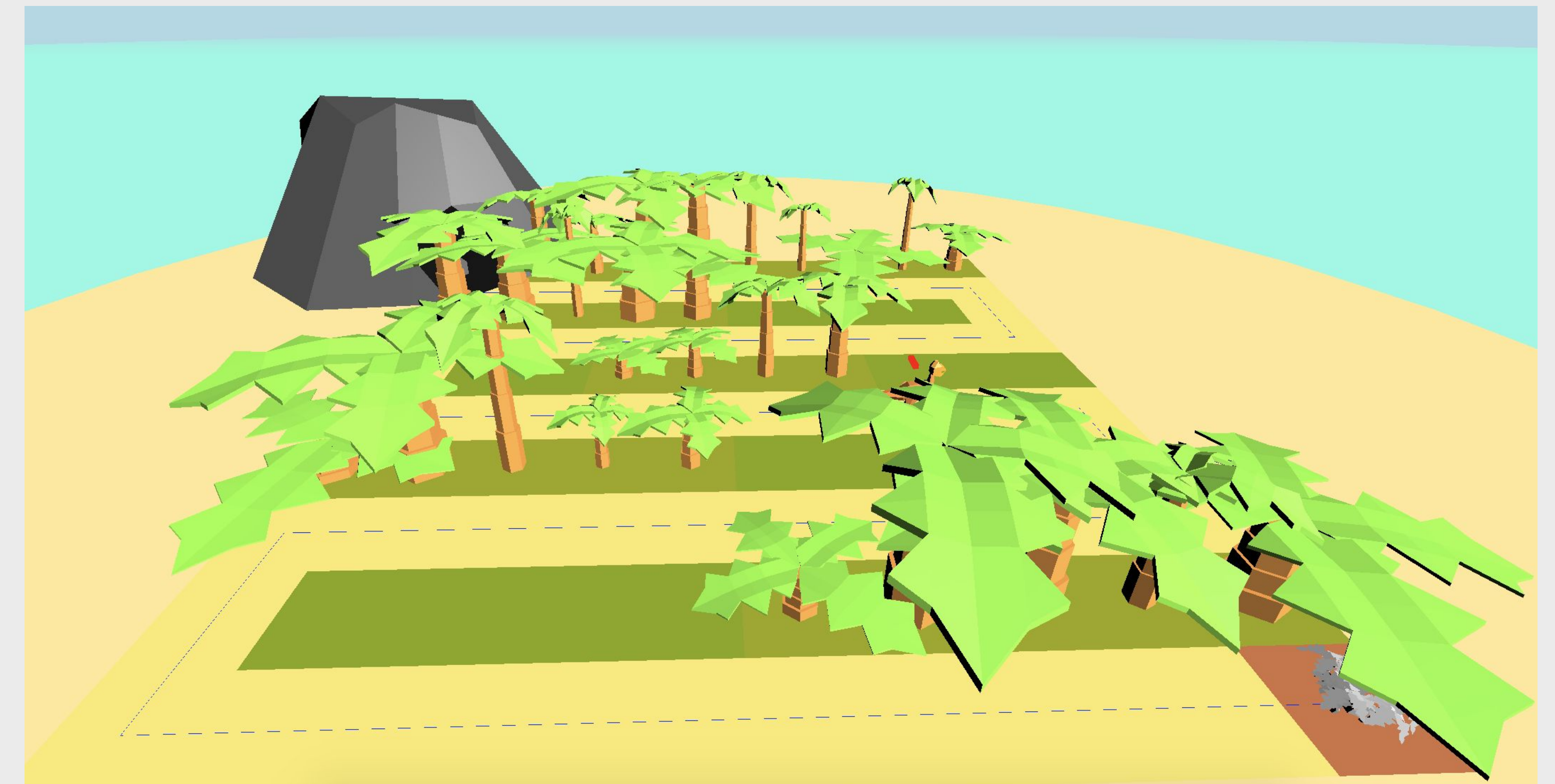


Pictures

Above left: Shown are two of the dinosaur models making their way down the path. The dinosaurs' movement is animated. The red bar above them shows their current health. The tower shown is the musket tower, which is the lowest level tower. The tower's attack radius is shown in red. When a dinosaur is within the attack radius, the tower will shoot a projectile at the dinosaur and decrease its health.

Above right: The first level's map. The dinosaurs start from the cave and follow the yellow path. The palm trees occupy spaces that cannot have towers built on them.

Below right: The code that creates each wave. The delay variable is the time between each dinosaur starting down the path. The number of dinosaurs is increased each wave and raptors and trex are added in later waves.



```
//start the dinos
if( curWave < totWaves && lives > 0){
  //console.log("mapwaves clock", clock.elapsedTime);
  var delay = 0; //delay is time between each dino

  //number of dinos sent down path is same as wave number
  for( var i=0; i<curWave; i++ ) {
    //add an ovi for each wave number until 8
    if( curWave < 8 ){
      addOviGLTF( scene, dinos, delay, testPath );
      delay += 500;
    }

    //add a raptor starting at wave 4
    if( curWave > 3 && curWave < totWaves ){
      addRaptorGLTF( scene, dinos, delay, testPath );
      delay += 500;
    }

    //add more ovi starting at wave 7
    if( curWave > 6 && curWave < totWaves ){
      addOviGLTF( scene, dinos, delay, testPath );
      delay += 500;
    }
    delay += 1500;
  }

  //add 2 trex for final wave
  if( curWave == totWaves - 1 ){
    addTrexGLTF( scene, dinos, delay, testPath );
    delay += 5000;
    addTrexGLTF( scene, dinos, delay, testPath );
    delay += 5000;
    delay += 5000;
  }

  //save game after the wave
  if( lives > 0 ){
    saveGame();
  }

  curWave++;
}
```

Implementation

- This project was created using javascript, html and css.
- The javascript library three.js was used extensively to create this game. three.js served as the backbone to creating the 3D environment of the game. Players are able to move their perspective around using the mouse and can view the map from many different angles.
- The 3D models were created with blender and imported into the game with WebGL. This allowed for the rendering of the models as well as the animations.
- The javascript library tween.js was used to handle the movement of the dinosaurs along the path. This allowed for smooth movement of the models in the environment.
- Music is from www.bensound.com and game noises are from soundbible.com.
- Node.js and Amazon Lightsail are used to host the program.