



The World's Greatest Race

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Overview

All materials were products of Epic Games Unreal engine or were made specifically from 3rd party apps with group members originally created for the purpose of completing the project.

Tools

1. Unreal Engine 4 - Game creation and everything that entails.
2. World Creator - procedurally generated terrain builder

Goals/Objectives

The main goal is for players to race and come in with the best time by racing through the environment and dodging obstacles. There will be hazardous conditions like debris falling and lava flow.

Modeling

The virtual environment is a volcano that is active. Rocks line the environment while portions of the map have smoking volcanos.

The rock asset is modular and is used throughout the map. The material was especially constructed to have glowing cracks in it. It is also used towards the end of the map to represent a destructible mesh that has rocks fly everywhere.

There is also a lava asset constructed from scratch that can be applied to multiple meshes such as a plane or rock.

Characters were used from the engine with already pre-built animations. (Will discuss this in more detail in the animation section)

Modeled checkpoints using a particle system.



Lighting

There is a directional light that serves as the main light source. The other lights used are checkpoint fire particle system that emits a light as well as a volcano particle system that has a violent fire at the peaks of the volcanos.

Timers

Timers are used within the checkpoint blueprints to signify when the previous checkpoint was passed in order to activate the next checkpoint. Also they are used for the race itself for lap time and race time.

Keyboard Functionalities

Keyboard functions are how to control the character vehicle with the arrow keys or WASD.

Other keyboard functions are from numbers 0-9 they are hotkeyed to control npc movement from where they are to a target point at the end of the map.

If r is pressed during the initial splash screen the best lap time and best race time are reset to their default values.

Sensors

There is a proximity audio sensor on the fire particles the closer get to them and fade out the further you are away.

There a collision sensors on the car and map as well as a destructible wall at the end of the map.

Again there are time sensors on the checkpoint system.

Input devices

The only input devices are keyboard and mouse functionality.

Avatars/Animation

There are 10 character NPC's that are keymapped to their animation sequences.

The vehicle is animated and controlled through user input.

There are particle animations throughout the map like fire, smoke, lava etc.

Audio



There are audio cues within the vehicle as well as a theme song a for the map.

There is also sound on the checkpoints as well as an explosion at the beginning of the map.

Problems Encountered

One problem is that getting racing ai is very intricate and takes more knowledge and time of the unreal engine in order implement.

Another problem is completing the race and respawn scripts are incomplete with bugs that are hard to find.

Another problem was using cascade editor within unreal engine which makes the particle system. It was tough getting the snow particle to behave.

The character ai was difficult to start but we were able to get it completed.

Shortcomings

Getting racing ai is not as straightforward as regular characters which is why we changed from head to head racing to time trial racing.

Completing the race and restarting at the beginning for faster replayability.

The car script isn't the best it flips over to easily and doesn't get back up without restarting.

Improvements

Improve the car mechanics.

Make the map bigger.

Add race ai and added players with split screen for multiplayer abilities.

Improve the optimization for improved frame rates.