

CSC 165 – Section 1 and 2

Assignment 3 – Game Project

Spring 2024

Report

Fast Track

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INSTRUCTIONS

The goal is to drive from start to finish as fast as possible while avoiding obstacles.

Step 01: Compile Server (run compile.bat in the Server folder).

Step 02: Run Server (run run.bat in the Server folder).

Step 03: In Client folder, edit Client's run.bat. Change the existing IP address to the IP address of the machine that's running the server.

Step 04: Compile Client (run compile.bat in the Client folder).

Step 05: Run Client (run run.bat in the Client folder).

Step 06: Choose the resolution and the window mode.

Step 07: Have fun.

SPECIAL DEVICE REQUIREMENTS

This game can be played with a keyboard and mouse or a gamepad. A keyboard is necessary to properly start the game.

HOW TO PLAY

1. Start the game.
2. In the avatar selection mode press 1 and 2 to switch between available models.
3. After switching to the preferred model, press ENTER to confirm the selection and start the game.
3. Race against an enemy or alone by following the road and avoiding as many obstacles as possible and as fast as possible.
4. Along the way you'll encounter obstacles, which are;
 - a. NPC drivers: Hitting NPC drivers will lower the score, but it won't slow you down. To maximize the score, avoid hitting NPC drivers. Additionally, it is possible to get a negative score if you hit enough NPC drivers.
 - b. Traffic Cones: Hitting traffic cones won't affect the score but it will slow you down, which will increase your race time. To minimize the race time, avoid hitting traffic cones.
5. Once the avatar crosses the finish line. The race is over, and the player may select a new avatar and start again.

Note: The player can turn off Physics to make the game easier by pressing the Spacebar.

PLAYER CONTROLS

a. Keyboard

In Avatar Selection Menu:

- a. 1 – Switch to Avatar 01
- b. 2 – Switch to Avatar 02
- c. ENTER – Select Avatar and Start the game

In Game:

- a. W – Move forward (when physics is off)
- b. S – Move backward (when physics is off)
- c. A – Turn left (when physics is off)
- d. D – Turn right (when physics is off)
- e. Up – Move forward (when physics is on)
- f. Down – Move backward (when physics is on)
- g. Left – Turn left (when physics is on)
- h. Right – Turn right (when physics is on)
- i. Spacebar – Turn on/off physics
- j. J – Start audience animation
- k. O – Stop audience animation
- l. Mouse – Move camera

b. Gamepad

In Game (when physics is on),

- a. Right Trigger – Move forward
- b. Left Trigger – Move backwards
- c. Left Thumbstick – Turn avatar
- d. Right Thumbstick – Move camera

CHANGES MADE TO THE NETWORK PROTOCOL

Modified existing methods to add NPCs and change their location, shape, and texture. NO other major changes.

CHANGES/ADDITIONS TO TAGE

None

GENRE/THEME/DIMENSIONLITY/ACTIVITY

Genre: Racing, Multiplayer

Theme: Street Racing

Dimensionality: 3D

Activities: Fast Driving and Obstacle Avoidance

COMPLETED PROJECT REQUIREMENTS (IN GAME)

Input Controls – Use Keyboard & Mouse or Gamepad.

Networking – Multiplayer and NPCs.

OBJ Models – Player Avatar, Ghost Avatar, and NPCs.

Single Player Mode – Run the game without any other players.

Choose Avatar & Broadcast – Choose Avatar when the game first started or after finishing a race.

Skybox – The sky.

Terrain and Following – The ground.

Lights – Global light, Green Spotlight on Avatar and Red Spotlight on Ghost Avatar.

3D Sound – Background sound, Stationary Car Engine sound (left of player starting position), Player Car starting sound and Honks of NPCs.

HUD – On Main Viewport: Select Avatar View messages, Score, and Time.

Hierarchical SceneGraph – Physics Objects (avatar, stationary car, and traffic cones), Lights, and Skybox.

Animation – Audience/Bystanders at the Start and the Finish lines.

NPCs and AI – NPC drivers in-game. The server must be running and the client must be connected for the NPCs to appear.

Physics and Collision Detection – The Avatar, the Stationary Car, the Traffic Cones, and the Ground.

LIST OF INCOMPLETED REQUIREMENTS

Player selected avatar broadcast – The player can select an avatar but it won't change the ghost avatar of the other clients.

TECHNIQUES USED BEYOND REQUIREMENTS

None

INDIVIDUAL CONTRIBUTIONS

Kaylyn

- Car model and UV unwrapping: Green Car (greenCar.obj and greenCar.png)
- HUD
- Animations
- Documentation

Dakshina

- Input Controls
- Networking
- Car model and UV unwrapping: Red Car (car.obj and car.png)
- Choose Avatar
- Skybox
- Terrain and Following
- Lighting
- 3D Sound
- HUD
- NPCs and AI
- Physics and Collision Detection
- Documentation

CREATED ASSETS & OBTAINED FROM CSC 155/165

Created Assets

- car.obj
- greenCar.obj
- car.png
- greenCar.jpg
- hills.jpg (AI generated)
- hillsmap.png
- NPC.obj

- NPC.rkm
- NPC.rks
- npc.png
- npc.jpg
- guyRED.jpg
- guyRED.png
- guyGREEN.jpg
- guy.obj
- guy.rkm
- guy.rks
- JUMPguy.rka
- WAVEguy.rka

Textbook Assets

- here.wav (not used)
- ocean.wav (not utilized)

EXTRA PERMISSIONS

Skybox: “skyLines”

Source Link: https://www.freepik.com/free-vector/sunset-anime-cloud-vector-cartoon-scene-background-summer-cloudy-weather-air-design-beautiful-pink-orange-purple-evening-panorama-wallpaper-fluffy-romantic-horizon-graphic-illustration_88472904.htm#fromView=search&page=1&position=2&uuid=ba1a5dd7-fd9b-4c19-83d3-697015324a86

Link to license information: <https://www.freepikcompany.com/legal/#nav-freepik-license>

Start and Finish Lines: “raceLine.obj”, “Start.png”, and “Finish.png”

Source Link: <https://sketchfab.com/3d-models/race-drag-start-and-finish-line-f30a73703bb74d1fa4beacf731d1baf6>

Link to license information: <https://sketchfab.com/terms>

Traffic Cones: “cone.obj” and “cone.png”

Source Link: <https://sketchfab.com/3d-models/traffic-cone-66a16ed89c964ce7a923216cf6400f51#download>

Link to license information: <https://sketchfab.com/terms>

Background Music: “bg.wav”

Source Link: <https://pixabay.com/music/upbeat-movement-200697/>

Link to license information: <https://pixabay.com/service/license-summary/>

Car Engine Sound: “engine.wav”

Source Link: <https://samplefocus.com/samples/sport-car-engine-fx>

Link to license information: <https://samplefocus.com/about>

Car Honk: “honk.wav”

Source Link: <https://samplefocus.com/samples/car-horn>

Link to license information: <https://samplefocus.com/about>

Car Sound: “car.wav” (not utilized)

Source Link: <https://pixabay.com/sound-effects/search/vehicle/>

Link to license information: <https://pixabay.com/service/license-summary/>

Car Hit Sound: “bonk.wav”

Source Link: <https://tuna.voicemod.net/sound/c3c6574e-20e4-4116-ac7d-e54534e50d7d>

Link to license information: <https://www.voicemod.net/copyright-policy/>

RVR-5029 LAB MACHINES TESTED ON

Remote Desktop: ecs-gen-avd-6 (Networking was tested on one machine)