Kathmandu University

Department of Computer Science and Engineering

Dhulikhel, Kavre

Mini-Project Concept Note On:

"Traffic Loop Game"

[Code No: COMP 342]

Submitted by

Chandan Kumar Mahato - 31

Submitted to

Mr. Dhiraj Shrestha

Department of Computer Science and Engineering

Submission Date: 04/24/2023

Contents

1. Introduction.....1

2. Library and Language Used.....1

3. Mathematical Functions and Geometry.....3

4. Conclusion.....4

1. Introduction

Traffic Loop is a racing game that will be built using HTML, CSS, JavaScript and Three.js, which utilizes WebGL technology. The game is designed to give players an exciting experience of driving a vehicle on a race track that is in the shape of the digit 8. Players will control the vehicle on the left side of the track while the computer generates vehicles automatically on the right side. As the game progresses, more and more vehicles will appear on the computer's side. Players must avoid colliding with these vehicles and complete each lap to increase their score. The aim of this project is to provide an understanding of computer graphics, WebGL, related libraries, and other tools and technologies used in game development.

2. Library and Language Used

To develop Traffic Loop, we will be using a combination of tools and technologies, including HTML, CSS, JavaScript, Three.js, WebGL.

HTML and CSS:

HTML (Hypertext Markup Language) is the standard markup language used to create web pages. It provides the structure of a web page, defining elements such as headings, paragraphs, and links. CSS (Cascading Style Sheets) is used to define the visuals appearance of a web page, such as the layout, colors, and fonts.

In Traffic Loop, HTML and CSS will be used to create the user interface and layout of the game. This includes elements such as buttons, text and images, as well as the styling and positioning of these elements on the screen.

JavaScript:

JavaScript is a programming language used to create interactive and dynamic web pages. It is widely used in web development and provides a wide range of features for manipulating web pages, such as event handling animations, and data storage.

In Traffic Loop, JavaScript will be used to create the gameplay mechanics, such as controlling the user vehicle, generating computer-controlled vehicles, and detecting collisions. JavaScript

will also be used to communicate with Three.js and WebGL to create the 3D graphics and animations.

Three.js:

Three.js is a JavaScript library used for creating and displaying 3D graphics in a web browser it provides a range of features for working with 3D models, such as loading and manipulating 3D objects, creating lighting and shadows, and rendering scenes. Three.js uses WebGL under the hood.

In Traffic Loop, Three.js will be used to create the 3D models of the racetrack and vehicles, as well as to render the scenes and apply lighting and shadows. Three.js will also be used to create animation and special effects, such as smoke and fire.

WebGL:

WebGL (Web Graphics Library) is a JavaScript API for rendering 3D graphics in a web browser. It provides a low-level interface for accessing graphics hardware, allowing for high-performance rendering of complex 3D scenes.

In Traffic Loop, WebGL will be used to render the 3D graphics created with Three.js providing a high-performance and visually stunning gaming experience. WebGL will also be used to apply shaders and special effects to the 3D models, such as reflections and textures.

3. Mathematical Functions and Geometry

In developing Traffic Loop, several mathematical functions and geometry will be used to achieve and desired effects. For instance, the sin and cosine functions will be used to create the motion of the vehicles and generate the turning angles. Pythagoras' theorem will be used to calculate the distance between the user's vehicle and the computer-generated vehicles to detect collisions. Additionally, geometry will be used to create the 3D shapes and vehicles and the race track.

4. Conclusion

Traffic Loop is a game that will be developed using HTML, CSS, JavaScript, and Three.js, utilizing WebGL technology. This game will provide players with thrilling racing experience, where they must avoid collisions with computer-generated vehicles and complete each lap to increase their score. The project aims to provide a comprehensive understanding of computer graphics, WebGL, related libraries, and tools and technologies used in game development. Mathematical functions and geometry will also used to achieve the desired effects.