CS4735 - Project Outline - Plane First Person Game

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-Overview

Player is inside a plane, in the first person view. They control their view orientation and forward speed, and can fire their weapon. There is an enemy plane in the game world, who the player must defeat in order to score points. The game will end after a certain amount of points has been obtained, or the game timer expires. If the player or the enemy is defeated with a shot from a weapon, they will be returned to their starting position, and the one who defeated the other will score a point.

-Features

This game will have a single mode, where the player plays alone against dummy enemy planes who will feature basic artificial intelligence. They defeat the enemy planes to reach their score objective, at which point the player either wins or loses.

Game:
-Objects

Player's plane: The player's "character in-game".
        -Invisible to the player (first person perspective)
        -Solid
        -Directly input controlled
        -Actions:
                -Translate(Move forward)
                -Rotate (change view orientation)
                -Fire weapon (on button press)
                -Collide

Enemy plane:
        -Visible, Coloured or Textured, Plane model
        -Solid
        -Computer-controlled
        -Actions:
                Translate(Move forward)
                -Rotate (change view orientation)
                -Fire weapon
                -Collide

Scenery: The ground, background

-Visible, Coloured, Textured, Landscape
-Solid
-No movement, static
-Actions:
    -Collide

-Models

There will only be two three-dimensional object models required for this game:
    -Plane model
    -Ground/Scenery model

These may be composed of various parts, but in general will be treated as whole objects with no animation beyond movement.

-World

The game world will consist of the scenery/ground model, an opaque blue sky, and a sun in the sky to suggest light direction. It is important that the sky does not resemble the ground too much in colour or texture, as this may disorient the player.

The world will be illuminated with atmospheric lighting so all object are bright and clear, and directional light to help identify object orientation.

Due to game scope, the ground model may be reduced to a simple plane textured with a satellite image or stylized ground texture, but if time permits, it will consist of hills generated by a repeating heightmap.

Game size will depend on speed of the planes relative to the ground, but they should be able to fly for a minute or two before reaching the game world boundries.

-Controls

The player will control their plane entirely through keyboard controls with the following control scheme:

W - Increase forward thrust. (there will be a maximum speed)
S - Reduce forward thrust. (there will be a minimum speed)
A - Roll plane left (player perspective view rotates counter-clockwise)
D - Roll plane right (player perspective view rotates clockwise)

Arrow up - Rotate player viewport downwards. (inverted view control)
Arrow down - Rotate player viewport upwards. (inverted view control)

Arrow left - Rotate player viewport left.
Arrow right - Rotate player viewport right.

Space - Fire weapon.
Escape - Exit game.
Enter (on start screen) - Start game.

-Interactions

Start game: Begins the game with the player at their default starting position, at the center of the game world. The enemy plane is placed at a random location in the world. The game timer starts and both player's scores are set to zero.

Fire weapon: When either the player or the enemy plane fires their weapon, there will be a bullet flash animation (likely just a sharp,brief change in lightning) and a line will be traced from the front of the plane in its view direction to compute any bullet collision. A simple bullet animation will follow along this path (a dark, short line segment to resemble a bullet).

Bullet hit: When a plane fires their weapon, and an enemy plane is in the line of sight of the "projectile", the enemy plane will suffer a hit.

Plane hit by bullet: When a plane suffers a hit from a bullet, that plane is destroyed, and a new plane will be created at their original starting position. If this plane happens to be the player's the player will see a message informing them they were hit, and their view perspective will follow their newly created plane at their original starting position. If this plane happens to be a computer-controlled enemy, the player will be informed that the enemy was destroyed and was re-created.

Plane collides with another plane: In the event that two planes should collide, neither is awarded points, but both planes are destroyed and returned to their original positions.

Plane collides with ground: The plane is destroyed, that player receives no points, and the plane is re-created at its starting position.