CS 352
Computer Graphics and Visualization

SIMULATING CAR DRIVING EXPERIENCE

170001012
ASHWINI JHA

170001024
JHALAK GUPTA

Overview:

We have modelled a car structure with keyboard and mouse functionalities to move the car. The viewer is allowed to roam around using keyboard controls and enjoy the view.

Features:

1. 3d geometric transformation
2. 3d viewing
3. keyboard accessibility
4. Camera controls, translational and rotational(3-axis)
5. Texture+color: Textures mapped to grass, ground, mountains, and clouds, with the blue background colour for sky and cars with different colours.
6. Day/Night Modes: Option to toggle between day and night modes
7. 3D Trees along the roads
8. Text: Text overlay detailing controls, etc.
9. Animation: Moving cars.
10. Camera Movement: Camera movement using a keyboard to help drive the car.

Tech Stack:

Primary Tools

- GLUT as OpenGL window framework
- C++
- Image libraries for textures
- BMP files as textures

Instructions:

Controls are:

1. Up key - to move camera forward
2. Down key - to move camera backward
3. Left key - to rotate camera to the left
4. Right key - to rotate camera to the right
5. t - top view
6. a - to move left
7. d - to move right
8. w - to zoom in
9. s - to zoom out
10. n - day/night toggle

11. i - to show or hide instructions
12. m - to enable/disable car movement
13. q - quit

If you wish to move the car, press ’m’

1. Up key - to move car forwards
2. Down key - to move car backwards
3. Left key - to rotate car to the left
4. Right key - to rotate car to the right

Components of the project:

This project has cars, roads, trees, houses and mountains as components built using OpenGL libraries GLUT and functions.

To construct car, we have used OpenGL functions like GL_LINES, GL_POLYGON, GL_QUADS. This can be found in drawcar() function in the car.cpp file.

Similarly, to construct a house and trees, we have used OpenGL functions like GL_LINES, GL_POLYGON, GL_QUADS. This can be found in drawhouse() and drawtree() function in the house.cpp and tree.cpp file respectively.

A display list is constructed for each of these objects. These display lists are used every time a car has to be constructed. So, to create the 6 cars on the road the “carr_display_list “ is called 6 times from within a loop and are translated each time by suitable values to place them correctly. Also, one additional car is constructed which can be moved around. Similarly, for house(house_display_list) and trees(tree_display_list). This can be found in renderScene() function in the main.cpp file.

For the movement of camera GluLookAt() function is used.

Keyboard keys are used in inputKey() and moveCar() functions in the main.cpp file.

Textures such as grass, sky, etc. are stored in texture folder and are loaded in texture.cpp.

Video and other links:

- You can see the video here!
- You can also find the code here

Screenshots:

INITIAL VIEW

DAY MODE

NIGHT MODE

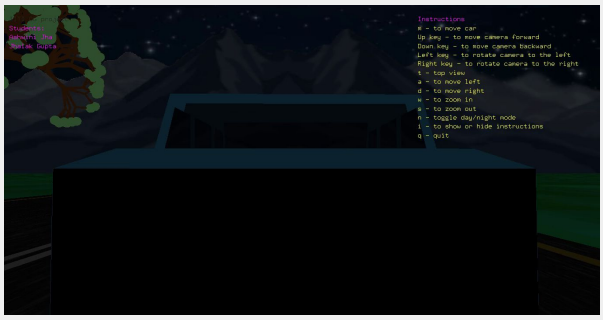
DIFFERENT VIEWS

DAY MODE	NIGHT MODE
	
	
	
	


IIIT CG project
Students:
Ashwini Jha
Jhalak Gupta
If you wish to move the car,
Up key - to move car forwards
Down key - to move car backwards
Left key - to rotate car to the left
Right key - to rotate car to the right
m - to stop car movement
n - toggle day/night mode
i - to show or hide instructions


Students:
Ashwini Jha
Jhalak Gupta
Instructions
m - to move car
Up key - to move camera forward
Down key - to move camera backward
Left key - to rotate camera to the left
Right key - to rotate camera to the right
t - top view
a - to move left
d - to move right
w - to zoom in
s - to zoom out
n - toggle day/night mode
i - to show or hide instructions
q - quit

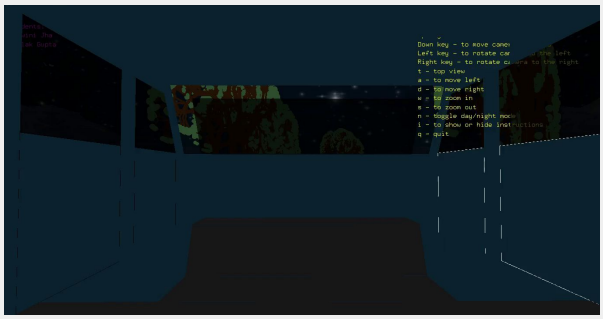

IIIT CG project
Students:
Ashwini Jha
Jhalak Gupta
If you wish to move the car,
Up key - to move car forwards
Down key - to move car backwards
Left key - to rotate car to the left
Right key - to rotate car to the right
m - to stop car movement
n - toggle day/night mode
i - to show or hide instructions


Students:
Ashwini Jha
Jhalak Gupta
Instructions
m - to move car
Up key - to move camera forward
Down key - to move camera backward
Left key - to rotate camera to the left
Right key - to rotate camera to the right
t - top view
a - to move left
d - to move right
w - to zoom in
s - to zoom out
n - toggle day/night mode
i - to show or hide instructions
q - quit


IIIT CG project
Students:
Ashwini Jha
Jhalak Gupta
Instructions
m - to move car
Up key - to move camera forward
Down key - to move camera backward
Left key - to rotate camera to the left
Right key - to rotate camera to the right
t - top view
a - to move left
d - to move right
w - to zoom in
s - to zoom out
n - toggle day/night mode
i - to show or hide instructions
q - quit


Students:
Ashwini Jha
Jhalak Gupta
If you wish to move the car,
Up key - to move car forwards
Down key - to move car backwards
Left key - to rotate car to the left
Right key - to rotate car to the right
m - to stop car movement
n - toggle day/night mode
i - to show or hide instructions


IIIT CG project
Students:
Ashwini Jha
Jhalak Gupta
Instructions
m - to move car
Up key - to move camera forward
Down key - to move camera backward
Left key - to rotate camera to the left
Right key - to rotate camera to the right
t - top view
a - to move left
d - to move right
w - to zoom in
s - to zoom out
n - toggle day/night mode
i - to show or hide instructions
q - quit


Down key - to move camera
Left key - to rotate car
Right key - to rotate camera to the right
t - top view
a - to move left
d - to move right
w - to zoom in
s - to zoom out
n - toggle day/night mode
i - to show or hide instructions
q - quit