

ZENSE PROJECT

Project-251

By: Likhith Kumar IMT2020028

Instructions to Test Game:

<https://github.com/Likhith27/Area-251/blob/main/Project-251.zip> Go to this link and extract the zip file locally in your pc. Inside the project-251 folder run the Aircraft Physics application that is an exe file.

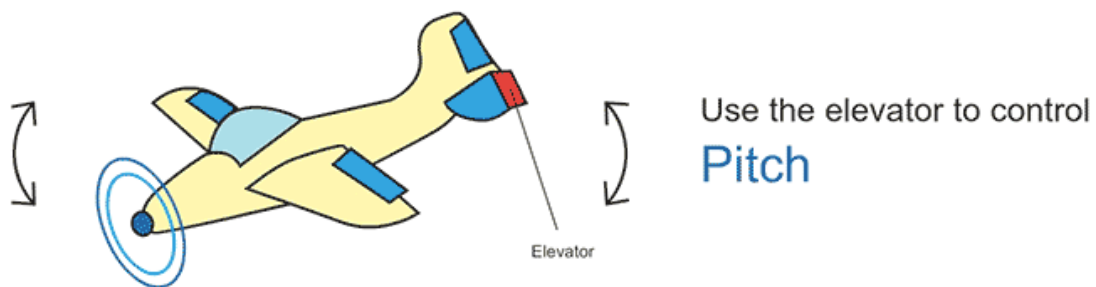
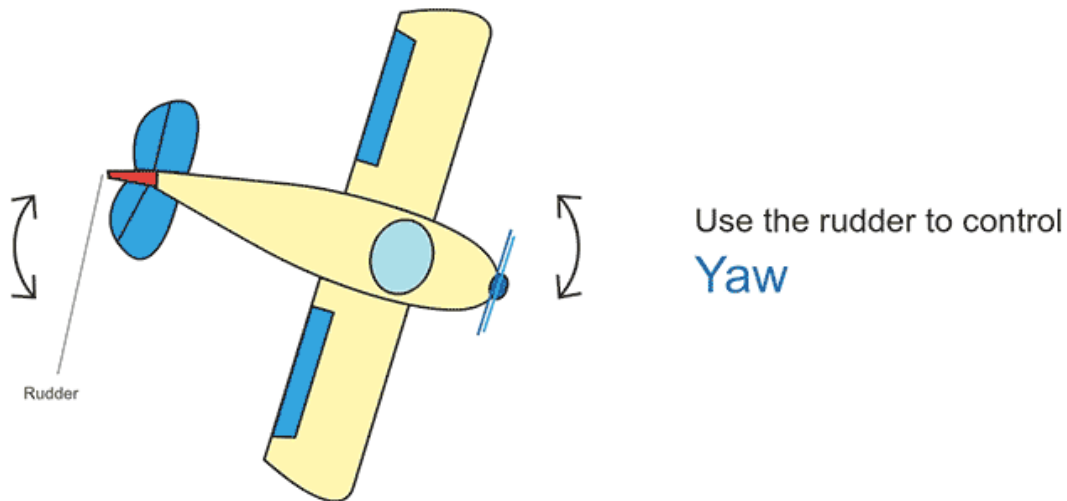
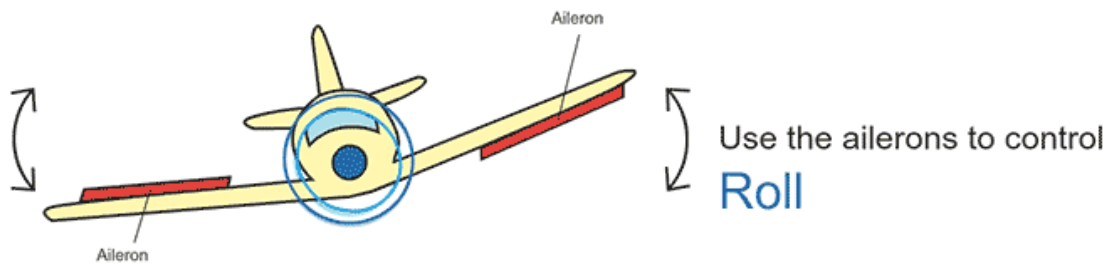
Game Controls:

- F key is used to increase the thrust of the plane.
- A and D keys are used to control the left and right movement of the plane.
- S and W keys are used to control the upward and downward movement of the plane.
- SPACE key is used to apply the brakes.
- LEFT SHIFT key is used to decrease flap sensitivity and thrust sensitivity while in flight.
- ESC key is used to go back to main menu.
- Main Menu consists of three options PLAY, OPTIONS, QUIT.
- If you want to quit the game use ESC key and click on QUIT button.

Project Description:

I started this project in my summer break, the main motivator for this project is sebastian laque(<https://www.youtube.com/c/SebastianLaque>). I developed so much interest watching his **Intro to game development** , then I started exploring Unity engine and got some packages from Unity asset manager, created a player made him roam in a forest(Imported from asset manager).

Now Coming to project-251 🤔, surely this project was a roller coaster ride for me. I nearly spent 8 days on this project, the hard part was handling the errors and fixing them. The second major hurdle was the physics, I had to go through many resources for the exact working of plane, like the roll,pitch,flap and yaw movements of the plane wasn't coming exactly as expected.



This project consists of terrains that aren't rigid bodies, there is no collision between the plane and terrains, there is a runway on which the plane rests. You can play the game until you get bored there are no missions, no time constraints just a feel good free roam (Happy roaming 😊). The runway has very less coefficient of restitution, so landing the plane may be challenging. While starting the plane, you should have a threshold acceleration to take the plane off from the runway (Mass of airplane is 1000 kg). There is a clear indication when you start accelerating (i.e pressing **F** key) the plane, the propeller starts rotating and once

you reach enough speed press **S** key to explore the world. There is lot more I would love to do with this project.

Learning from this project:

Starting from the unity engine editor, I have learnt to set up the Scripts, Prefabs, materials and give them proper naming. Customising the editor was also a learning, which made many things easier, then I started learning basic C# used in unity

(Vector2, Vector3, Start(), Update(), FixedUpdate(), Bivector3(), clamp01(), Lerp() and many methods). Coloring the 3D models was also a tough task, which I didn't used in this project.

Being patient when errors throws up is one of the major learning in this project. Scaling up terrains and properly importing packages from unity asset manager. Another major learning was the physics in the Aero dynamics, I didn't totally get the grasp of some equations in AeroSurface.cs and AeroSurfaceConfig.cs, but got some intuition.

Resources:

1. For Physics behind the plane: <https://github.com/gasgiant/Aircraft-Physics>.
2. For assets : <https://assetstore.unity.com/account/assets>
3. For hands on : <https://www.youtube.com/c/SebastianLague>

You can download this game from github releases(link given below)

<https://github.com/Likhith27/Area-251/releases/tag/Project-251>.