



FLIGHT SIMULATOR GAME USING UNITY 3D

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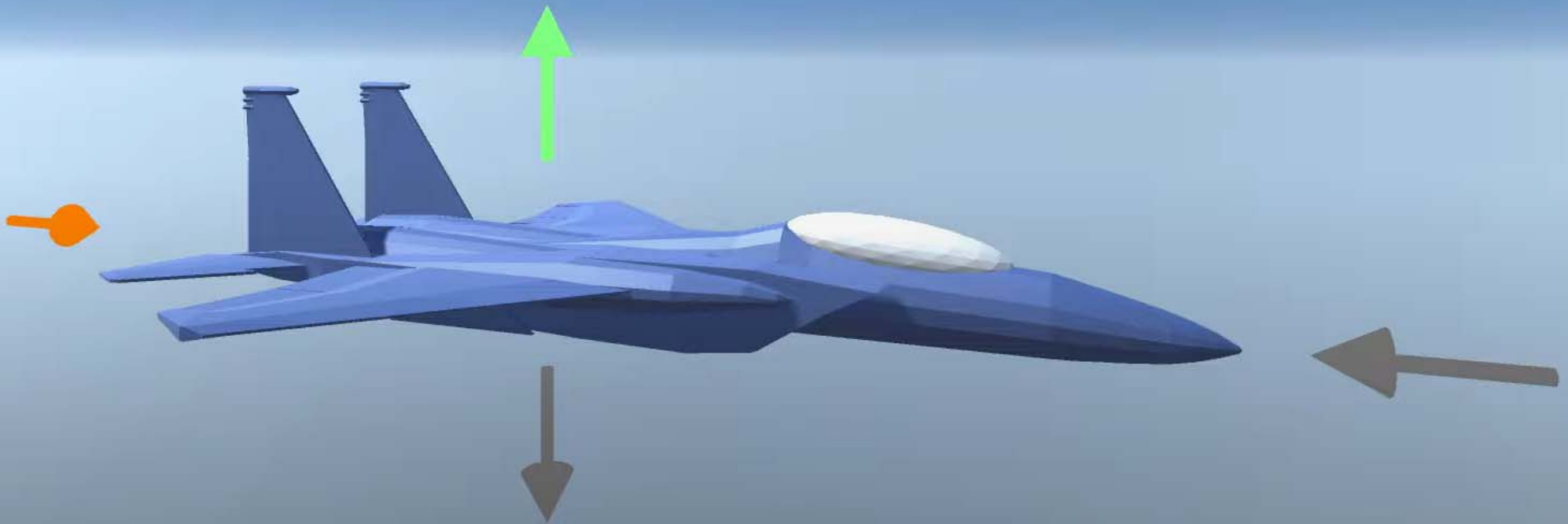
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ABSTRACT:

- ❑ The development of a flight simulator game using the Unity 3D game engine. The game is designed to provide users with a realistic flight experience by incorporating realistic physics and environmental effects.
- ❑ We discuss the creation of a flight simulator that enables user interaction in a simulated environment using virtual reality technology. This setting mimics what a pilot would see in an aircraft cockpit.
- ❑ Flight simulators are an important tool for aviation safety and training. They provide a safe and realistic way for pilots to train and for aircraft designers to test new designs.
- ❑ Finally, flight simulators are used by researchers to study human factors issues related to flying. This includes studying how pilots make decisions under pressure and how they handle emergencies.

INTRODUCTION:

- ❑ The primary objective of this project is to develop a virtual reality (VR) environment for familiarity of flight experience.
- ❑ The goal is to provide pilots under training with an immersive and realistic experience of flight take-off and landing.
- ❑ The VR environment is designed using Unity 3D game engine, allowing for an interactive and engaging experience.
- ❑ The designed environment for this project replicates an actual cockpit, including different areas such as runway, security checkpoints etc., The VR environment is designed using Unity 3D game engine, allowing for an interactive and engaging experience.

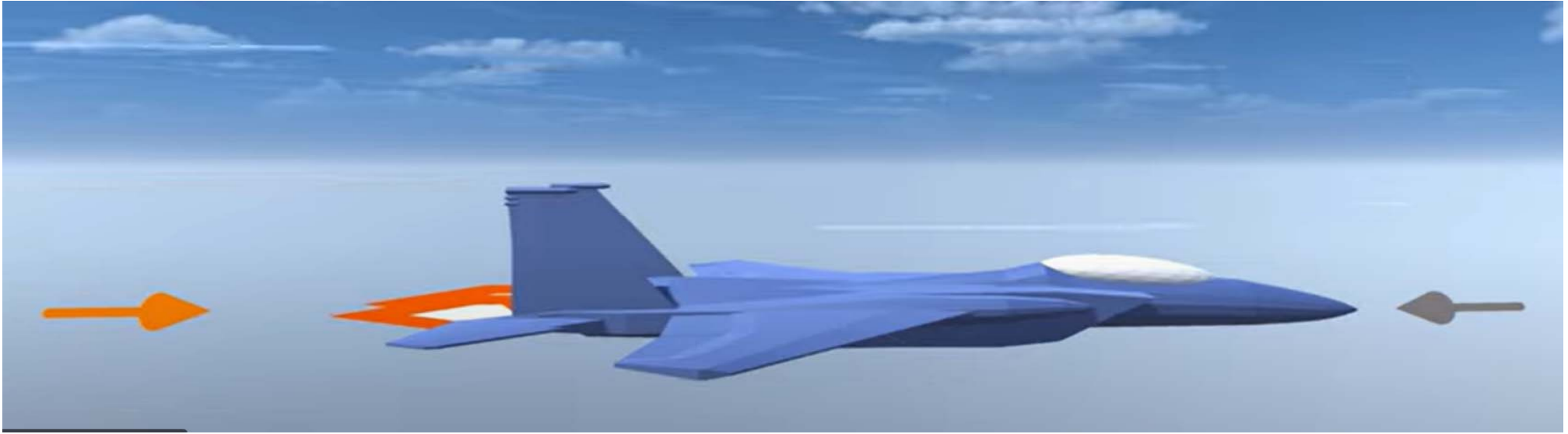


Plane flying through the air follows the Newton's laws of motion.

The plane remains in a steady state if all of the forces are balanced.

The plane speeds up or turn when there is an imbalance in the forces.

FORCES AFFECTING THE FLIGHT:



Drag and Thrust

- When air hits the plane it creates drag and causes the plane to slow down.
- The engine creates the thrust to speed up the plane.
- When **Drag=Thrust** the plane flies at a constant speed.

GRAVITY AND LIFT

- Gravity constantly pulls the plane downwards and the air flowing above the wing generates lift which pulls the plane upwards.
- In flight simulation, the airflow over the wings is modeled using complex mathematical equations that take into account factors such as the angle of attack, airspeed, and wing shape.
- This force is included in the simulation to ensure that the aircraft behaves realistically when it is on the ground and when it is in the air.



OBJECTIVE

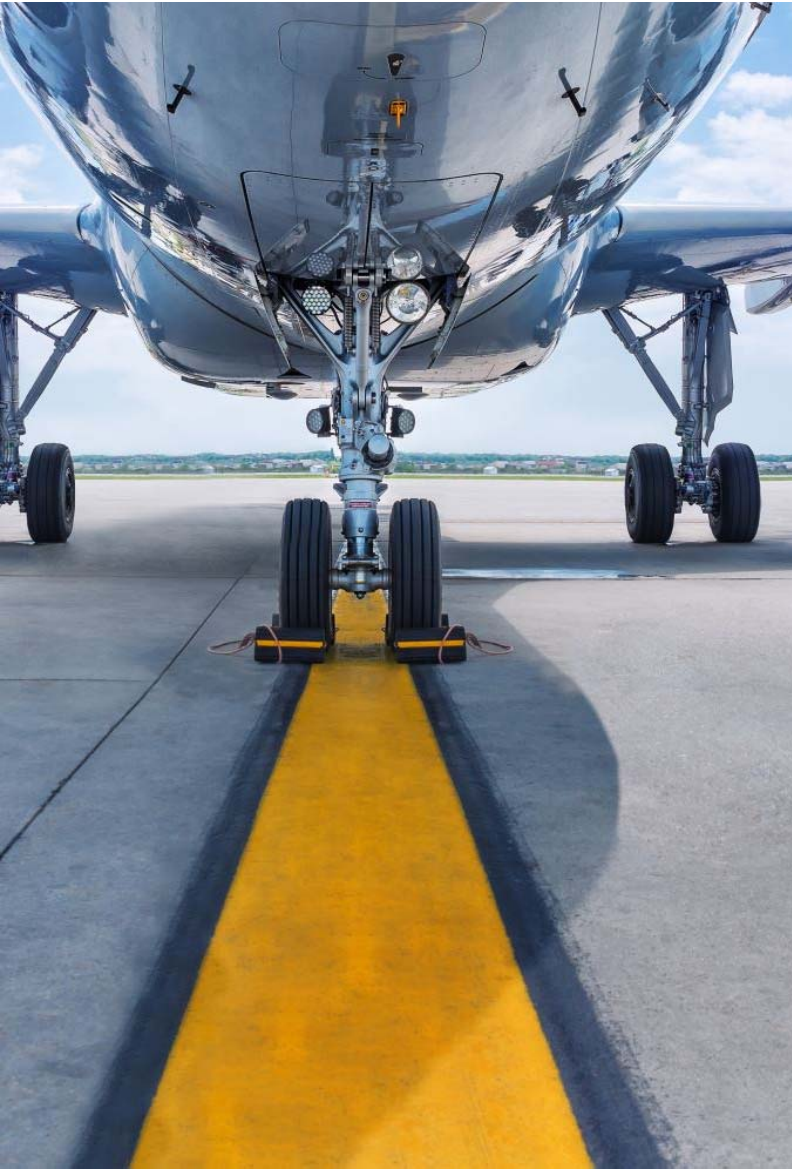
Flight simulators are an important tool for aviation safety and training. They provide a safe and realistic way for pilots to train and to improve their skills. As technology continues to improve, flight simulators will become even more realistic and immersive. This will allow pilots to train more effectively and safely, which will ultimately lead to safer skies. Provide a safe and realistic environment for pilots to train in.

- Allow pilots to practice flying in a variety of conditions, including different weather, terrain, and traffic situations.
- Help pilots to learn new procedures and techniques.
- Help pilots to develop their skills and judgment.
- Reduce the risk of accidents and injuries.
- Improve aviation safety.

FEATURES

- ❑ Realistic aircraft models: Accurate 3D models of different types of aircraft, including commercial airliners, military jets, helicopters, and more, with realistic textures, animations, and lighting.
- ❑ Cockpit view: An interactive cockpit view that gives players a first-person perspective of the aircraft's interior, including realistic instrument panels and controls.
- ❑ Flight controls: Accurate flight controls that allow players to control the aircraft's movement and behavior, including throttle, pitch, yaw, and roll.
- ❑ Sound effects: Realistic sound effects for aircraft engines, wind, and other ambient sounds that contribute to the immersive experience of flying.





ANIMATION

- Simulate various weather conditions, such as clouds, precipitation, and lightning.
- Detailed animations of the aircraft's external features, such as flaps, landing gear, and winglets.
- Flight taking off and landing on runway.

SOUND

- The sound design in a flight simulator game should be designed to create a realistic and immersive experience for the player.
- Engine sounds: The sound should vary depending on the type of engine, the throttle position, and the altitude.
- Wind sounds: The wind sound should vary depending on the altitude, airspeed, and weather conditions.

IMPLEMENTATION

The implementation of flight simulation VR environment in airports using 3D Unity involves various functionalities, each designed to simulate realistic scenarios and improve personnel's preparedness and response times. This section describes each functionality with text and images.

- ❖ **Creating a 3D model of the aircraft:** You can use a variety of 3D modeling tools to create a 3D model of the aircraft. Some popular 3D modeling tools include Blender, Maya, and 3ds Max.
- ❖ **Implementing the flight physics:** The flight physics is the code that calculates how the aircraft will move in response to the pilot's inputs. There are a variety of flight physics libraries available for Unity. Some popular flight physics libraries include Real Flight and Flight Gear.
- ❖ **Implementing the user interface:** The user interface is the way that the pilot interacts with the flight simulator. The user interface should include controls for the aircraft's movement, as well as a display that shows the aircraft's position, speed, and altitude.

APPLICATIONS

- Pilot Training – For creating realistic flight simulator games for pilot training purposes. These games can help pilots learn and practice flying skills in a safe and controlled environment.
- Education - Flight simulator games can be used in educational settings to teach students about aviation and flight mechanics.
- Military - In military training to simulate different flight scenarios and help train pilots and aircrews to validate the training. These games can be used to demonstrate how aircraft are controlled and how they respond to different situations.
- Research and Development - To create flight simulators for research and development purposes. These simulators can be used to test and evaluate new aircraft designs or to explore new flight technologies.

CONCLUSION

- In conclusion, flight simulation games using Unity 3D offer a highly engaging and immersive experience for players.
- With the ability to simulate realistic flight physics, dynamic weather conditions, and detailed cockpit controls, these games can provide a near-realistic experience of flying an aircraft.
- Unity's powerful engine also allows for the creation of stunning visual effects and highly detailed environments, further enhancing the player's experience.
- From flight training and education to recreational entertainment, flight simulation games using Unity 3D offers developers more plugins & assets ,also to add new features and functionality.

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THANK YOU
