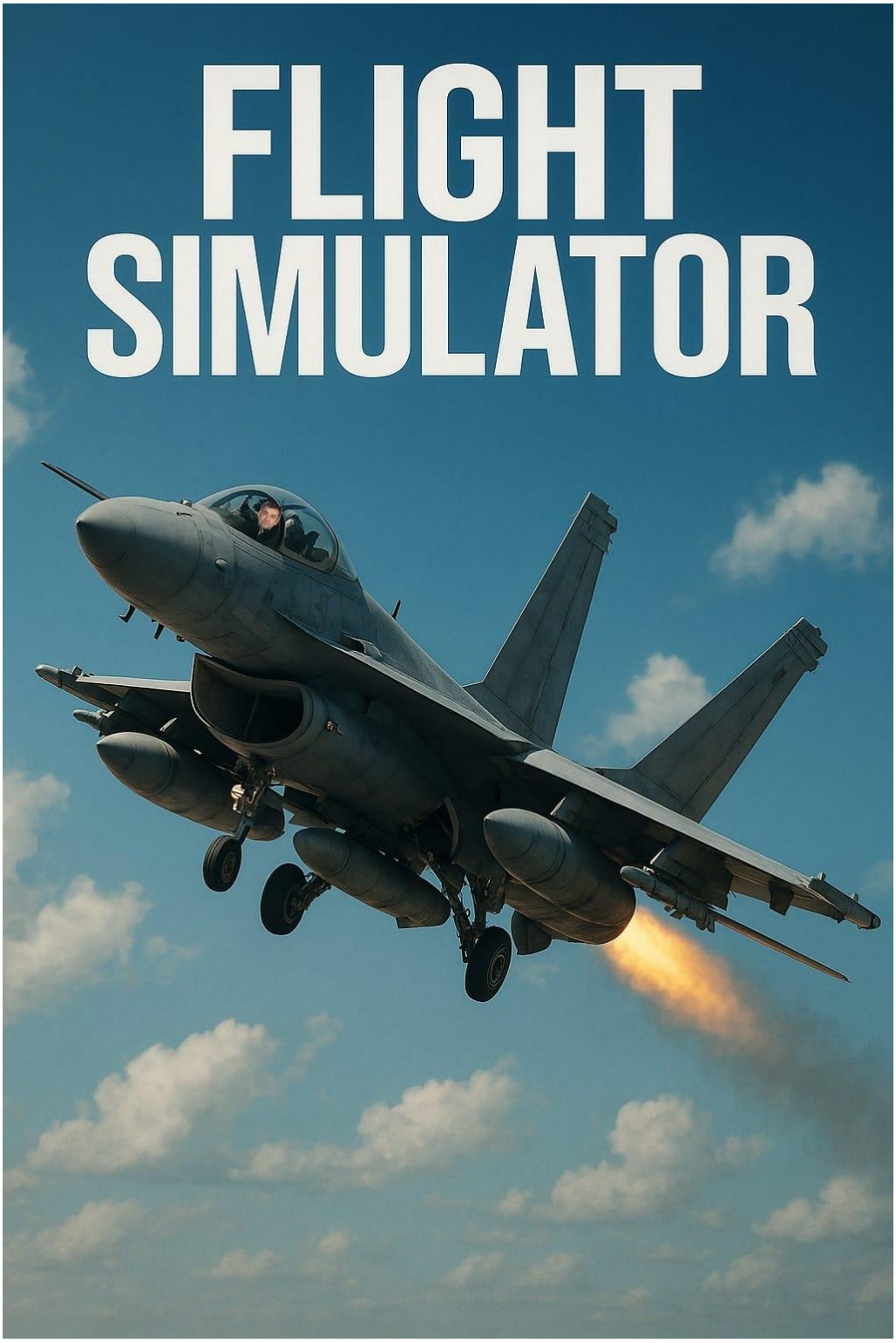
FLIGHT
SIMULATOR

USER MANUAL

1. System Requirements

Minimum:

- OS: Windows 10 64-bit
- Processor: Intel i5 / AMD Ryzen 5
- RAM: 8 GB
- GPU: GTX 1050 Ti or equivalent
- Disk Space: 2 GB

Recommended:

- OS: Windows 11
- Processor: Intel i7 / Ryzen 7
- RAM: 16 GB
- GPU: RTX 2060 or higher
- Disk Space: 5 GB

2. Installation Guide

1. Download the project files.
2. Unzip and open .uproject file using **Unreal Engine 5.2**.
3. Compile the project if prompted.
4. Connect ESP32 via USB if using physical controller.
5. To use VR: Install and run **iVRy** app on both PC and smartphone.
6. Run the simulation in **Standalone Game** mode for full features.

3. Hardware Setup

ESP32 Joystick & Throttle:

- Connect via USB.
- Upload firmware using Arduino IDE.

- Confirm analog input works via Serial Monitor.

VR Headset (Optional):

- Install **iVRy** on PC. (From Steam Desktop Application)
- Install SteamVR.
- Install **iVRy App** on mobile.
- Connect both via Wi-Fi or USB.
- Enable VR Preview in Unreal.

4. Gameplay Instructions

Single Player Mode (AI Dogfight):

- Control aircraft using joystick or keyboard.
- Avoid AI fire and try to shoot down enemy planes.
- Use VR to freely look around the cockpit and track enemies.

Multiplayer Mode:

To Host:

1. Open project and start a **Listen Server** by running the game with ?listen parameter.
2. Share your IP address with friends.

To Join:

1. Launch the game and open the console (press ~).
2. Type open <host-ip-address> and press enter.

⚠ Both players must be on the same network or have port forwarding enabled.

Main Menu Buttons – Explanation

- **VR**
  Launches the simulation in Virtual Reality mode.
  ⚠ Requires a smartphone with iVRy app and the iVRy desktop driver running.
- **SINGLE PLAYER**
  Starts a dogfight scenario against AI-controlled aircraft.
  Recommended for testing control responsiveness and combat mechanics.
- **SOLO FLIGHT**
  Starts a free-flight mode with no enemies.
  Ideal for training and testing joystick/throttle sensitivity.
- **MULTIPLAYER**
  Enters the multiplayer menu where users can host or join local network sessions.
  Use console command open <host-ip> to join if needed.
- **CONTROL**
  Toggles external hardware inputs such as joystick and throttle.
  If disabled, keyboard and mouse inputs are used instead.
- **QUIT**
  Exits the simulation and closes the application.

5. Controls

Action	Joystick	Keyboard/Mouse
Pitch / Yaw	Analog Stick	Mouse movement (up/down)
Roll	Analog Stick	Mouse movement (left/right)
Fire	ESP32 Button	Mouse Left Click
Throttle	Analog Throttle	W(Acceleration),S(Deacceleration)
Turn	-	A(left), D(right)

6. Troubleshooting

Issue	Solution
No VR display	Ensure iVRy is installed and connected correctly.
ESP32 not detected	Recheck COM port and reupload firmware.
Multiplayer lag	Test over LAN, and reduce effects if needed.
No firing from AI	Check projectile blueprint and collision logic.