Tennis Simulation Game - User Manual

Download Project

Google Drive Link: https://drive.google.com/drive/folders/1qSobBWWpept_F53lAkhFL--c8XmeQqNT?usp=sharing

Download **CompiledTennisSimulation.zip** file and extract it to a folder.

Quick Start Guide

Step 1: Open Unreal Editor

- Launch **Unreal Engine 5** on your computer

Step 2: Load Project

- Click **Browse** button

- Navigate to extracted folder and select **MyProject.uproject** file

- Click **Open**

- Wait for project to load (1-2 minutes)

Step 3: Verify Map Selection

- Ensure **TennisSimulation2** map is selected

- Check the map name in the toolbar at the top

- If different map is selected, click **File** > **Open Level** > **TennisSimulation2**

Step 4: Start Game

- Click green **Play** button at the top of the screen

- Game will start automatically in split screen mode

About the Game

What Happens?

- Tennis simulation starts automatically in **split screen mode**

- **Left racket (red)** and **Right racket (blue)** are controlled by sensor data

- Real sensor data is sent to rackets via UDP connection

- Rackets move according to physical sensor movements

- Ball physics respond to racket movements and collisions

- Two camera views show different perspectives of the court

Sensor System

- Physical sensors are attached to real tennis rackets

- Sensor data includes position, rotation, acceleration, and gyroscope values

- Data is transmitted via UDP protocol to the game

- Each racket receives individual sensor data streams

- Game responds in real-time to sensor movements

Split Screen Mode

The game automatically starts in split screen mode with two camera perspectives.

Default Configuration

- Game launches with split screen already active

- Left screen shows left player perspective

- Right screen shows right player perspective

- No additional setup required

If Single Screen Appears

If the game starts in single screen mode:

1. Click small **arrow** next to **Play** button

2. Set **Number of Players** to **2**

3. Select **Net Mode**: **Play Standalone**

4. Click **Play** button

5. Screen will split into two views

Console Commands (Optional)

Press **tilde (~)** key during gameplay and type:

disableallscreenmessages → Removes on-screen debug messages

stat fps   → Shows FPS counter

quit   → Exit game

Technical Requirements

Hardware

- Unreal Engine 5 compatible computer

- Physical tennis rackets with attached sensors

- UDP network connection for sensor data

- Xbox Controller (recommended for split screen)

Software

- Unreal Engine 5.0 or higher

- Windows 10/11 operating system

- Network configuration for UDP sensor data reception

Troubleshooting

Wrong Map Loaded?

- Check if **TennisSimulation2** is displayed in the toolbar

- If different map is loaded: **File** > **Open Level** > **TennisSimulation2**

- Save the project to keep TennisSimulation2 as default

Game Not Starting?

- Ensure Unreal Engine 5 is properly installed

- Try running as administrator

- Check project file integrity

Single Screen Instead of Split Screen?

- Use Play button dropdown settings

- Set Number of Players to 2

- Select Play Standalone mode

Performance Issues?

- Close unnecessary programs

- Lower graphics settings in Editor Preferences

- Reduce screen resolution

Sensor Data Not Working?

- Check UDP network connection

- Verify sensor hardware is functioning

- Confirm correct IP address and port configuration

Technical Details

Sensor Data Format

- Position data (X, Y, Z coordinates)

- Rotation data (Pitch, Yaw, Roll)

- Linear velocity from accelerometer

- Angular velocity from gyroscope

- Swing power calculation

- Real-time data streaming via UDP

Game Features

- Real-time sensor integration

- Physics-based ball movement

- Collision detection between rackets and ball

- Multi-camera system

- Split screen multiplayer support

- Unreal Engine 5 graphics and physics

For Instructors

Classroom Demonstration

1. Open Unreal Editor

2. Load MyProject.uproject

3. Verify **TennisSimulation2** map is selected

4. Click green Play button

5. Game starts automatically in split screen mode

6. Demonstrate sensor-controlled gameplay

Learning Objectives

- Real-time sensor integration in game engines

- UDP network communication protocols

- Physics simulation in gaming

- C++ and Blueprint integration in Unreal Engine

- Hardware-software interface development

Quick Reference

To Start Game:

1. Open project in Unreal Editor

2. Ensure TennisSimulation2 map is loaded

3. Click green Play button

4. Game starts in split screen with sensor-controlled rackets

If Wrong Map Loaded:

1. File > Open Level > TennisSimulation2

2. Click Play button

The game automatically runs in split screen mode and responds to real sensor movements attached to physical tennis rackets.