

# Project Proposal: 3D Racing Circuit Game

## 1. Game Introduction

The 3D Racing Circuit Game is a visually immersive car racing simulation built using Python and OpenGL. The project provides players with an exciting racing experience featuring realistic cars, tracks, and environmental effects. With support for both first-person and third-person camera modes, players can feel the thrill of high-speed racing while navigating a dynamic racing circuit filled with challenges and interactive features.

## 2. Game Features

- Immersive 3D racing circuit with circular asphalt tracks, checkpoints, and finish line.
- Sports car model designed with details like spoilers, headlights, tail lights, and aerodynamic body.
- Two camera modes: First-person (driver's seat) and Third-person (behind-the-car view).
- Car physics system including acceleration, braking, friction, turning, and collision handling.
- Checkpoint and lap system with real-time lap times, best lap tracking, and race finish screen.
- Off-track penalty system that reduces car speed when outside the racing area.
- Collision detection with realistic bounce effects against trees and buildings.
- Speed boost pickups scattered across the track with temporary performance enhancement.
- Dynamic environment with trees, buildings, birds, clouds, sun movement, and spectators.
- Visual effects including speed lines, boost effects, and environment gradients.
- Game states: Start screen, Racing mode, and Race Finished screen with rating system.
- Keyboard and mouse input handling with continuous movement support for smooth gameplay.