

# AI Racing Game Project Report

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## Affirmation of Independent Effort

I affirm that all work presented in this report is the result of our group's own efforts, except where explicitly stated otherwise.

## 1. Background

This game is centered around the theme of environmental protection, aiming to raise player awareness through engaging racing experiences. It incorporates various eco-friendly elements, such as the distinction between electric and fuel-powered vehicles and an energy consumption system, encouraging players to adopt more sustainable driving behaviors. By blending education with entertainment, the game promotes environmental consciousness in a playful and immersive way.

## 2. Main Idea and Core Mechanism

This project aims to develop a racing game based on AI control and player interaction, highlighting the racing experience and collection elements. Players control a vehicle to navigate selectable tracks, complete challenges and daily tasks, defeat AI opponents, and collect gold coins to upgrade levels and vehicles.

The game emphasizes speed, reaction, strategic choices, and stage-based growth, integrating traditional arcade racing with modern psychological mechanisms to enhance immersion.

### Core Gameplay Mechanics

- **Racing Competition:** Players race alongside AI opponents, aiming to finish within the time limit and outperform them.
- **Acceleration Zone:** Tracks feature speed boosters and obstacles requiring quick decision-making.
- **Button Settings:** Players control via on-screen buttons, making it mobile-friendly.
- **AI Learning:** Opponents dynamically adjust their behavior based on the player's performance.

## 3. Future Work

- A player shop system allows players to use coins for vehicle upgrades, creating a goal-gradient effect.
- Unlocking progressively difficult tracks enhances engagement through the skill-challenge balance.
- Real-world weather is mirrored in-game to boost immersion and realism.

## 4. Psychological Principles

### Immersion

Realistic engine sounds, drifting and crashing feedback, and dynamic weather combine to create an immersive environment. A minimalist UI promotes focus and flow.

## Risk vs. Reward

Players must weigh risks and benefits:

- Collecting more coins unlocks upgrades, but mistakes (like crashes) cost time.
- Using acceleration boosts is advantageous but timing is key.
- Deciding whether to overtake AI involves collision risks.

## Feedback and Rewards

- Coin collection is rewarded with audio-visual feedback.
- Leaderboards and post-race summaries provide long-term motivation.
- Hidden routes and variable difficulty levels encourage exploration and replay.

## Challenge and Mastery

Multiple difficulty modes and AI levels let players progress from novice to pro. Badges and car unlocks reinforce a mastery loop and sustained interest.

## 5. Task Breakdown

- **Wufeiyang Chen:** Designed Figma prototype, implemented vehicle mechanics in Unity, managed GitHub version control, and wrote documentation.
- **Shiya Bao:** Developed button functionality and contributed to documentation.
- **Siyuan Huang:** Developed gameplay logic and item interaction in Unity.
- **Zihan Liu:** Created final presentation and proposed future work ideas.

## 6. Appendix

### Game Modes and Screenshots

- **The Mode:** Overview of available gameplay modes.



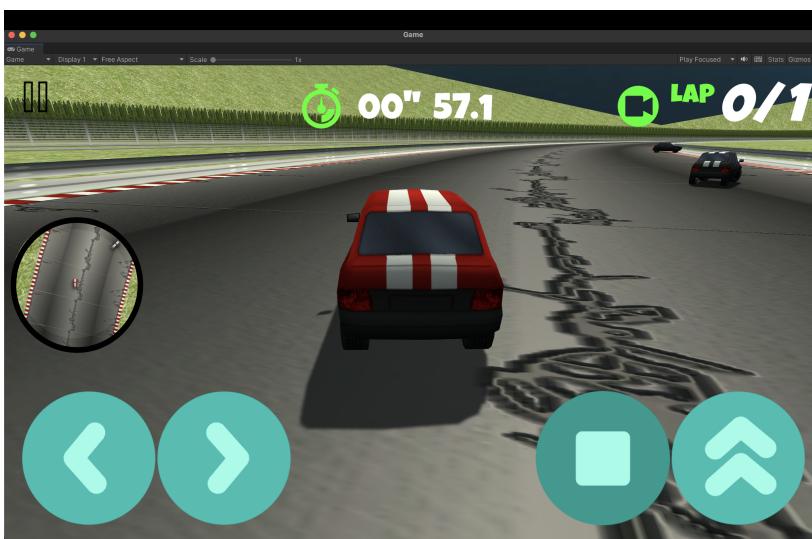
- **The Starting Point:** Initial race position.



- **Acceleration Zone:** Sections that temporarily increase vehicle speed.



- **AI Opponents:** Dynamic obstacles and racing rivals.



- **Ending Page:** Final results and rewards.

