



Game Design Document: Drift: Immersive

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Engine: Unity (2022.3.62f3)

1. Game Concept

Core Idea

Drift: Immersive is a 3D arcade racing game focused on the skill of drifting. The game is built to be played in two distinct modes: a standard 3rd-person "Normal" mode and a 1st-person, "comfort-first" VR mode. My core objective for the player is to master their car's physics to drift through tight turns, maintain speed, and achieve the best possible lap time.

Target Audience

- **VR Enthusiasts:** Players who own PC VR headsets and are looking for a comfortable, headache-free, and engaging driving experience that uses a standard gamepad.
- **Arcade Racing Fans:** Players who enjoy racing games that are easy to learn but hard to master, focusing on skills like drifting rather than realistic simulation.

- **Casual Gamers:** The simple controls and short, replayable tracks make it accessible for players who want a quick "pick up and play" session. Timer can add replayability.

Unique Features

The primary unique feature is the Immersive VR Mode, which is designed from the ground up to be comfortable.

- **Dual-Mode Gameplay:** Players can switch between a standard 3rd-person camera and a fully immersive, in-car VR camera.
- **Gamepad-Driven VR:** The VR mode is designed to be played with a standard gamepad (e.g., PS5 or Xbox controller). This provides precise, familiar controls while the VR headset is used *only* for head-tracking, allowing the player to naturally look around the cockpit.
- **Immersive Startup Sequence:** Before a race begins, the player must perform a short startup sequence from the cockpit, such as adjusting their mirror, turning on the radio, and shifting into gear. (Won't work on the non vr third person version)
- **Comfort-First Physics:** The game physics are tuned for comfort. The car feels "heavy" and will not be "sent flying" on a crash. All disorienting crash visuals are replaced by a safe "fade to black" system.
- **Collectible-Based Driving:** Tracks are not strictly linear; they feature "collectible diamonds" placed along optimal drift lines to encourage control and tracking.

2. Game Mechanics

Game Rules

1. Players start each level in a stationary car. They must complete a brief "startup sequence" before the race timer begins.
2. Once driving, the main goal is to complete 2 laps as fast as possible.
3. A secondary goal is to collect "collectible diamonds" placed on the track to achieve a 100% completion score.
4. Drifting successfully builds a "boost" meter.
5. Crashing will stop the car and reset it, but will *not* send it flying, prioritizing comfort.

Player Actions

- **Drive:** Accelerate, brake, and steer the car using a gamepad.
- **Drift:** Initiate a drift (using a handbrake button on the controller) to slide around corners.
- **Boost:** Use the boost meter (filled by drifting) for a short burst of speed. (stretch goal)
- **Look (VR Mode):** Use the VR headset to naturally look around the cockpit and into turns.

- **Cockpit Interaction (Startup):** At the start of a level, use gamepad buttons to perform the startup check (e.g., D-pad to "adjust mirror," a face button to "start radio," a bumper to "shift into gear").

Unique Gameplay Mechanics

- **VR Immersion (Look and Drive):** The core VR mechanic is using a gamepad for precise control while the VR headset provides 1:1 head tracking. This combination offers the immersion of VR without the complexity of motion controls.
- **Comfort-First Crash System:** Player comfort is the highest priority. If the player has a high-speed crash, the system will **instantly fade to black** for a half-second, reset the car on the track, and fade back in. This completely prevents the player from experiencing the disorienting, headache-inducing visuals of a crash.
- **"Heavy" Physics:** The car's physics will be tuned to feel "heavy." If the player crashes, the car will come to a realistic, solid stop, not "get sent flying." This maintains believability and prevents visual disorientation.

3. Narrative

Story Overview

Drift: Immersive is an arcade-style racer. As such, it does not have a complex, character-driven plot. The game's progression is focused entirely on player skill and mastery. TLDR: It's chill.

Characters

The only "character" is the player, represented as a silent driver. In Normal mode, they are represented by their car. In VR mode, they are an unseen presence in the driver's seat. The focus is on self-immersion rather than playing as a pre-defined character.

Setting

The game is set in a night city, main menu will have a neon-lit world. The tracks are clean, well-lit, and designed purely for racing. The world exists as a "playground" for driving, with no other people or deep lore.

Story Integration with Gameplay

The "narrative" is the player's personal journey of improvement. The "story" is told through a

series of increasingly difficult tracks.

- **Conflict:** The track itself, the "collectible diamonds," and the player's own best time.
- **Resolution:** Achieving a "perfect run"—a fast lap time while collecting all diamonds and executing stylish drifts.

The startup sequence (adjusting mirrors, turning on music) provides a small, personal "narrative" moment at the start of each race, grounding the player in the car and the moment.

4. Environment & Levels

Game Universe

The game universe is a bright, clean, night city world. The visual style is intentionally simple to ensure high performance, especially in VR. Tracks are set at night, using bright neon (stretch goal), emissive lights, and clear track edges to guide the player. The environment is designed to be readable, not distracting, to help maintain comfort.

Level Structure

All levels are "short loops" designed specifically to encourage and test drifting and cornering skills. They are not strictly linear; each track will feature multiple "lines" or paths to discover, highlighted by the placement of collectible diamonds.

- **Objectives (per track):**
 1. **Primary:** Achieve the best lap time (Bronze, Silver, or Gold). (stretch goal)
 2. **Secondary:** Collect all "collectible diamonds."
- **Progression:** Unlocking the next track requires earning at least a "Bronze" time *or* collecting 80% of the diamonds. This gives players two different ways to progress (speed or exploration).

Enhancing Player Experience

- **Clear Edges:** Track edges are always clearly lit or colored to be visible, especially in VR.
- **Collectible Pathing:** The collectible diamonds are placed to naturally guide the player toward the best-feeling drift lines, rewarding skilled driving and track mastery.
- **Immersion:** The 1:1 scale of the environment and the detailed cockpit create a powerful

sense of "being there." The "startup sequence" at the beginning of each race reinforces this.

4. Environment & Levels

Level 1: "Neon Loop" (stretch)

- **Description:** This is the introductory track. It is a simple, wide oval with two gentle, sweeping turns that act as a "drift tutorial." The environment is a flat, open area surrounded by a simple city skyline.
- **Objectives:**
 - Complete 3 laps.
 - Collect 20 Diamonds.
 - Learn the basic drift and boost mechanics.
- **Challenges:** The main challenge is learning to hold a single, long drift through the entire 180-degree turn without losing control. The diamonds are placed in a perfect arc to teach the player the optimal line.

Level 2: "City-Plex"

Description: This is just the highway. Easy. Long but fast drive, need to be careful with the steering.

- **Objectives:**
 - Complete 2laps.
 - Collect 25 Diamonds.
 - Achieve a target lap time.

Challenges: This track tests the ability to go fast but not too fast. The player needs to balance their speed so that they can drift on time and collect the diamonds.

Level 2: "City-Plex"

- **Description:** This track is set within a tight, urban environmen. It features a series of 90-degree turns, like a city block.
- **Objectives:**
 - Complete 3 laps.
 - Collect 25 Diamonds.

- Achieve a target lap time.
- **Challenges:** This track tests "chain drifting"—the ability to quickly end one drift and initiate another in the opposite direction. Walls are close to the track, punishing any loss of control. Some diamonds are placed on tight inside corners, forcing the player to master a close drift.

4. Environment & Levels

Level 4: "Mountain Pass" (stretch goal)

- **Description:** This is an advanced track based on classic Japanese "touge" or mountain pass racing. It is a point-to-point downhill run (that magically loops back to the start).
- **Objectives:**
 - Complete the run in under the target time.
 - Collect 75 Diamonds.
- **Challenges:** This track features a mix of tight hair-pin turns and fast, sweeping "S" curves. The track is narrow, and guard rails are the only thing separating the player from a steep drop (a visual-only hazard). This level is the ultimate test of drift control and speed management. Diamonds are placed on the late apex of turns, forcing the player to perfect their drift timing.

5. Visual Style

Art Style

The game will use a 3D, low-poly art style for the environment. This is a deliberate choice to ensure a comfortable, headache-free VR experience. A simple style with "bright colors" and "clear track edges" guarantees the game runs at a high, stable frame rate, which is the most critical factor for VR comfort.

This simplicity will contrast sharply with the car's interior. In VR mode, the cockpit will be the player's entire view. Therefore, the car models will be high-fidelity, with detailed dashboards,

steering wheels, and interiors.

Contribution to Theme

The visual style supports the two-mode gameplay:

- **Normal Mode:** The bright, simple, arcade-like visuals make it clear this is a fun, accessible racing game.
- **VR Mode:** The detailed, high-quality cockpit (seen in assets like "[HQ CyberPunk Car](#)" and "Automotive HMI Template") grounds the player and creates a strong sense of immersion. This "grounding" (having a static, high-detail object around the player) is another key technique for preventing motion sickness.

5. Visual Style

Inspirations and References

- **Main Menu:** The main menu art will be based on the "[CyberpunkSunset](#)" 2D asset to establish the game's neon-lit, arcade-future theme immediately.



- **Car Interiors:** The inspiration for the VR cockpit will be high-quality, realistic assets like the "HQ CyberPunk Car" and "Automotive HMI Template".



- **In-Game Environments:** Medium/Low-poly, minimalist 3D art with a strong focus on color and light, designed for readability.

6. User Interface (UI)

UI Design Overview

The UI design is split based on the two game modes. The goal is always to be clean, intuitive, and, above all, comfortable.

Main Menu

The first screen the player sees will be a simple menu set against a stylized 2D art background, based on the "CyberpunkSunset" asset. This will immediately set the game's theme.

The menu will have two large, gamepad-navigable buttons:

- "Normal Mode"
- "VR Mode"

After selecting a mode, the tutorial will begin.

Normal Mode UI (HUD)

In normal (3rd-person) mode, the UI will be a standard, non-intrusive Head-Up Display (HUD).

- **Speedometer:** In the bottom-right corner.
- **Lap Time / Lap Count:** In the top-right corner.
- **Diamond Count:** In the top-left corner.
- **Boost Meter:** A simple bar near the speedometer.



6. User Interface (UI)

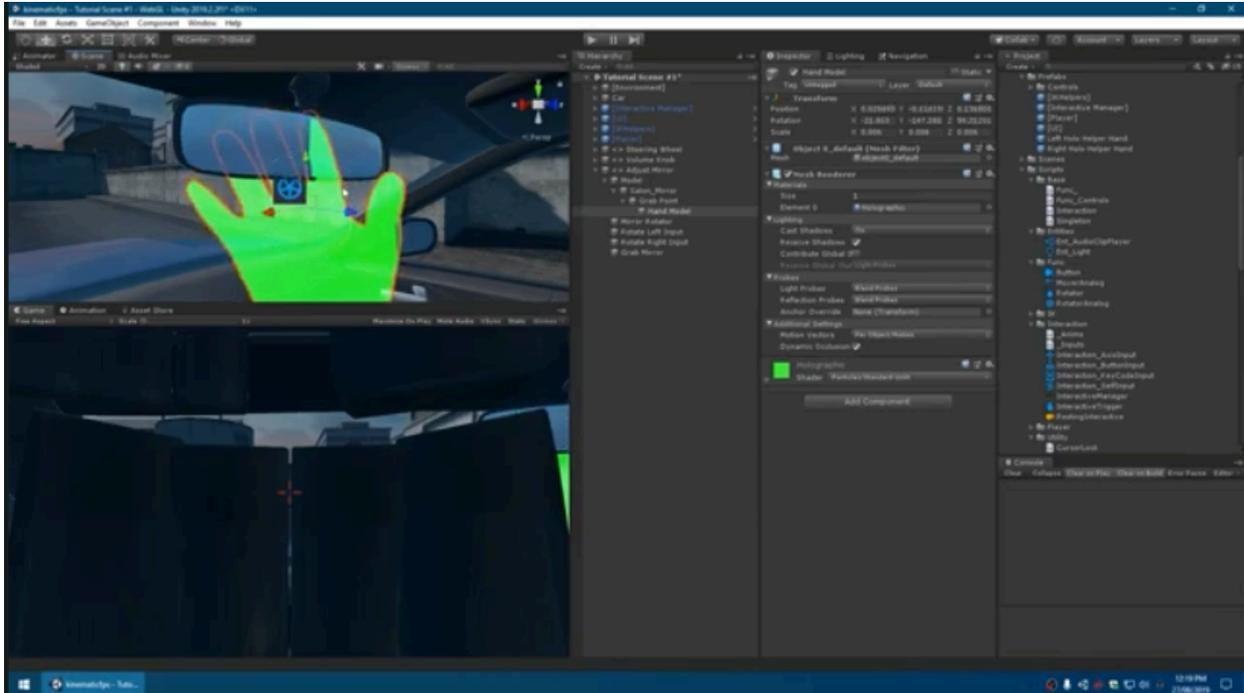
VR Mode UI (Diegetic & Contextual)

In VR mode, there will be no 2D, screen-locked HUD, as this is a primary cause of eye strain and breaks immersion.

- **Diegetic Interface:** All primary information is on the car's dashboard.
 - **Speed/Boost:** Shown on the digital speedometer, inspired by the "Automotive HMI Template".
 - **Lap Time/Count:** Shown on a separate dashboard screen.
 - The player must physically look down at the dashboard to see this information.
- **Startup Sequence UI:** At the start of a race, contextual prompts will appear on the relevant objects (e.g., "Press [D-Pad Left] to Adjust Mirror," "Press [B] to Start Radio").
- **Tutorial Pop-ups:** At the start of the first race, slight, non-intrusive pop-ups will appear *in the world-space* (e.g., floating next to the steering wheel). They will **not** be locked to the player's head. These pop-ups will explain the controller layout (e.g., "Press [X] to Drift").
- **Pause Menu:** The pause menu will be a simple 2D panel that floats in front of the car, controlled with the gamepad.

KINERACTIVE Unity Asset:

<https://assetstore.unity.com/packages/tools/animation/kineractive-153144>



7. Technical Considerations

Target Platforms

- **Primary:** PC (Windows)
- **Secondary:** PC VR (via SteamVR and OpenXR)

Development Engine

- **Engine:** Unity (Version **2022.3.62f3**)
- **Language:** C#

Key Technologies and Tools

- **VR SDKs:** Unity's OpenXR plugin to manage VR head tracking.
- **Unity Input System:** To manage gamepad controls for both Normal and VR modes (e.g., PS5, Xbox controllers).
- **iVry:** This tool will be used for testing with mobile or other non-standard VR headsets.
- **Key Art Assets:**

- "[CyberpunkSunset](#)" (for main menu background)
- "[KINERACTIVE](#)" (for car interior models, interactions)
- "[Demo City By Versatile Studio \(Mobile Friendly\)](#)"



Performance & Comfort Constraints

- **Non-Negotiable Frame Rate:** The game **must** run at a minimum of 90 FPS in VR at all times. This is the top technical priority to prevent headaches and motion sickness.
- **Optimization:** The low-poly environments are the primary strategy for achieving this stable frame rate.
- **No Artificial Camera Movement:** In VR mode, the camera must **only** move with the player's 1:1 head tracking. All other motion (like acceleration, braking, or drifting) must *not* add artificial camera shake or "head bob."

- **Physics Tuning:** Physics must be stable. The car must feel "heavy" and not "get sent flying" when crashing.
- **Crash Handling (VR Comfort):** As stated in *Game Mechanics*, all disorienting crash motion will be prevented by an instant "fade to black" and reset system.

8. Development Roadmap (4-Week Schedule)

This plan outlines a compressed 4-week schedule, possible because a core driving system and track environment are already complete. The scope is reduced from 3 levels to 1 polished level.

Project Lead: Georgi Tsvetanski (It's me!)

Phase 1: VR Integration & Core GDD Mechanics (Week 1)

- **Tasks:**
 - Set up the Unity project (Version 2022.3.62f3) with the OpenXR package.
 - Integrate the high-fidelity cockpit model
 - Implement the core VR camera (head-tracking only) inside the new cockpit, separate from my existing [CarCamera.cs](#).
 - Implement the "startup sequence" mechanic (mirror, radio, gear shift) and the "fade to black" comfort crash system.
- **Milestone:** A build where the player can sit in the new cockpit in VR, perform the startup sequence, and drive around the existing track.

Phase 2: Gameplay & UI Implementation (Week 2)

- **Tasks:**
 - Tune the existing [DriftBehavior.cs](#) physics to feel "heavier" and prevent the car from "flying" on bumps.
 - Place all "collectible diamonds" on the existing city track.
 - Implement the diegetic UI (dashboard readouts for speed/laps) using the "KINERACTIVE" for interactions.
 - Implement the main menu using the "CyberpunkSunset" asset, possibly find cool transitions for between scenes.

- **Milestone:** The full game loop is playable. The player can go from the menu, start a race, collect diamonds, and see the UI on the dashboard.

Phase 3: Comfort Testing & Polish (Week 3)

- **Tasks:**
 - **VR Comfort Testing (Highest Priority):** Test extensively to find *any* "headache-inducing" design.
 - Confirm there is zero artificial camera shake (a common VR sickness cause).
 - Test the "fade to black" crash system repeatedly to ensure comfort.
 - Bug Fixing: Address issues with physics, UI, or the startup sequence.
 - Add sound effects (engine, drift, music).
- **Milestone:** A feature-complete, comfortable, and stable game build.

Phase 4: Final Optimization & Build (Week 4)

- **Tasks:**
 - **Performance Optimization:** Profile the scene and scripts to lock the frame rate at 90+ FPS in VR.
 - Final polish on lighting and track visuals.
 - Build and package the final submittable .exe file.
- **Milestone END**