**SpaceMan64**

**Design Document for:**

# SpaceMan64

That’s what happens when you meet an irresistible force.

**“I’M LEO LUSTER BABY”™**

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# **Design History**

This is a brief explanation of the history of this document.

In this paragraph describe to the reader what you are trying to achieve with the design history. It is possible that they don’t know what this is for and you need to explain it to them.

## **Version 1.10**

Version 1.10 includes some tuning and tweaking that I did after making my initial pass at the design. Here is what I changed.

1. I rewrote the section about what systems the game runs on.
2. I incorporated feedback from the team into all parts of the design however no major changes were made.
3. Just keep listing your changes like this.

## **Version 2.00**

Version 2.00 is the first version of the design where a major revision has been made now that much more is known about the game. After many hours of design, many decisions have been made. Most of these large design decisions are now reflected in this document.

Included in the changes are:

1. Pairing down of the design scope. (Scope, not design)
2. More detailed descriptions in many areas, specifically A, B and C.
3. Story details.
4. World layout and design.

## **Version 2.10**

Version 2.10 has several small changes over that of version 2.00. The key areas are in many of the appendixes.

Included in the changes are:

1. Minor revisions throughout entire document.
2. Added “User Interface Appendix”.
3. Added “Game Object Properties Appendix”.
4. Added concept sketch for world.

# **Game Overview**

## **Philosophy**

### **Philosophical point #1**

This game is trying to achieve a fun zero gravity racing experience in virtual reality. We think that virtual reality is the way forward for game design and we wanted to incorporate it into our game.

### **Philosophical point #2**

Our game runs using the oculus rift and leapmotion. This gives users an immersive experience and gives them the sense that they have complete control of their spaceship.

## **Common Questions**

### **What is the game?**

This is a racing game where the objective is to pass through the checkpoints as quick as possible. The game is similar to a classic arcade racing game with leaderboards to compare times and try be the best racer in zero g.

### **Why create this game?**

To use new technology in an interesting application.

To take part in what we feel will be the future of games while it is still at such an early stage of development.

To build an immersive and fun game that would be both gratifying and challenging to make.

### **Where does the game take place?**

In a remote quadrant of space called the Skiin Dimension.

### **What do I control?**

The player character controls a spaceship in a 3D VR environment using Leapmotion. The spaceship is fast and maneuverable, allowing the user to glide and drift through space.

### **How many characters do I control?**

One.

### **What is the main focus?**

Passing through the objective waypoints as quickly as possible.

### **What’s different?**

This game runs on the oculus rift and uses a leap motion. Which gives it a very nice sense of novelty.

# **Feature Set**

## **General Features**

VR ready

Leap motion integration

Leaderboards

## **Multiplayer Features**

Does not have Multiplayer.

## **Editor**

Does not have an Editor, you would have to clone the repo and edit using Unity.

## **Gameplay**

Fly through rings.

Avoid Obstacles.

Avoid Npcs and their attacks.

Persistent Leaderboard.

Space Drifting.

Controlling with your hands.

# **The Game World**

## **Overview**

This quadrant is located in an unsecure sector of space, with no laws and no limits. People come from all over the galaxy to race their ships against each other using the mysterious gates that are scattered around the system. Lethal consequences await those who venture into Skiin unprepared, as there are asteroids and unruly spacefarers waiting to strike.

## Asteroids

The asteroids are littered around the system that act as obstacles in the race. Crashing into them can damage your ship and cause you to lose the race. Their placement is based on Perlin Noise, meaning every single time the game is loaded, the asteroids will be in the same place.

## Enemies

There are some very unfriendly space cowboys in the Skiin Dimension looking to make some money by scavenging and attacking ships that dare come into their Quadrant. They will shoot at you and lower your health, and may cause you to lose the game.

## Checkpoints

There are mysterious gates littered throughout the quadrant. For millenia, the brave and daring have come from all over to use these gates to prove their racing mettle.

## **The Physical World**

### **Overview**

The physical world is a quadrant of space littered with asteroids, checkpoints and enemy’s. Space is endless, but the further you venture out, the emptier space will become

### **Key Locations**

Skiin is the name of the location the game takes place in. It is a location that has been used by space travellers for thousands of years to race against each other and prove their might.

### **Travel**

The player moves through their world in their spaceship. They can fly in any direction, and the goal is to fly through the gates as directed by their ship.

### **Scale**

The game takes place in space, so the scale of the game is huge. But the environment is a quadrant of space packed with asteroids and checkpoints.

### **Objects**

Asteroids, checkpoints and enemies are scattered around the game world.

Asteroids move and rotate around the game world and acts as obstacles to the player. If the player crashes into them they take damage and can lose the race. Enemies wander near the checkpoints that will fire at the player and try to kill them. The checkpoints mark the players progress in the race, and give the player extra time to complete the course.

### **Time**

The player has to reach the end of the course in a time limit. That time is extended when the player goes through a checkpoint.

## **Rendering System**

### **Overview**

We use the standard Unity rendering system.

### **2D/3D Rendering**

Unity 3d rendering engine.

## **Camera**

### **Overview**

The Camera we used is a variation of the main unity camera, which allows it to be used with the leap motion and tracked onto the oculus rift. We need this because there is both a rendering camera, to render the environment, as well as a ‘centre eye anchor’ and ‘Leap Hand controller’ to both follow the players head movement, and place the players hands in this virtual space.

### **Camera Detail #1**

The Camera is a child of the ship, so it will always remain in the cockpit. There are no special camera movements within this game, this is due to a thing called ‘Simulator Sickness’ which causes nausea if the oculus camera is moved too much without the player moving their head. It’s akin to sea sickness.

## **Game Engine**

### 

### **Overview**

We are using the Unity game engine.

### **Game Engine Detail #1**

Unity helps you achieve ongoing success.

### **Water**

There is no water in space, it would freeze.

### **Collision Detection**

Our game detects three types of collision, flying into an asteroid, being shot by enemy ships, and flying through a checkpoint. These three types of collision are handled separately.

## **Lighting Models**

### **Overview**

We are using the standard Unity Lighting engine.

### **Lighting Model Detail #1**

We are using three suns to light the world.

### **Lighting Model Detail #2**

We are also using a directional light to help the player see inside their ship.

# **The World Layout**

## **Overview**

The world layout consists of two parts, asteroid placement and track placement.

## **World Layout Detail #1**

The asteroids are placed procedurally using a perlin noise wave.

## **World Layout Detail #2**

The tracks are placed after the world is generated depending on the difficulty setting chosen by the player.

# **Game Characters**

## **Overview**

The main character's name is Leo Luster. He is an irresistible force, known as the swingenest thing from coast to coast on his homeworld. Picture perfect, every sentient organisms dream. He has decided to try his perfect hands at space racing.

## **Creating a Character**

You cannot create characters.

## **Enemies and Monsters**

The enemies in this game world are other ships that wander near the gateway looking for racers to attack and scavenge from. They won’t hesitate to attack anyone who approaches the gates.

# **User Interface**

## **Overview**

The UI is made up of five parts, a countdown timer to track the time the player has to make it to the next waypoint. A countup timer to track how long the player has been playing. A speedometer to track the player's shields. A shields bar to track the players remaining health and finally an arrow to guide the player to the next checkpoint.

## **User Interface Detail #1**

The UI is placed on the windows of the spaceship to add to the immersion

.

## **User Interface Detail #2**

The UI is split across 3 screens and changes with the game's state to avoid clutter.

# **Musical Scores and Sound Effects**

### 

## **Overview**

The game has a techo soundtrack and uses sound effects for the player crashing, getting shot and passing through a checkpoints.

## **3D Sound**

We use the Unity 3d sound system.

## **Sound Design**

We took a variety of sound effects and music from a wide range of places, to achieve the specific sound feel that we wanted. Slightly retro with a twist of 80’s synth.

# **Single-Player Game**

## **Overview**

The player chooses their difficulty and a track spawns. A countdown timer begins and once it hits zero the race starts. The player must avoid asteroids and enemy fire to make it to each of the checkpoints on the map. The player has a shields bar and a countdown timer, if either of these hit 0 the player has lost. If the player makes it to the final checkpoint they have won and their scores will be compared to the leaderboard to see if they can take a place on it.

## **Single Player Game Detail #1**

Players will compete asynchronously for leaderboard positions

## **Single Player Game Detail #2**

There are three difficulty settings, easy medium and hard

## **Story**

Leo Luster, the swingenest thing from coast to coast on Planet CongoBongo, has decided to try his perfect hands at space racing. He has come to the Skiin quadrant, located in an unsecure sector of space. People come from all over the galaxy to race their ships against each other using the mysterious gates that are scattered around the system. Lethal consequences await those who venture into Skiin unprepared, as there are asteroids and unruly spacefarers waiting to strike.

## **Hours of Gameplay**

The game should only last a few minutes at most, but mastering it can take hours upon hours..

## **Victory Conditions**

The player must pass through each of the checkpoints in order and make it to the final checkpoint to win.

# **Character Rendering**

## **Overview**

We use the Unity rendering system to render the ship the player character is flying.

## **Character Rendering Detail #1**

The player ship is based on the land speeder from the stars wars

## **Character Rendering Detail #2**

The players hands are rendered via the leap motion