Stellar Grand Prix

SIGGRAPH UCF

Version 1.0.0

Created: March 20, 2016

Last Updated: March 20, 2016

Table of Contents

[Project Overview 3](#_Toc446334412)

[Executive Summary 3](#_Toc446334413)

[High Concept 3](#_Toc446334414)

[Core Gameplay 3](#_Toc446334415)

[Genre 3](#_Toc446334416)

[Target Audience 3](#_Toc446334417)

[Team Members 3](#_Toc446334418)

[Game Overview 4](#_Toc446334419)

[Overview 4](#_Toc446334420)

[Story 4](#_Toc446334421)

[Gameplay 5](#_Toc446334422)

[Controls 5](#_Toc446334423)

[Difficulty 5](#_Toc446334424)

[Racing 5](#_Toc446334425)

[Combat 5](#_Toc446334426)

[Powerups 5](#_Toc446334427)

[Hazards 6](#_Toc446334428)

[Win and Lose Conditions 6](#_Toc446334429)

[Death 6](#_Toc446334430)

# Project Overview

## Executive Summary

The player is a space pilot participating in a space against other spaceships.

## High Concept

The game mixes futuristic sci-fi racing with realistic space physics.

## Core Gameplay

One to four player racing where players pilot spaceships that fly around a near-frictionless environment

## Genre

Racing

## Target Audience

Older children and adults

## Team Members

# Game Overview

## Overview

A spaceship racing game with Newtonian physics. The main takeaway from this is that when a spaceship starts moving, it will continue to move unless the player directs thrust in the opposite direction. This can make the spaceship challenging to control. In addition, spaceships will be equipped with weapons, and will find powerups along the track that the player will be able to use

## Story

It is the year 2552. Companies from various human colonies throughout the galaxy have begun pushing for better and faster interstellar mobilization technologies. These technologies are put to the test in the Stellar Grand Prix, where racers fly spaceships in a race to the finish.

# Gameplay

## Controls

* Xbox Controller
  + Left Thumbstick – Forward/Backwards/Strafe/Elevate
  + Right Thumbstick – Yaw/Pitch/Roll
  + A – Use Powerup
  + Right Trigger – Main Weapon
  + Left Trigger – Secondary Weapon
* PC/Mac
  + Arrow Keys – Forward/Backwards/Strafe/Elevate
  + W/S/A/D – Yaw/Pitch/Roll
  + Space – Use Powerup
  + Left Mouse Button – Main Weapon
  + Right Mouse Button – Secondary Weapon

## Difficulty

Difficulty will depend primarily on the player’s ability to control his ship and the complexity of the track course.

## Racing

The main objective of the game is to be the first to reach the finish line. The player will fly a spaceship in an enclosed course. The main challenge is avoiding gunfire from other players, environmental hazards, and maintaining control of the player’s ship. Spaceships will be subject to Newtonian physics, which means that when the ship begins to move, it will continue to move until the player sets thrusters in the opposite direction. The ship’s various functions are divided among vulnerable components. If a component is destroyed, it will no longer be able for perform its function. A destroyed engine will impact navigation. A destroyed weapon will limit offensive capabilities.

## Combat

The player’s ship will be equipped with a primary weapon and missiles. The primary weapon is a laser gun, and its specific attributes vary from ship to ship. In one case, shots will be precise, and in another, the gun will be rapid firing, but can only fire continuously for a limited amount of time. In all cases, ammunition is unlimited. Missiles are limited, and must be replenished by finding pickups throughout the map.

Additional combat opportunities exist in the form of powerups located throughout the map.

## Powerups

Collected powerups can be deployed at any time to assist the player in achieving victory while hindering an unlucky target.

* EMP Mine
  + A target that collides with this will momentarily lose control of their ship
* MT Turret Array
  + The activator’s ship is surrounded by an array of musket-like turrets that follow the player. Pressing the Use Powerup button successive times will trigger a turret, after which the turret will fire a single shot then disintegrate.

## Hazards

Environmental hazards a track may have

* Breakable Glass/Vacuum
  + A large window looking out into space. If this glass pane is broken, a vacuum is formed, and ships too close to the edge will be sucked into the abyss of space. After a set amount of time, a force field is produced, eliminating the vacuum and making the area safe again
* Mashers
  + Self-explanatory
* Non-discriminatory self-defense turrets
  + Indestructible turrets that will fire at passing ships

## Win and Lose Conditions

To win the game, the player must be the first to complete the race. Lose conditions are if the player does not finish the race with first place.

## Waypoints

A chain of invisible “waypoints” are placed throughout the course. This will primarily be used for assistance in indicating the player’s progression on the course, but could also be used for AI navigation and post-death velocity prediction

## Death

In addition to the health of the ship’s various components, the ship also has a “main” health system. If the ship’s health reaches 0 or if it crashes into a wall at sufficient speed, the player’s ship is destroyed, and after a few seconds, the player will respawn, with the position based on the player’s speed at the time of death and the nearest waypoint

# Menu Layout

## Gameplay HUD

The main HUD is minimal, as it will feature:

* The player’s position in the race,
* Progression in the course,
* Energy reading for the primary weapon
* Missile count
* Collected powerup, if any