CSC3020H

Game Design Document

Inter-Stellar Racing (ISR)

Pure Adrenaline. Pure Racing.

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Table of Contents

Informative Layer

Name:

Inter-Stellar Racing (ISR)

Concept:

A racing game in which futuristic ships/pods race along light-bridges in space while attempting to hinder opponent's ships with power-ups acquired throughout the race. Finishing first is still the ultimate goal.

Intended Audience:

Casual racing game players and those interested in action. This targets players of all ages particularly those aged 5 and up. Including a futurist setting yet keeping cartoony aesthetic and simple controls that anyone can simply pick up and play will allow for the game to have a wide reach.

The Player's Role:

The player is a driver in the ISR Galactic championship who has the goal of winning the race. The player may choose the ship of their choosing and then race against other ships. Players may exploit certain 'power-up' items scattered around the track in order to hinder their opponents and claim victory.

Executive Summary:

A three-dimensional futuristic racer in which players compete with each other as well as artificial intelligence to finish in first place. The race is set in space with the players controlling a form of space ship and racing them along a special light-bridge based track. Players compete with each other not only by racing, but also with the aid of deadly power-ups distributed along the track.

Power-ups will allow players to deal damage to another player or otherwise inconvenience them. When a player's health reaches zero they are automatically reset with no velocity, causing them to lose precious time. A racer will also incur a reset if they were to move off of the track at any point. Power-ups will appear along the track at set positions, however the power-up that appears at each point will be completely randomised and all power-ups will reset when a new lap is started.

Up to four players will be able to participate at the same time by making use of split-screen multiplayer. A race can have up to eight racers participating; all those who are not human players will be controlled by artificial intelligence. Players will be able to force each other off of the track as well as use power-ups against each other to force opponents to fall behind. The first player to cross the finish line on the final lap is the winner.

A fully integrated menu system will accompany the game, with the primary menu being controlled solely by player one and the in-game menu being assigned to each individual player. The player initiating a pause in the game must be the one to resume it. The game will also feature sound effects and background music as well as a competitive track design that will be based off an existing formula one track.

Gameplay Layer

Genre:

The primary genre of this game is the **Racing** genre.

Sub-Genre:

More specifically this game would fall under the **Futuristic Racing** genre. This genre is described as a racing game which involves the use of futuristic vehicles and tracks, as well as often making use of weapons and/or power-ups.

Core Mechanic:

The core mechanic of Inter-Stellar Racing is the similar to most games within the racing genre game: progressing along the track as quickly as possible in order to cross the finish line before any of the other competitors. Differentiating the game, however, is the addition of health and power-ups. Both of which significantly alter the experience.

Feature List:

- Well-designed track
- Split-screen multiplayer
- Power-ups
- Player health
- Sound
- Winning/Losing conditions
- Menu System

Feature Synopsis:

- **Well-designed Track:** The track will be designed to allow equal chances for different play styles. It will contain three sections: straights; tight corners; winding tracks; quick corners; slopes. When put together these will allow players to race in a technical manner by breaking into and accelerating out of corners and watching their racing lines while also supporting players who just want to drive on a fun and interesting track with straights and corners to drift around.
- **Split-screen multiplayer:** The game's multiplayer will make use of split-screening. For two players the split will be horizontal, i.e. player one will get the top half and player two the bottom half. It will support up to four players.
- **Power-ups:** The game will offer a variety of different power-ups which will be available to all players as well as the AI controlled opponents. Power-ups will spawn on the track and players/AI can pick them up by driving into them. Power-ups will be used upon acquisition. Any power-up held will be overridden if the player/AI were to collect a new power-up. Power-ups will be as follows:
    - A mine collectable which allows a player to drop a mine behind them for opponents to collide with, the power-up would allow the player a certain amount of time in which t drop it. This will damage the victim's health.

- A lightning collectable which would cause a lightning bolt to hit the player immediately in front of the user. Or in the case of the leader of the race it will target the player immediately behind. This will damage the victim's health.
- A rocket collectable which will allow the user to fire a rocket at the opponent directly ahead of them. The rocket will home in on an opponent; however, it will have limited turning capacity and will only home in for a certain amount of time before disappearing. If it hits the opponent it will damage their health.
- A wormhole collectable will teleport the user to a random position on the leader board – the user will be placed between the opponents of the next corresponding leader board placements.

- **Player Health:** Each player/vehicle will have a set uniform health value. Health will be reduced by opponent's power-up hits as well as from collisions. In the case of collisions the damage will be determined by the speed at which the collision took place. Once the player's health is depleted, they will 'reset' on the track, near their last known position with full health and zero speed.
- **Sound:** The game will feature background music as well as sound effects. Background music will also be played in the menus. The style of music will be electronic in order to fit in with the futuristic theme.
- **Winning/Losing Conditions:** The game is won by being the first to cross the finish line. Following that placing will be shown at the end of races in order to display how well players did in the race. Only one entity (human or AI) can win each race; other players have lost.
- **Menu System:** Fully featured menus will be available throughout the game. A menu will always be available to any player. Pre-game menus will allow player one to choose the mode, track and number of players and then from there all players will be able to choose their vehicles. In-game any player will be able to pause the game and bring up the in-game menu. The in-game menu will allow the game to be ended and return players to the pre-game menu. In a multiplayer game, the player who exits will have his/her viewport vanish as he/she has their vehicle taken over by AI. The remaining players will be able to continue racing as their viewports will be modified to remove the one player. In a single player game, when the player opts to exit during a race the game will simply return to the main menu.

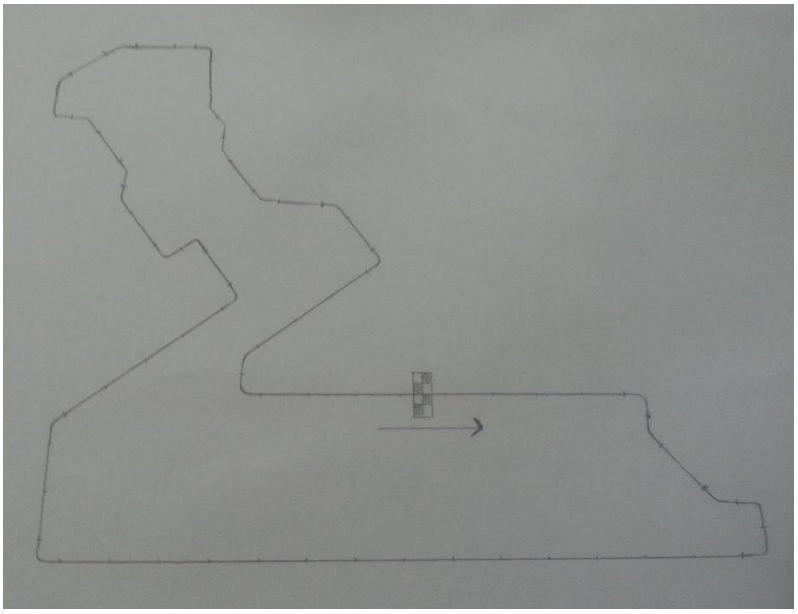
Interaction Models/Modes:

All races take place on the ISR Grid track and are available in single player and split screen multiplayer.

- Circuit races – Drivers do laps around the track and all racers place in the order that they cross the finish lane. The driver that crosses the finish line first on the final lap is declared the winner.
- Sprint races – Drivers race along a pre-selected portion of the track. This mode only has 1 lap and may not encompass the entire track.

Level Design:

The game's racing track, the ISR Grid, will be based our track off of a current real-world track as this ensures that it is correctly setup to be a challenging racing circuit. The Grid will be based on the Indian Grand Prix track.



Artificial Intelligence (AI):

The remaining ships of the original eight that are not controlled by real players will be controlled by the AI. Each ship will attempt to follow a pre-defined racing line and will have the ability to collect and use power-ups. This will be affected by the ship's position in the race, as well as what power-up it is. Ships will collide with each other, in this case the direction of one ship will have to conform to the direction of the other; this will be worked out based on each of their directions and speeds. Collisions will also cause a decrease in speed. The racing line will consist of a series of connected points. The AI controlled ships will target the points; if they pass the point without making contact with it they will still target the next point.

Game Logic/Rules:

- Ships maintain a minimum altitude above the track.
- Ships will drift uncontrollably if they leave the track.
- First ship across the finish line wins.
    - Team points, (from placement), determine winning team.
- Certain offensive power-ups can lead to a decrease in an opponent's health. Specifically: lightning, mines and guns will lower the opponent's health if employed correctly.
- Zero health will initiate a 'respawn' or reset, in which the player loses time as they are warped to the centre of the current portion of the track and reduced to zero speed. The player's health will then return to 100%.
- Each ship can only have one power-up at a time which is activated by pressing a button on the controller.

- Ships acquire BURST during play; BURST can be used to speed up the ship dramatically. Players can activate BURST by pressing a button on the controller. When activated, BURST decreases in exchange for a boost in speed. BURST is gained naturally throughout the race.

Story Layer

Premise:

Broadcasted on television for the entire galaxy to see, the ISR Championship is a celebrated tournament. Equal parts exhilaration and danger, this fast placed racing league has trillions of followers and is hailed as the leader in sports entertainment.

Setting:

Inter-Stellar Racing takes place in a remote sector of the galaxy. The greatest racers of the sector have gathered in order to claim top prize in the most prestigious racing league in existence. The ISR drivers compete for fame and fortune and will race for the enjoyment of its legions of fanatics across the sector. Each driver has their own motivation for joining and each will stop at nothing in order to win. Facing a potentially lethal course, the racers must also face the biggest danger of all: each other.

Presentation Layer

User Interface:

Main Menu System

- Quick Race
- Race Day
- Multiplayer
- Settings

Quick Race will allow the player to jump straight into racing without having to select any settings. The game will fill in randomised settings and start.

Race Day will allow players to the race settings including: vehicle, number of laps, and number of opponents. After selecting parameters for the above fields they may proceed to the race. This mode allows players to tweak the race to their preferences.

Multiplayer comes in the form of split-screen for 2 – 4 players. Each player will require their own controller and the game will detect whether the system has enough controllers to support this mode. The mode itself will allow players to change settings with regards to vehicles selected, number of opponents and number of players. In the game the screen will be split vertically for 2 players with each player getting and equal share of the screen. For 3 players, each will get an equal sized viewport with 2 viewports in the top half of the screen and 1 viewport in the bottom half. In the case of 4 players the screen will be split into equally sized quadrants.

The settings menu item contains additional options for users to change the experience. Such as: inversion of the X axis for the controls and changing the details displayed in the interface such as units of measurement.

The following are sub-menus which can be entered by pressing a button while in the main game

Pause Menu

- Resume Race
- Quit to Main Menu

This menu will allow players to pause the game itself, stopping the updating of the system to allow for players to return to the main menu, adjust some preferences or simply take a break before resuming.

Heads Up Display (HUD)

- Speedometer
- Available Power-up
- Current Health
- Progress bar – maps track position of players

Camera Models:

- Chase Camera
- Hood/Bonnet Camera
- Reverse camera

Three different camera models will be used for this game. The default will be the chasing camera, or third person camera which will follow the ship around viewing it from a position behind and above it. It will have a smooth spring effect to avoid sharp direction changes. Another camera will be a first person camera which will situated at 'eye level' of the ship yet outside the cockpit, essentially beginning just outside the glass so as to include the hood or bonnet of the vehicle. The final camera will be the reverse camera situated behind the player's vehicle, looking at the area behind the craft. This functions as a rear view to see the opponents and the track behind the ship. Players will be able to change the camera model by pressing a button on the controller as well as in the settings. The reverse camera can be accessed via another controller button; it will only be active while the button is pressed.

Sound Design:

Sound will be incorporated into the menu system and into the final game. List of sound effects:

- Menu item selection
- Menu theme song
- In-game race song
- Crowd screams
- Vehicle engine rumble
- Vehicle gear shifting

- Power-up activate sound
- Power-up hit sound

Sound will most likely be outsourced with an external sound designer aiding the team in this regard.

Asset List:

- Track pieces (width of three ships)
  - Long straights – length of twenty ships
  - Short straights – five ships length
  - 45 degree turn - flat
  - 90 degree turn – flat, sharp turn
  - Starting piece – four and a half ships wide in centre, three ships wide at each end
  - Vertical screen/film for start – translucent, force-field like film that marks the start and finish line
  - Lights/Numbers for countdown – either lights going down to green or number countdown with animations
  - Side pillar – holographic in style; translucent (allows us to ignore collisions)
  - Race-line nodes – small glowing discs that mark the racing line points.
- Ships
  - Four unique models – each depicted with three different schemes. Each scheme includes a set colour, number and possibly a racing strip/pattern.
- Power-ups
  - Mine collectable – slow spinning animation
  - Mine model
  - Lightning collectable – slow spinning animation
  - Lightning bolt model – ten ship length
  - Rocket collectable – slow spinning animation
  - Rocket missile – futuristic, quarter the size of a ship
  - Wormhole collectable – slow spinning animation
  - Wormhole model – black disc with neon border, horizontal, big enough to envelope the ship
- Cameras
  - Small orb acting as a camera with a lens on it. It should be reminiscent of the current camera technology yet filtered through a futuristic and cartoonish lens. If all else fails it could look like a floating wireless video camera.
- Space elements
  - Very small glowing particles/orbs
  - Large space station for the background– very large ship which will act as the head quarters of the entire racing league.
  - Medium-Large sized television for displaying images of crowds watching all over the galaxy

Artistic Style:

The style of this game is very futuristic; simple shapes and surfaces with bright neon borders. Surfaces will mostly be single colours and glossy. Overall it should feel cartoonlike and simple but still very futuristic. Futuristic yet cartoony, each craft should contain some form of alien design but be kept simple to a large degree. The primary colours used should be dark grey/black and neon blue or gold. The track itself would be light-bridged style.

Planning Layer

Deadlines	13 / 05	**22 / 07**	29 / 07	05 / 08	12 / 08	19 / 08	26 / 08	02 / 09	**09 / 09**	16 / 09	23 / 09	30 / 09	**09 / 10**	**11 / 10**
GDD														
Level Design/Implementation														
Ship physics														
Racing mechanics														
Artificial Intelligence														
User Interface														
Website														
Sound Implementation														

The above Gantt chart shows what needs to be done by which deadlines and how the individual tasks are dependent on each other. Red dates are weeks with deadlines in them, or are deadlines themselves. Gray blocks indicate which weeks each task will be worked upon.