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Removal Protocol :Sabre

R.P.S

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Overview

This is an endless runner style game viewed from a first person perspective. The game takes place in space where the player is on a spacecraft with a fixed flight path. From the view of the cockpit, the player is challenged with continuous twitch encounters as obstacles enter the player's flight path. The player plays a minigame of rock paper scissor to resolve each encounter.

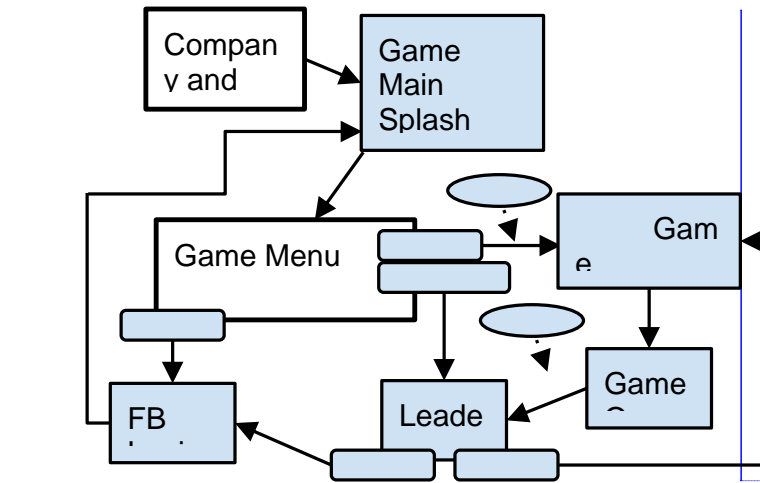
Platform

iOS
Android
Using UE4 - 4.6.1

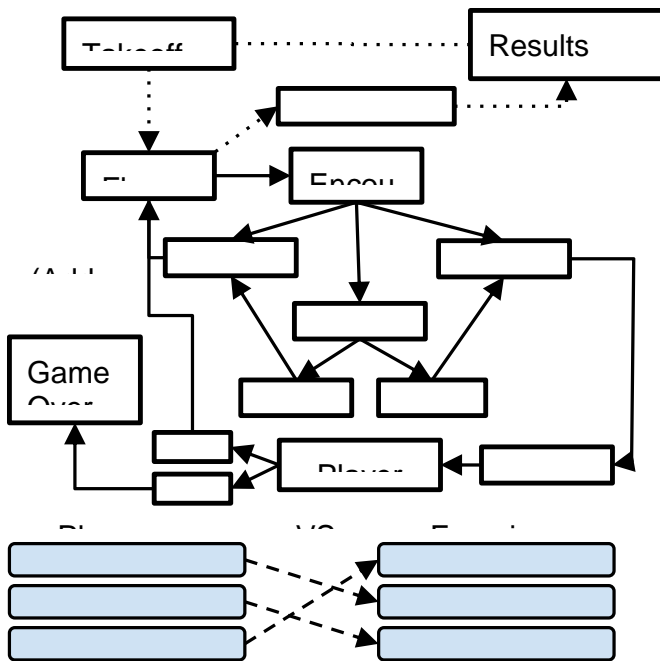
Development Challenges

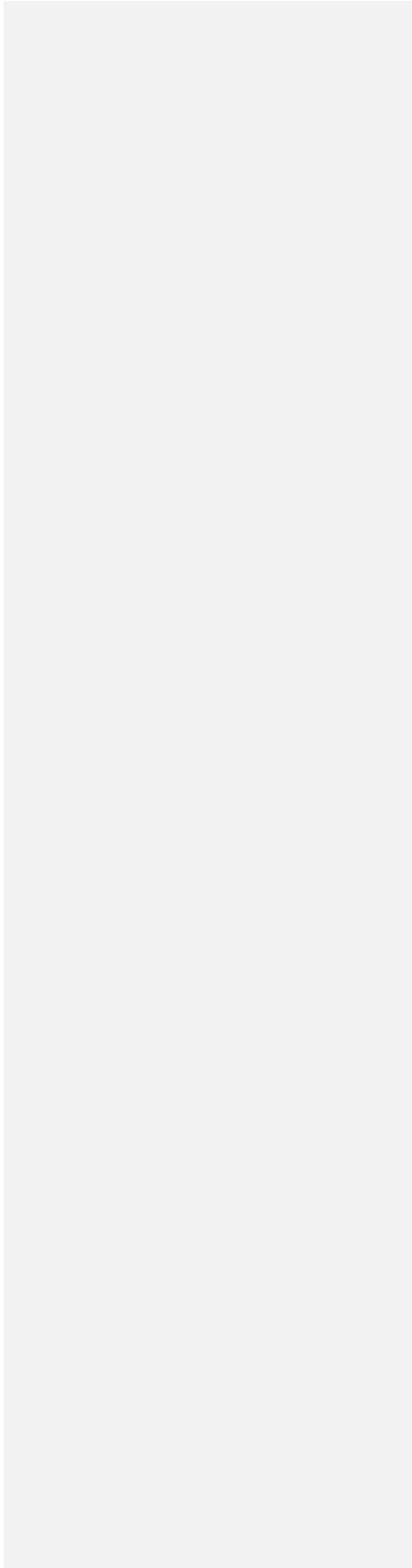
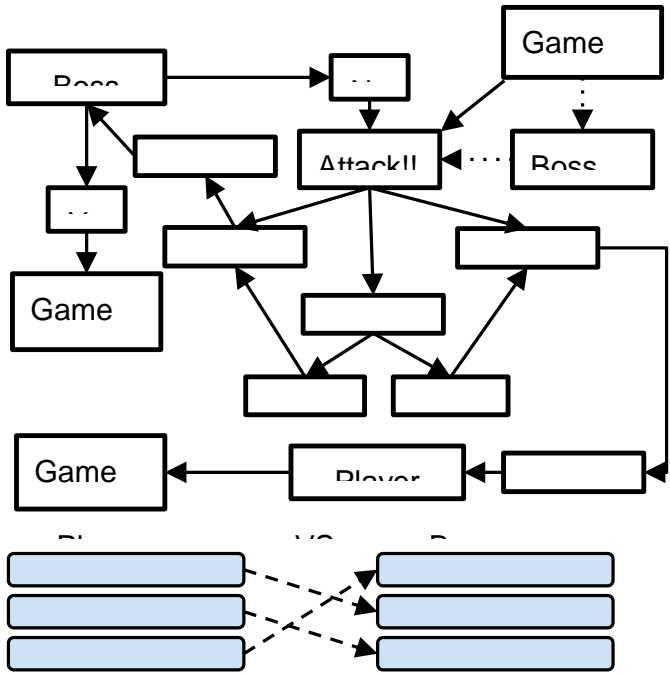
UE4 Matinee?
Social Media integration
Adding ads
Leader boards
Spline Navigation
Performance for mobile device using UE4

Flow of the game

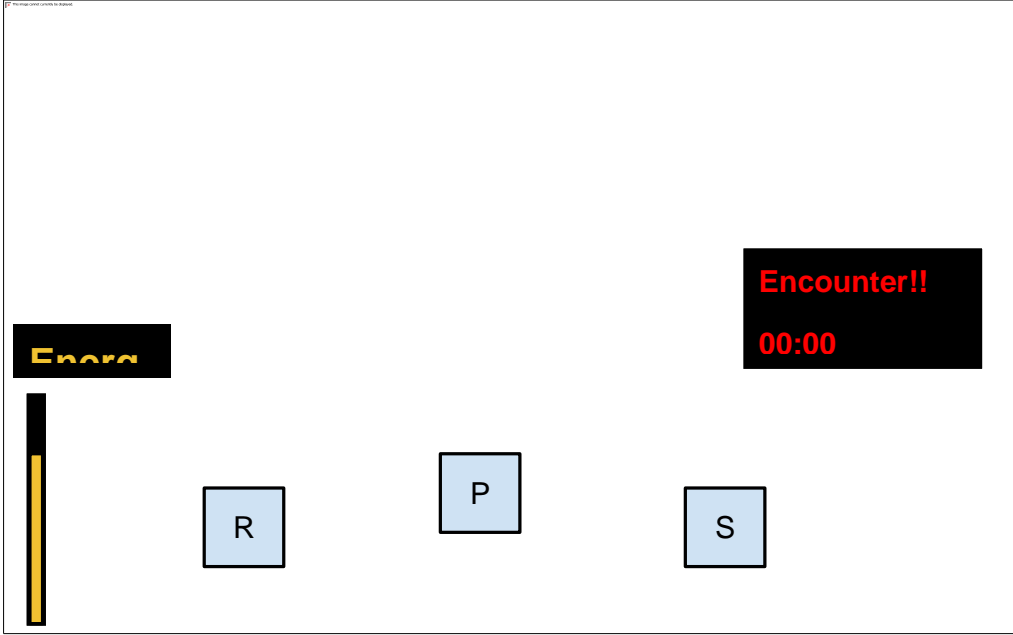


Comment [1]: No back to game menu, unless Facebook sync fails. Also probably more of a future addition, but would be nice to architect it to integrate with Game Center for IOS and Google Play games for leader boards as well. Sky Force for Android does a really nice job of this.

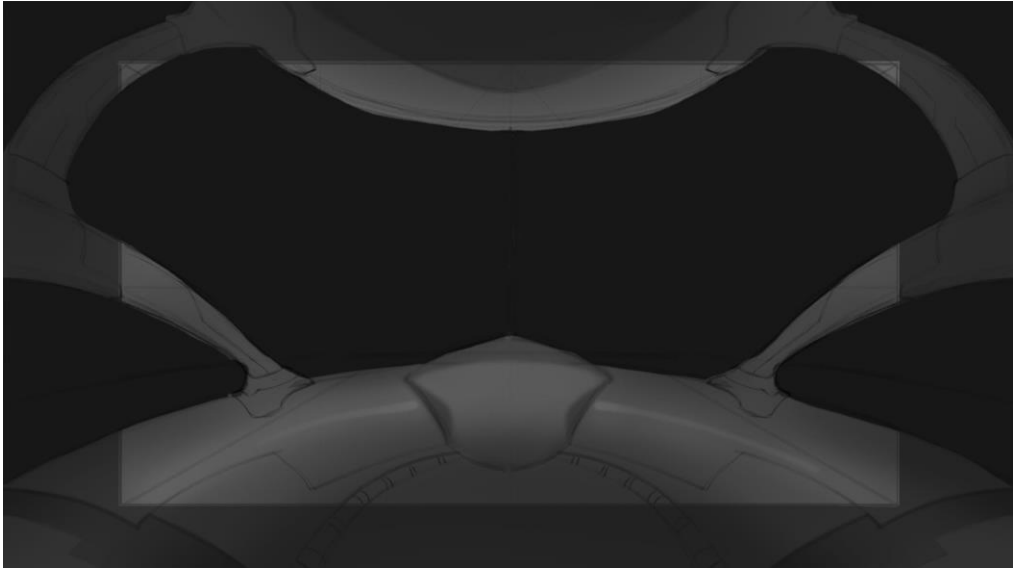




UI Layout

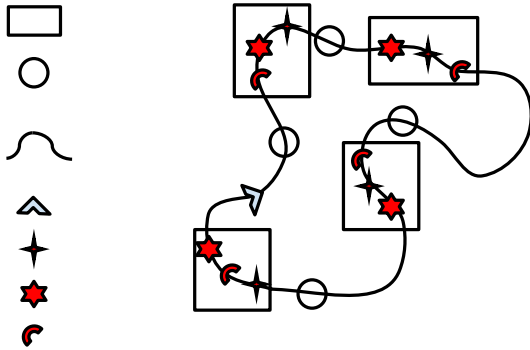


UPDATE 01: New hud concept WIP:



Level Design

Preset Encounter Level



Each environment volume is loaded once the spacecraft has entered a trigger volume. Obstructions can only be encountered at defined targets along the flight path within the volume. The encounter location within a volume is randomly picked from the locations predefined in the volume. This design for a volume is to allow minimal visual interference with the surrounding environment geometry which could otherwise conflict with the spacecraft's ability to dodge. This design requires having the spacecraft following a fixed loop spline.

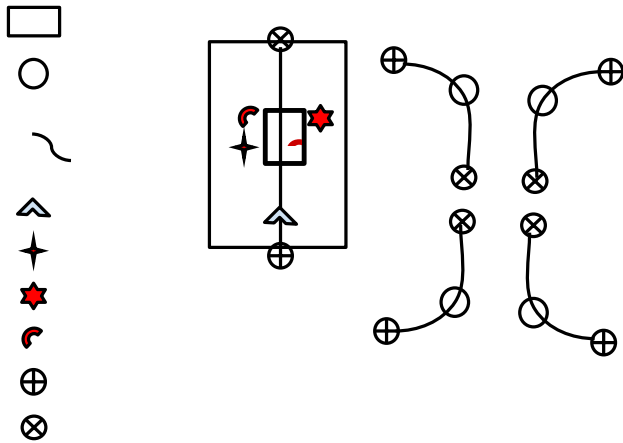
Pros:

- easy to test
- one volume accommodates each type of encounter
- requires no additional logic for pathing

Cons:

- heavily relies on spline following
- the smaller the flight path the more predictable
- level design dependent

Compartment Level



The environment volume is the only place an encounter may occur. The encounter always occurs at the same position along a straight flight path. At the start of the level the spacecraft enters the first environment volume. After the encounter a curved path is randomly selected with a trigger volume attached. A new environment volume is loaded once the spacecraft has entered the trigger volume along the curve path. Different curves and loops are used to create an infinite unpredictable flight path connected by the Entrance and Exit Nodes of each section.

Pros:

- Design flexibility
- can make non playable environment volumes for the curves
- allows for expandability and camera tricks later

Cons:

- encounters seem static
- need to design individual curve layouts and environments
- at least three environment volumes need to be created for each theme

Environment Volumes

The environment volumes consists of galactic debris, rock formation, planets and stars. Each volume may be themed in different ways but the elements in the volume must conform to the flight path. The theme of the volume dictates the visual for the encounter.

The boss fight reuses the encounter positions to determine when it attacks and what type of attack it will use. The level's environment geometry however is not visible. Minimal or simpler environment volume geometry is shown during boss fights instead.

Themes

Each environment volume has a theme as to which type of geometry will be shown.

~~Spacecraft graveyard~~

~~This theme is comprised of floating ship parts and drifting space pilots lost in a deep space~~

~~The Dump~~

~~This theme is comprised of scattered garbage sent into space by a neighboring planet.~~

~~The Dead Planet~~

~~This theme is comprised of the remains of a distant star that went super nova.~~

~~The Phantom Cosmos~~

~~This theme is comprised of colorful nebulae and small stars.~~

Themes

1. Galaxy (Far Away)
 - a. Includes Arch Colony
This theme has both space and space colony (Tech bits) in the level

2. Solar System (Medium Distance From Planet)
This theme is comprised of space mixed with planets and stars

3. Solar System (Approaching Planet and Moons)
 - o Main Planet
 - 2 Orbiting moons
 - 1 water
 - geo metal

Act I (World 1): Escaping the black hole

Act II (World 2): Discovery of habitable planet in neighboring galaxy

Act III (World 3): Approach to new world

Rules of the game

When the player enters the level the game starts in the **Fly Animation** state.

The ship starts every level with six units of energy.

Each normal encounter will appear as an object floating towards the spacecraft from the background to the foreground. The player will be notified when an obstacle is approaching by the reticled of the ship's targeting system. Player taps the icon on the screen representing their choice to defend the ship.

Each normal encounter is spawned at a random rate ranged from a set range in seconds. The spawn rate is determined when the game re-enters the **Fly Animation** state. When the calculated time has elapsed the encounter sequence begins.

****temporary equations used for example definitions****

Minimum Spawn Time = 1000 ms

Maximum Spawn Time = 5000 ms

Spawn Time = Random(Minimum Spawn Time ~ Maximum Spawn Time)

The ship's speed is fixed at the start of play.

The speed that each obstacle approaches the ship determines how much time the player has to respond.

****temporary equations used for example definitions****

Obstacle Speed = Play duration / 30 * (Random 1 ~ 10)

Time = (Obstacle Speed + Ship Speed) / Distance / 1000ms

If the player does not respond in time the ship loses two units of energy.

If the player responds incorrectly, the ship loses two units of energy.

If the player's response ends in a draw, the ship dodges and loses one unit of energy.

If the player's response is successful, the obstacle is removed from play. The ship regains one unit of energy.

Ten encounters occur in a level before the beginning of the boss fight.

Comment [2]: Some units would be nice, just to make sure everything works out. I know this is a bit nit-picky and most can be assumed, but helps clarify things and double check outcome in your head.

I think UE4 1 uu (unreal unit) = 1 cm; so I'm assuming speeds in this case are cm/ms, play duration is ms (makes sense as that is what you get from timer functions).

Also on the next line Time would be in seconds distance in cm.

Comment [3]: Isn't it Time = Distance/Rate?

Comment [4]: May one to reference "Can/Can't dodge" as seen in flowchart above. Guessing special enemy or something.

Each boss encounter acts as multiple normal encounters. The player must defend the ship multiple times until the boss is destroyed. Response time to defend from each boss attack is fixed based on the boss's level.

Attack Response time = boss level * 3 * 1000ms

When the player defeats a boss the current level is completed.

When the ship's energy reaches 0 the game is over.

How to play

Tap on the corresponding icon to defend the ship before the response time reaches 0.

Controls

Ship navigation is automatic.

Entity Descriptions and Behaviors

Rotating Objects

This obstacle is a flat object and appears rotating towards the cockpit.

When successfully destroyed:
The object is cut in half.

When ~~the~~ matched or failed:
The object rotates into the cockpit.

Large Obstruction

This obstacle is a large round mass moving towards the cockpit.

When successfully destroyed:
The object is pulled from the player's path.

When matched or failed:
The object continues to drift towards the cockpit.

Shooting Entity

This obstacle is an enemy spaceship which flies towards the cockpit while firing.

When successfully destroyed:
The object explodes.

When matched or failed:
The object shoots one last shot at the cockpit hitting the player spacecraft.

Boss

TBD

Spacecraft

This is the player spacecraft.

Weapons:

Fist shield - a weaponized shield that protects the ship while channeling the shield energy into a single shot.

Energy Field - A magnetic field used to pull obstructions out of the way.

Scissor Lasers - Dual laser beams use to cut through obstacles.

When dodging a Rotating Object:

The spacecraft speeds up to avoid the collision

When dodging an Asteroid:

The spacecraft goes over or under to avoid collision.

When dodging an Alien spaceship:

The spacecraft rolls left or right to avoid being shot.

Player Feedback

When a level is completed:

Armored shutters close over the glass of the cockpit. The "Level Complete" text is shown with the player's results and a message saying "tap to continue".

When the player takes damage:

The cockpit of the player's space ship begins to show damage. The level of damage displayed is determined by the amount of energy remaining. The energy bar of the ship flashes. The ship rocks and shakes from the collision.

Ship Energy affects the Hud display:

Full energy(6 units) = shows no damage to the ship.

Imperfection (5 units) = stage 1 damage

Two-thirds energy(4 units) = stage 2 damage

One-third energy(2 units) = stage 3 damage (system critical)

Stage 1 Damage Description:

- scratches and minor nicks in the glass.
- the cockpit shakes from the collision for 1 second.
- the sound of the collision plays with the shake.

Stage 2 Damage Description:

- cracks in the glass are shown.
- the cockpit shakes for 2 seconds during collision.

Stage 3 Damage Description:

- Energy bar pulses.
- The last node of energy flashes red.
- The spacecraft's alarm plays repeatedly.
- The cockpit starts to pulse glowing red.

When Player gets a Game Over:

Armored shutters close over the glass of the cockpit. The "Failed" text is shown with the player's results and a message saying "retry?".

When a player chooses successfully:

vs Rotating Object:

The scissor beams cross over the ???, the ??? is cut in half, the pieces go around the sides of the cockpit.

vs Large Obstruction:

The energy field wraps around the asteroid. The asteroid motion is stopped. The field moves the asteroid out of the ship's path based on a random direction.

direction = Random (1 ~ 4)

- 1) up
- 2) down
- 3) left
- 4) right

vs Shooting Entity:

The cockpit glows blue as the fist shield charges. the shots from the alien craft disappear into circular white collisions. The shield focuses into a blue glowing fist and fires into the alien space craft. the alien space craft explodes.

When the Player choice is a tie:

vs Rotating Object:

The cockpit shows the object speeding up towards the player as the spaceship moves faster.

vs Large Obstruction:

The cockpit shows the asteroid floating to the bottom as the spacecraft flies over it. The cockpit shows the asteroid floating to the top as the spacecraft flies under it.

vs Shooting Entity:

The cockpit shows space rotating counter clockwise when the spacecraft is rolling left. The shots fired by the alien spaceship fly to the right of the cockpit.

The cockpit shows space rotating clockwise when the spacecraft is rolling right. The shots fired by the alien spaceship fly to the left of the cockpit.

The roll on a tie is over compensated and the ship corrects itself to be level again.

When a boss enters the game:

The ship's cockpit glows orange as the text displays "Enemy Threat Detected". The boss flies into the path of the ship and stays a fixed distance from the ship.

Transitions and Cinematics

Level start

The armored shields covering the glass of the cockpit raise from bottom to top allowing the view of space.

Boss Entrance

The pilot camera is locked onto the boss as it flies in front of and around the side of the ship. The pilot camera follows the movement of the boss up to 75 degrees from its original forward direction. The space ship maintains its normal speed.

Lifetime and Social Media Integration

TBD after layout

Where will ads show?

Where will notification be to allow the user to sync to facebook?

When will leaderboards be shown? On demand or automatically after game over?

Assets

Naming Conventions

RPS_ASSETS_Spaceship_T_SpaceShip_D

RPS_ASSETS_Spaceship_MESH_Spaceship.FBX

RPS_ASSETS_Spaceship_MAT_Spaceship_MAT

Item Codes.

_MAT = Material

_T = texture

_D =Diffuse

_RGB=Special Spec/gloss/cavity 3 in 1 texture

_S= spec

_N= normal

_G= Gloss

_Mesh= Mesh/fbx file

2D Art

LevelComplete_01 - text to display level complete

LevelFailure_01 - text to display level failed

3D Art

Spacecraft - 3d cockpit

HUD Art

Weapon_01 - Button for weapon 1

Weapon_02 - Button for weapon 2

Weapon_03 - Button for weapon 3

EnergyMeterOutline_01 - container for the ship energy

EnergyMeterUnit_01 - a single energy unit

DisplayFont_01 - Font used to draw dynamic text to the screen

Animations

Audio

Music

BGM_01 - plays during MainMenu
BGM_02 - plays during game play
BGM_03 - plays after player wins
BGM_04 - plays after player loses

Ambient

Ominous Space sound - plays during game play
Thrusters - plays during gameplay

Sound Effects

EnemyDead_01 - Shooting Entity death sound
EnemyDead_02 - Boss death sound
Weapon_01 - Fire Weapon 1
Weapon_02 - Fire Weapon 2
Weapon_03 - Fire Weapon 3
BlastShields_01 - Shutter moving up
BlastShields_02 - Shutter moving down
DodgeRoll_01 - spacecraft rolls left / right
DodgePitch_01 - spacecraft goes over or under
DodgeBurst_01 - spacecraft boosts
DamageShot_01 - spacecraft gets shot
DamageHit_01 - spacecraft gets hit by rotating object
DamageHit_02 - spacecraft gets hit by large obstruction
DamageHit_03 - spacecraft gets hit during roll
DamageHit_04 - spacecraft gets hit during pitch
DamageHit_05 - spacecraft gets hit during boost

Design Questions

What is the naming convention for audio files?

What goes on the Leaderboard? Response time? Play duration?

-Number of bosses defeated as technically enemies and levels are irrelevant I would imagine ? If you end each level on a boss fight then it is mainly what level/boss they got up to?

We could count the enemies and just show it on the leader board the highest boss kills + other enemies just so people feel like there is more reason to keep going despite it being somewhat controlled by us?

What about a score? something simple like this for each enemy killed:

$(\text{base_enemy_value} \times (1 / \text{reaction_time_value}))$

- **base_enemy_value = max score value of enemy**
- **reaction_time_value = [1,2,3,4,5] where the index is increased by multiples of some base reaction time**
 - **CLAMP(floor((reaction time in ms) / 100 ms) + 1, 1, 5)**
 - **Could be more complex if linear doesn't seem right**

So the quicker you react, the greater the score. Then the leaderboard is just your score.

CLIFF NOTES::

-START OF GAME/// LEVEL TRANSITIONS WHEN BEATING BOSSES TO NEW LEVELS:

- 1-Blast shield comes down/scrolls up**
- 2-show tactical hud of averages per level,world average bellow that**
- 3-Jump into hyper space after hud scrolls up load next level.**

-LEADERBOARDS:

-shows how many worlds they have played through in a 3 World bracket system
worlds 1-10
worlds 11-20
worlds 21-30

Comment [5]: Should it also have a multiplier for consecutive kills/successes?

This will show the average response time per World vs per level, this will also stack with Stars next to each world as they go through the next play through.

Example Leaderboard:

worlds 1-10 - RT- .06 secs ***

worlds 11-20 - RT- .03 secs **

worlds 21-30 - RT- .2 secs *

-LEVELS:

-3 worlds will be made 10 levels per world, 30 levels total in the entire game. The game will scale on difficulty after defeating all 30 levels and going back to world 1. This will be shown on the leaderboard Via Stars next to the world on average response time and stars next to each world

-Difficulty Curve

1- Enemies come towards you faster in later levels and response time is shorter to react to it.

2-Bosses gain more hits on later levels, start on 3 hits in worlds 1-10, 4 hits on worlds 11-20 5 hits on worlds 21-30 , 6 hits on worlds 1-10 (star 1/playthrough #2) Stop limit at 7 total.

-GAMEPLAY/USER FEEDBACK

-Color Code enemies and have proper indicator showcase what needs to be clicked when closer to vehicle , early levels treat this as a mini tutorial.

-Enemies will have a slight color outline around them when they get closer to your hud/screen to signify what to counter with as above.

-Class Types

<u>ENEMY:</u>		<u>PLAYER:</u>
SHOOTING	=	SHIELDS
ROTATING OBJECTS	=	PROJECTILE
MASSIVE OBJECTS	=	NET

-Tech Art

-entire path /level is a spline in a torus/doughnut shape

-there will be 3 main worlds that will have modular trigger points on the spline they call from for stars/nebulas/planets etc.

-hud will have special intros for boss fights that will have camera zoom in on left/right and then center out when a boss appears.

UI IDEAS:

BLAST SHIELDS COME DOWN, SCI FI HUD POPS UP.

1- MAIN MENU, PRE GAME START MENU

2- END OF STAGE SUMMARY

3- ADS EVERY FEW LEVELS AFTER END OF STAGE SUMMARY (Once every 2-3 levels?)

Can We achieve these effects on a handheld device?

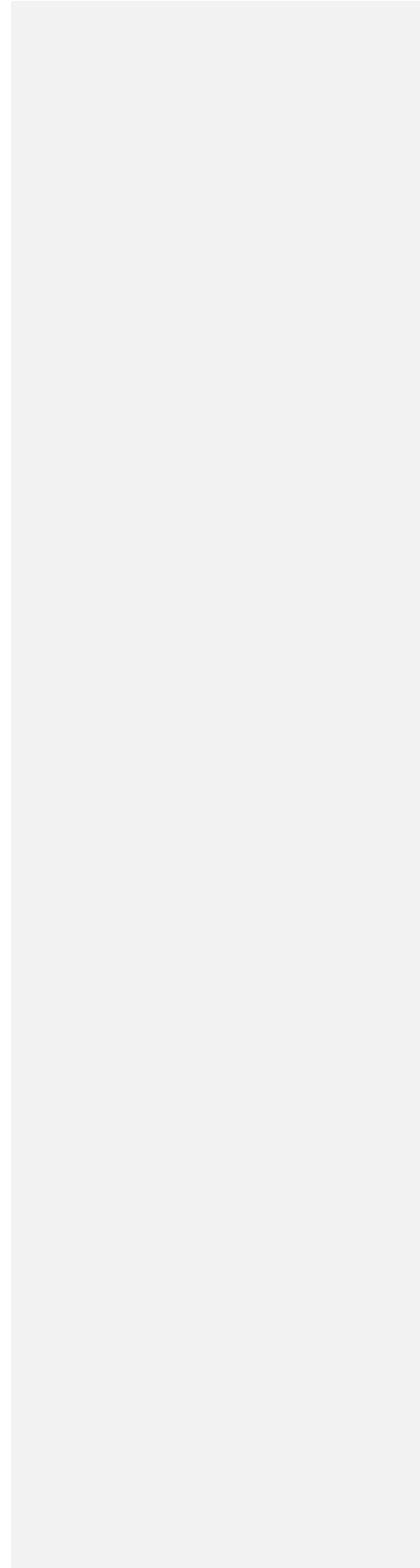
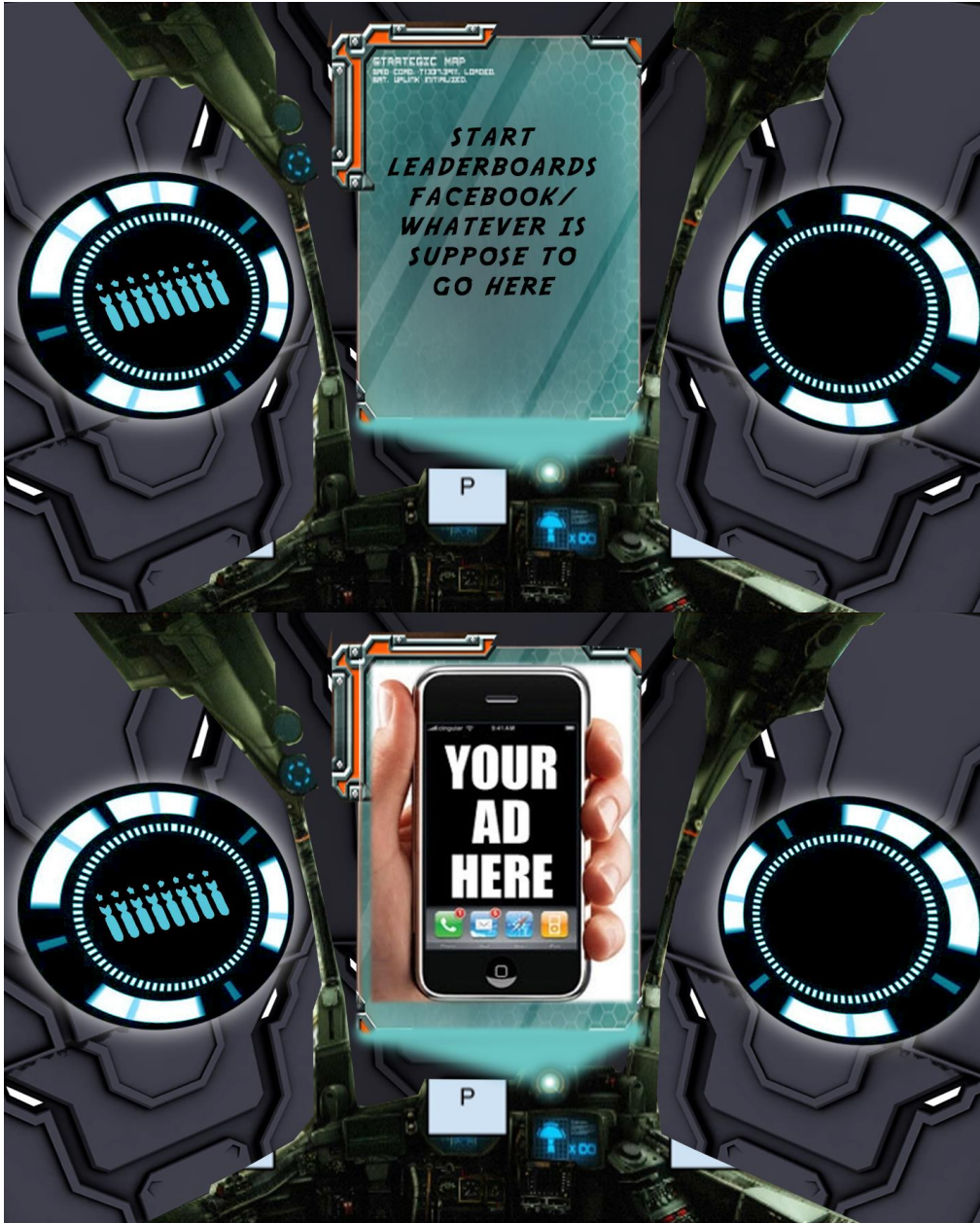
<https://www.youtube.com/watch?v=sYs1IG6TfHs>

<https://www.youtube.com/watch?v=1y4R0lw6x5M>

https://www.youtube.com/watch?v=Xdv0v_of1tg

*after watching the video, I can safely say this can be done, but with some modifications on our end. Mainly the BIG image (the one mapped on the curved plane in the back) would need to be our space dome /black/orange/whatever color nebula we make. The planes would be a volume trigger placed and moved around the ship as it passes while the starts would always be attached to the ship to create that sense of movement easily while on the spline. So the planes + emitter is 100% how we would handle this easily. To make it feel better we would make more triggers/nebulas etc via 3d + planes , so set 1 on trigger spline can be nebulas #2 = space debris #3 = nebula variant, etc.

I'll make a mock up 2D example to explain better later.





Audio examples:

(As Sean requested, dropping links to ideas/audio examples to think of for this game)

https://www.youtube.com/watch?feature=player_detailpage&v=kIxKimrCrS4

<https://www.youtube.com/watch?v=yuPxA24j70E>

^Big inspiration for gameplay and audio for boss fights as well! More in game cinematics without a story being told/shown.