



Game design document

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```
internal void ChangeColorForExplosion(Color32 color, params MeshRenderer[] borders)
{
    for (int k = 0; k < borders.Length; k++)
    {
        borders[k].material.color = color;
    }
}
```

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Overview

Introduction

Exploit robots in this explosive simulation to score more points than your opponent in a specific time limit. Take advantage of the dynamic field and random abilities to get in your opponents' way, but weigh the choice between dodging the energy sphere and hitting it, you'll never know when it might explode!

Description

Ka-Poong! aim to reintroduce the historic game that marked the beginning of an era: 1971's Pong. An attempt is made to present an updated version in order to breathe new life into a classic, keeping the basic mechanics with innovative elements. The *2D arcade* game is set in a space setting where players can control two robots in a risky match with an unstable energy sphere to accumulate as many points as possible in a time limit.

USPs

- ❖ *Unstable Warning:*

This mode will define when the energy ball becomes unstable. This will encourage players to play smart, trying to score as soon as possible. During this phase they will have to be careful about either dodging or hitting the ball.

- ❖ *Random Skills:*

Players will have a skill randomly chosen by the game between seven different possibilities, which can only be used once per round. When used, the skill will be activated after the ball touches the players' pad and will affect either the player or his opponent. Once the skill has been activated, the player's pad who used it will change color to let the opponent know what to expect.

- ❖ *Dynamic Field:*

On the horizontal edges there will be wormholes that will teleport the ball from one to other while maintaining its trajectory. These will move horizontally in a specular way within a certain range, never reaching the corners.

The goals will occupy a section of the vertical edges of the field, so that players can safely dodge the ball whenever necessary.

Gameplay & Mechanics

Timer & Score

Before starting to play and after each point, the game will ask players to press any key to throw the ball into the field. The warning will appear instead of the timer at the top center of the screen.

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The game will last for 3 minutes and will be divided into rounds. Each time a player earns a point, a new round will begin. At the beginning of the new round skills, pads and the ball will be reset.

To acquire points, players must send the ball inside the opponent's goal. Should the "Unstable Warning" mode begin, they will also be able to gain a point if the ball explodes against the opponent's pad.

The moment the timer drops to zero, the game is concluded and the player who has scored more points will be declared winner. Should the players reach the same score, the game will end in a tie.

Once the game has ended, players will have the following options:

- ❖ Rematch
- ❖ Quit

Pause menu

In the pause menu in addition to the Resume and Quit buttons, there will also be a proper description of the skills with the name and how they work in brief.

Upon exiting the pause menu, a countdown of 3 seconds will indicate when the game will resume.

Field

The game window will be almost entirely occupied by the field during the game phase, leaving space in the lower and upper sides for the HUD.

A vertically dashed line will separate the two players' halves of the field. Both halves will contain: a goal, a pad, and a wormhole. Between the halves of the field, the ball will move freely.

Transform Upper Wall	X	Y	Z	Transform Lower Wall	X	Y	Z
<i>Position</i>	0	12.75	0	<i>Position</i>	0	-3.75	0
<i>Rotation</i>	0	0	0	<i>Rotation</i>	0	0	0
<i>Scale</i>	41	0.5	0.9	<i>Scale</i>	41	0.5	0.9

Goals

The goals will occupy a section of the vertical edges of the field, leaving corners where the ball will be free to bounce, giving the player a chance to dodge, but also the risk of making an auto goal.

Transform Player 1 Goal	X	Y	Z	Transform Player 2 Goal	X	Y	Z
<i>Position</i>	-20.75	5	0	<i>Position</i>	20.75	5	0
<i>Rotation</i>	0	0	0	<i>Rotation</i>	0	0	0
<i>Scale</i>	0.5	7	1	<i>Scale</i>	0.5	7	1

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Portals

There are two wormholes located on the upper and lower side of the field.

These will move horizontally in a specular way within a certain range, never reaching the corners.

The ball when it enters in the wormhole will exit from the other one with the same direction it entered.

	Upper Wormhole	Lower Wormhole
<i>Movement Speed:</i>	10	-10
<i>Left Limit</i>	-10	-10
<i>Right Limit</i>	10	10

Transform Upper Wormhole	X	Y	Z	Transform Lower Wormhole	X	Y	Z
<i>Position</i>	0	12.75	0	<i>Position</i>	0	-3.75	0
<i>Rotation</i>	0	0	0	<i>Rotation</i>	0	0	0
<i>Scale</i>	3	0.5	1	<i>Scale</i>	3	0.5	1

Ball

The ball represents the energy sphere that the two competing robots will have to send inside the opponent's goal. This will be represented inside the game by a cube.

The ball at the beginning of the game, as well as each new round, will be placed in the exact center of the field and will be thrown in a random direction within it.

The movement of the ball, when it makes contact with a pad or wall, will never be interrupted. It will bounce until it enters a goal (or explodes during the "unstable warning" phase).

The angle of the bounce of the ball as it touches the pad will differ depending on where it makes contact with the pad:

- ❖ If the ball touches the center of the pad, the angle will be more sharp.
- ❖ If the ball touches the ends of the pad, the angle will be more blunt.

The ball's contact with walls and edges of the pad will not specifically go to affect the angle of the rebound.

Movement speed: 25

Transform	X	Y	Z
<i>Position</i>	0	5	0

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<i>Rotation</i>	0	0	0
<i>Scale</i>	0.5	0.5	0.1

Pads

The pads represent the robots and will be controlled by the respective players. These will be represented in the game by rectangles. The left pad will be controlled by Player 1, while the right pad will be controlled by Player 2.

Players will only be able to move the pad within the edges of the field and only on the Y axis. The position on the X and Z axis will be kept fixed. In order to give the player more room for movement and to dodge the ball when necessary.

Movement speed: 14

Angle Regulation	From	To
<i>Sector 1</i>	0	50
<i>Sector 2</i>	130	230
<i>Sector 3</i>	310	360

Transform Player 1	X	Y	Z	Transform Player 2	X	Y	Z
<i>Position</i>	-17	5	0	<i>Position</i>	17	5	0
<i>Rotation</i>	0	0	0	<i>Rotation</i>	0	0	0
<i>Scale</i>	0.5	3.5	0.1	<i>Scale</i>	0.5	3.5	0.1

Skills

At the beginning of the game, each player will be assigned a skill randomly chosen by the system from those available. Players will have the opportunity to use them only once per round, thus encouraging the use of strategy.

Once the player presses the assigned key, the player's pad who used it will change color and the skill will be activated only after the ball makes contact with their pad, leaving the possibility to the opponent to react.

The name of the skill, after the end of the effect, will change to warn that the skill is no longer available.

Once the round is over, new skills will be assigned, along with the ability to reuse them for that single round.

A proper description of each skill will be present in the "Pause" menu.

To infinity and beyond

The ball will increase its speed to 40.

The ball will return to its normal speed after 1 touch with any pad.

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You shall not pass

The goal of the player who activated this skill will be obstructed by a small bar.

The bar will be destroyed by the ball after a single touch, otherwise it will vanish after 10 seconds.

I'm confused

The opponent's controls for their own pad are inverted.

Duration: 10 seconds.

Reverse transformation

The player loses control of his pad and gains control over his goal. While this skill is active, the opponent won't be able to activate any of his skills.

Duration: 10 seconds.

Avant-garde!

The opponent's pad is moved forward from its proper position.

Duration: 10 seconds.

Movement position value: 3.5.

I am speed! Or not?

The opponent's pad control speed is changed. It will be chosen randomly whether the speed will increase to 30 or decrease to 5.

Duration: 10 seconds.

Alexa, disable portals

Wormholes disappear temporarily.

Duration: 10 seconds.

Unstable Warning

The *Unstable Warning* mode will define the moment in the game when the energy ball becomes unstable. This will encourage players to play smart, trying to score as soon as possible. The moment it starts, they will have to be careful about their choices.

This mode will activate every round if players fail to complete it within 20 seconds. In the event that they should score, and thus finish a round, the timer of the alert mode will reset.

Players will be alerted by a dual signal: visual and audible. An alarm sound will be played, to establish the start of this phase. In addition, the walls will change color and the ball will begin to flash to represent the possibility of explosion.

The probability of the ball exploding will be 20%.

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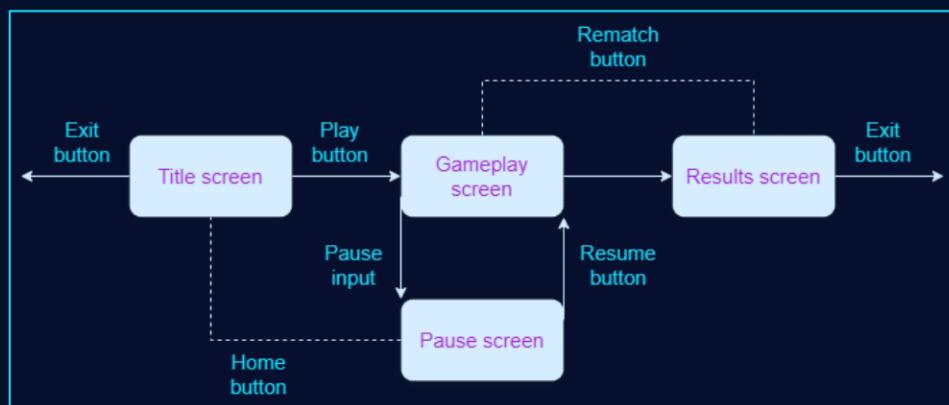
The explosion will occur only upon contact with the pad. If the ball should explode, a point will be given to the opponent. a short animation will be played that will split the ball into four smaller squares that will be thrown around the map. The pad that suffers the explosion will vanish.

Controls

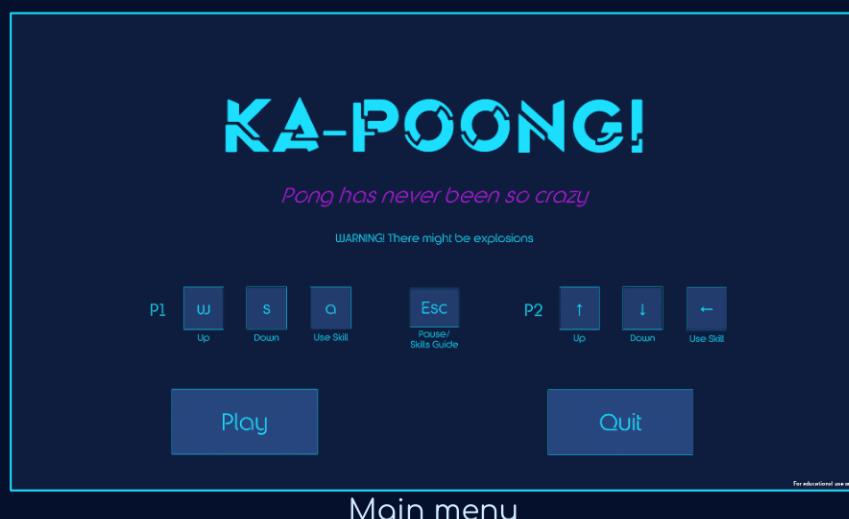
	Player 1	Player 2
Pad movement up	W	Up key
Pad movement down	S	Down key
Skill activation	A	Left key
Pause/Resume	Esc	Esc

UI/UX

Flowchart



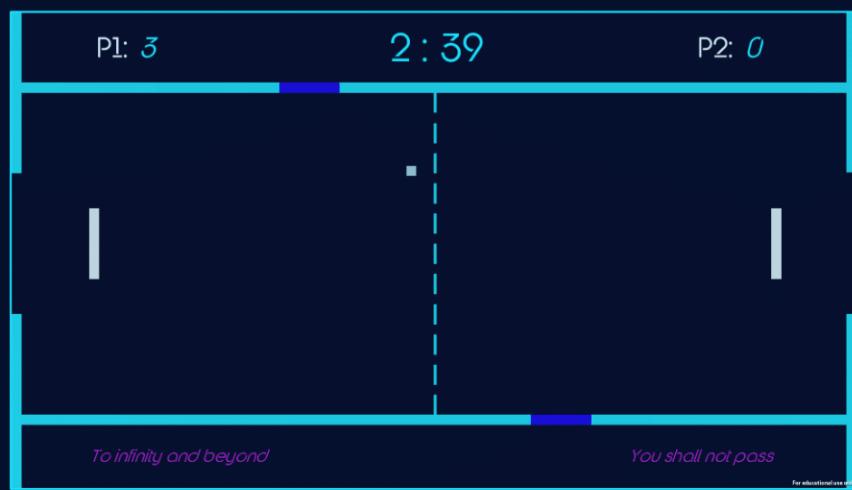
Mock Up Screens



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Gameplay introduction

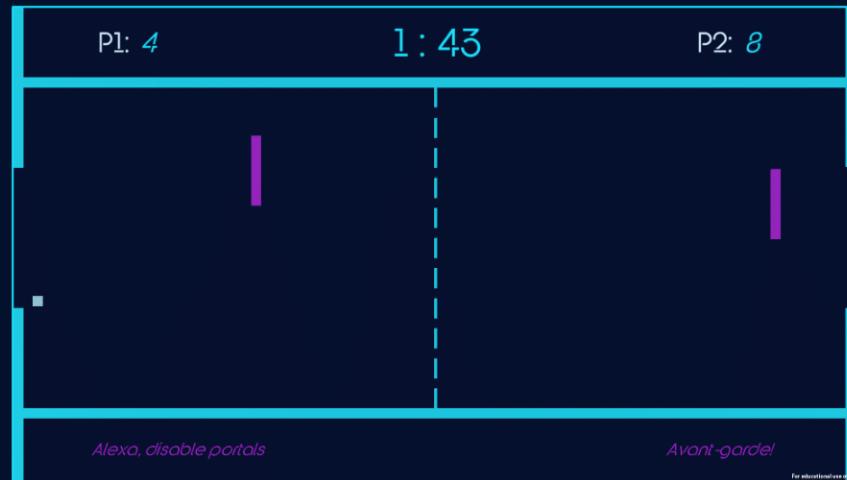


Gameplay screen

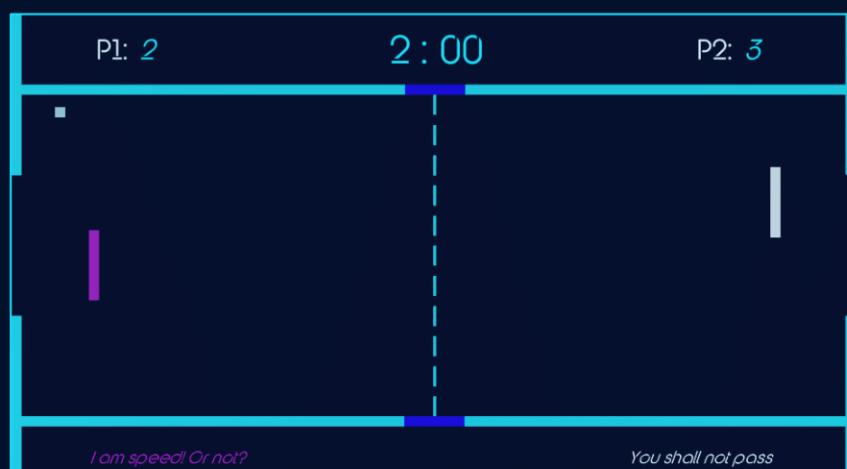


Pause screen

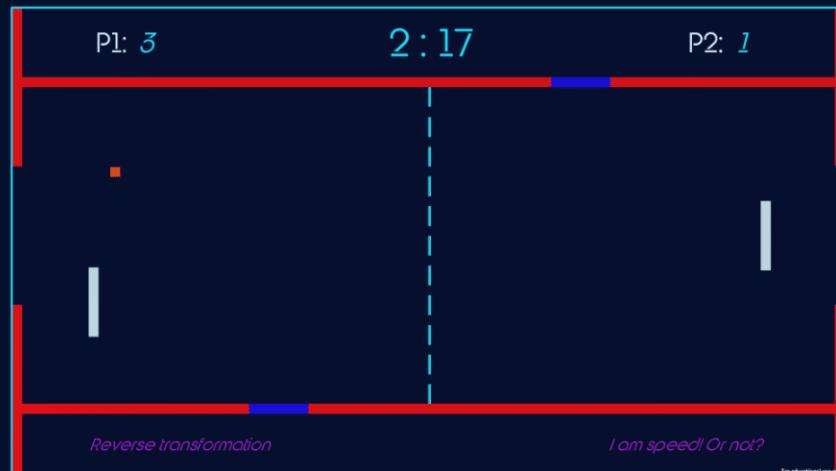
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Ability usage

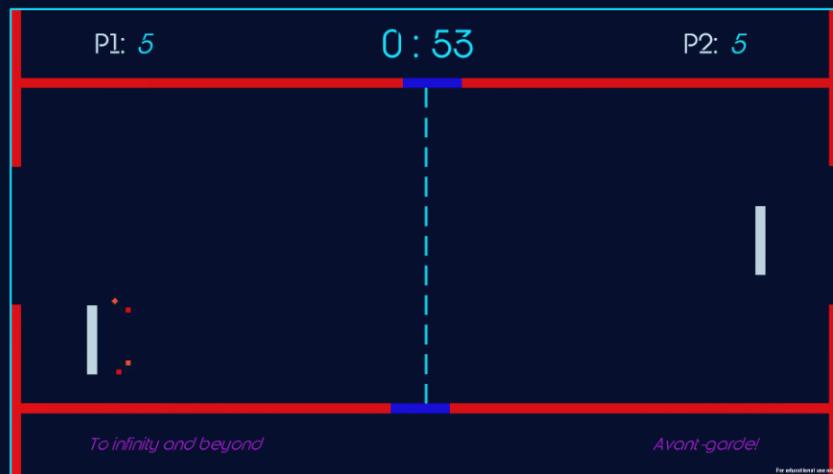


Ability used



"Unstable Warning" screen

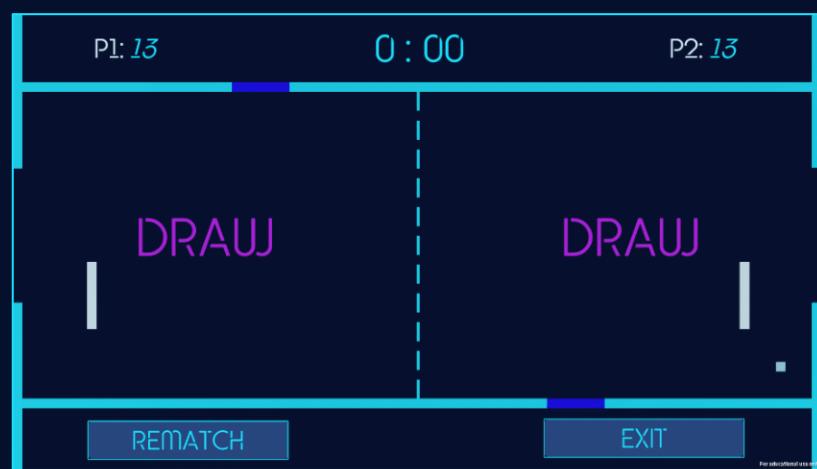
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Ball exploding



Victory screen



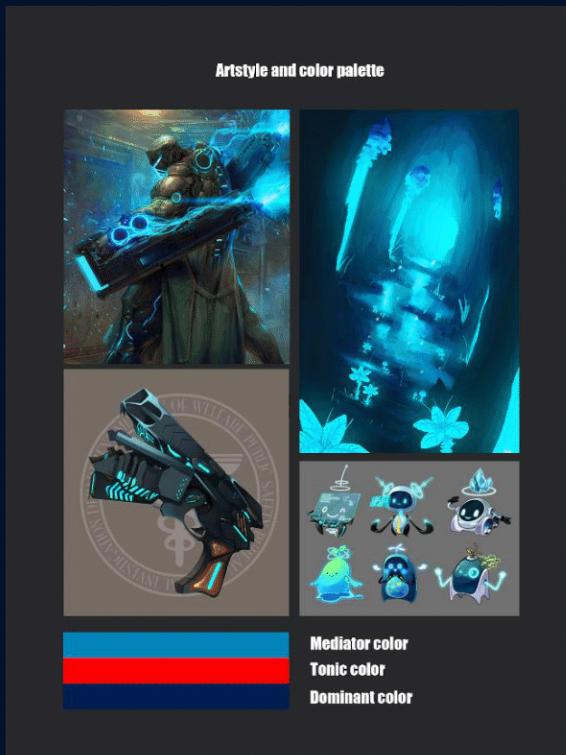
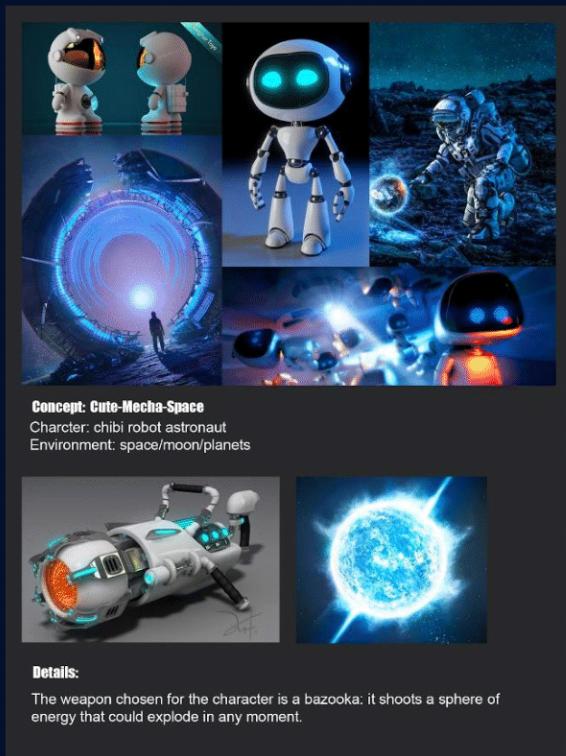
Draw screen

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Art

As the context in which the game is set is a challenge between two robots through the use of an unstable energy sphere in a space station, an attempt is made to adapt the art and make it coherent, mainly due to the difficulty represented by the arcade game genre with solid colors and almost no video effects.

References



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Colour Chart

Objects	RGB	HEX	Colour
<i>Game paused layer (Alpha 50)</i>	0, 0, 0	000000	
<i>Walls</i>	28, 223, 255	1CDFFF	
<i>Walls (Unstable Warning)</i>	244, 4, 10	F4040A	
<i>Wormholes</i>	23, 1, 247	1701F7	
<i>Background</i>	6, 17, 46	06112E	
<i>Buttons</i>	68, 114, 196	4472c4	
<i>Buttons (pressed)</i>	43,73,132	2B4984	
<i>Ball</i>	213, 238, 255	D5EEFF	
<i>Ball (Unstable Warning)</i>	255, 105, 31	FF691F	
<i>Ball (Unstable Warning- Flash)</i>	244, 4, 10	F4040A	
<i>Pad</i>	213, 238, 255	D5EEFF	
<i>Pad (Skill Activated)</i>	166, 36, 214	A624D6	
<i>"You shall not pass" barrier</i>	213, 238, 255	D5EEFF	

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Fonts

Three different fonts, matching the sci-fi and arcade style of the game, will be used for all text in the game. Each font will be used for different elements:

- ❖ *Kitami*: subtitle, skill names, skill descriptions within the pause menu, timer, scores, texts within the buttons of the UI, results texts.
- ❖ *OriginTech*: title of the game.

Sound & Music

Audio effects will be critical where the art is most limited to clarify to players the context in which the game is set, always staying within the Arcade style.

To make the game more immersive, the following audio effects will be present:

- ❖ Ball collision with walls
- ❖ Ball collision with pads
- ❖ Ball explosion
- ❖ One point score
- ❖ Skill usage
- ❖ Pressing a key in the UI
- ❖ Pressing Start in the Main Menu
- ❖ Game Over
- ❖ Interaction with wormholes
- ❖ Alarm for “Unstable Warning” beginning

Music will be also featured in the background in the main menu to make the game more immersive and enjoyable.