



Split Dimension Jumpy-Ducky

Split screen single player game controlling two characters simultaneously

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You ran into a spatial anomaly while out on your morning jog. Unaware that anything has changed, you continue your jog but things are.... different...

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1 Overview

Split screen single player game controlling two characters (one on each half of the screen) running a gauntlet of obstacles to jump over or duck under, while also dodging left/right. Can you jump and duck before they collide with an obstacle and break both dimensions forever!?

1.1 Main Concept

This is a Vertical scrolling racing game.

The player controls a character who is just out for their morning jog.

The character must jump and duck around obstacles (a regular part of their morning jog), only today.., they run into a spatial anomaly by accident! This causes the character to become duplicated in a parallel dimension which the player is now also responsible for! If one dies, they both die, it's very dangerous!

The game is intended to be re-playable, and has opportunities to introduce extra game modes and more difficult mechanics to enhance re-playability.

1.2 Unique Selling Point

The player will be engaged in ensuring both characters jump, dodge and duck as they encounter obstacles. Navigating through the levels to find the exit anomaly at the end of the level and exit to the next level. The uniqueness is derived from the dual character instances which the player is controlling simultaneously.

This presents the player with a multitasking challenge as the two dimensions are not in sync, with each character having to avoid obstacles at different intervals.

2 Research

2.1 Similar Game References:

SDJD is inspired from a few different games as described here. While it takes elements from each of these games it is not an exact replica, rather a hybrid of some different approaches to the arcade scrolling game archetype.

2.1.1 Google Dinosaur Offline Browser Game:

Googles dinosaur game is a similar game in which the player plays a dinosaur character and must navigate an endless array of obstacles, jumping and ducking as the proceed. Colliding with any obstacle ends the game and awards the player with a score. There is a single instance of a character in Google's game, which differs from this game where there will be two instances of the character which the player must control simultaneously.

2.1.2 Twisted System (2002):

Twisted System is another inspiration for SDJD as it incorporates a challenge mode game of jumping and ducking around obstacles as the character runs along a rotating platform. SDJD will be a single player experience incorporating the jumping and ducking elements from Twisted System however it will not be multiplayer.

2.1.3 Pole Position (1982):

Pole position is an arcade style vertical racing game, with the player racing against AI to get the best racing time. The player has to dodge left/right to avoid npc/AI players. SDJD will incorporate the vertical scrolling implementation of Pole Position while also having the dodge left/right mechanics.



Figure 2.1: Google Dinosaur, Twisted System, Pole-Position

2.2 Other Genres

2.2.1 Shooter:

Games Researched:

Neon Chrome, Hotline Miami, Ailment.

Each of the above offers an immersive experience, collecting weapons, shooting enemies, different types of weapons excel at destroying certain types of enemies.

Clever level design requiring the player to unlock doors with hidden keys they have found, some of which are dropped by tougher 'keyholder' enemies.

Character upgrading, which involves spending in-game currency or accrued experience points to unlock extra in-game abilities or weaponry.

As the player advances through the levels they are increasingly challenged with tougher enemies, harder to navigate levels and Boss levels. While also having to contend with different combinations of enemy groupings to provide a consistent challenge through the game and force the player to come up with new strategies to complete the level.

This means that players with an interest in shooting games can pick up and play, and quickly become invested in the game, while also providing newcomers to the genre with an appropriate learning curve that doesn't immediately overwhelm them.



Figure 2.2: Neon Chrome, Hotline Miami, Ailment

2.2.2 Board Game:

Games Researched:

Chess, Go, Snakes and Ladders.

Given the classic nature of these board games, each of which is available for mobile, it is clear to see the attraction to players.

For both Chess and Go, these games are challenging the player's logic and strategy. The games are turn based which allows the player time to consider their next move, before placing or moving any pieces. Snakes and Ladders is a dice rolling game and is based more on luck than logic, and provides a different experience than the former games. While Chess and Go challenge the players to think ahead with careful strategy, to outwit their opponent and conquer the board, Snakes and Ladders allows players to roll dice and they may be lucky to land on a ladder (advancing rapidly through the game board), or unlucky to land on a snake which has the opposite effect to the ladder.

Chess and Go have a learning curve however and require the player to learn where a piece can move (Chess), or how to escape capture (Go). Both games are rewarding in the long term and the skill ceiling is very high when it comes to any professional level.

Alternatively, Snakes and Ladders can be played by players of almost any age, the rules are easy to learn and remember. The emphasis is more on fun than strategy. Chess and Snakes and Ladders have spin-off games which take the common understanding of the original game and change the rules to offer a different player experience, altering the game play, but keeping the original concept intact.



Figure 2.3: Chess, Go, Snakes and Ladders.

2.2.3 Platformer:

Games Researched:

Super Meat Boy, Dead Cells, Prince of Persia.

As the genre suggests, each of the above games include platforms as a means of navigating the game world. In Super Meat Boy traveling between the platforms is perilous as you try to avoid spikes and spinning blades. Dead Cells has you exploring dungeons, sewers and graveyards while fighting off dangerous enemies with medieval weaponry. Prince of Persia takes you on an adventure through catacombs littered with traps, pits, secret pathways in which you must climb, dodge, jump and swing your way around.

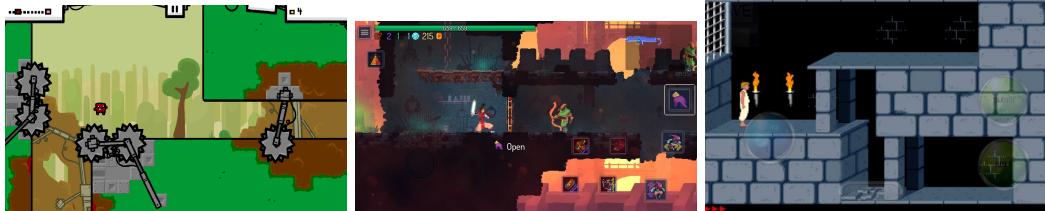


Figure 2.4: Super Meat Boy, Dead Cells, Prince of Persia

2.2.4 Conclusions

Each of the genres above, and all of the games mentioned, appeal to players sense of fun in different ways.

[8 Types of Fun in Games](#) (also referenced in 3.4 Player Engagement), describes a study of games design with regards to game enjoyment and fun. This list was composed by [Mark LeBlank](#), senior Research and Development Director at [Riot Games](#).

I have chosen the scrolling platformer genre as it's what appeals to my sense of fun and challenge. I like that it works well on a mobile platform, it's accessible to a wide range of players (old and new), and can be easily understood while also providing a challenge to your attention and reactions.

3 Specification

3.1 Player(s) / Target-group

The game targets fans of old school arcade games like Mario, Donkey Kong, Pole Position, Asteroids and many more. The art style of the game will follow the old 8/16 bit style, pixel art, and sound board to match the style.

3.2 Genre

Vertical/Horizontal scrolling racing game.

3.3 Art Style

The art is 80's retro neon themed, colorful, pixels, 8/16 bit scheme.

3.4 Player Engagement

Considering fun in games is important to keep the player interested, invested and immersed in your game.

[8 Types of Fun in Games](#) is an excellent resource in this regard and has helped identify what types of fun the game is intended to deliver to the player. This was discussed earlier in the document also, in regards to other genres and the choice to design a platformer.

SDJD will incorporate 3 key points from this article:

3.4.1 Sensation

Game as sense-pleasure.

The player will get a sense of fulfillment and enjoyment from learning the game mechanics during the early stages and then being put through their paces as the game progresses.

3.4.2 Challenge

Game as obstacle course.

Challenge will be core to the game feel and design. There is a lot of pressure on the player to multitask and pay attention to both game characters, challenging the players ability and response times to avoid all the obstacles.

3.4.3 Discovery

Game as uncharted territory

Depending on development time and scope creep, this may also contribute to the game. The developer will have the option to invest in a procedurally generated level mechanic, which increases in difficulty as the player progresses through the game. With options for introducing more difficult obstacles in more advanced stages/levels.

4 Gameplay and Game Setting

4.1 Core Game Features

4.1.1 Tutorial Dimension.

The character starts centred on screen, running vertically. Positioned at the bottom of the screen and running up towards the top. The road or track the character is running on can be split into 3 lanes (left, middle, right), so that the default player start position is middle. If the left arrow is pressed, the character moves into the left lane. If the right arrow is now pressed, the player moves back to the middle lane, such that an arrow press changes the lane the character is running in by one.

There are obstacles to avoid (obstacle assets to be delivered during development but 'blocks' will be a placeholder), blocks can be placed on the left, centre or right of the road, the player will dodge these by moving the character left or right using the left/right arrow buttons.

Other than the dodge obstacles there are jump blocks which cross the entire road and must be leaped over by pressing the (J)ump button, as well as low hanging road signs which the player must duck under by pressing the (D)uck button, all whilst running.

The Game begins in single dimension mode, as a means to teach the player the controls in a friendly, stress-free environment. In the tutorial there will be an easy sequence of dodge, jump and duck obstacles, with floating text on the road ahead to inform the player what actions to perform to avoid the obstacles, placed conveniently before the player encounters each obstacle. As the player continues through the tutorial level there are further obstacles to fine-tune their newly acquired skills, finally ending with the character encountering a spatial anomaly, and running into it for some reason.

End of tutorial, splash-screen transition to first level, with information explaining what's happening in the game to the player.

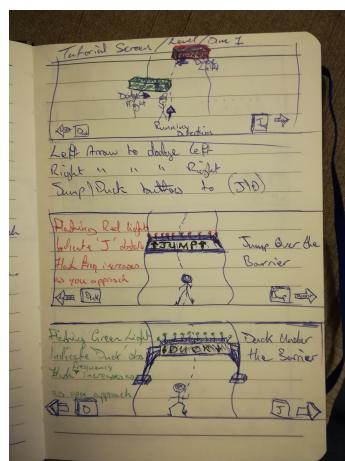


Figure 4.1: Tutorial Level Sample

4.1.2 Split Dimension(s).

Now the dimension is split, the player is presented with two instances of the character, side by side. This level begins with both instances of the player encountering the same obstacles at the same time (in sync) and ends with the obstacles becoming more out of sync. As the player progresses through subsequent levels the obstacles become more desynchronized, and more random. At higher levels the speed at which the characters are running also increased to really challenge the player.

Each level ends (and the next one begins) when the player successfully guides the characters through the spatial anomaly.

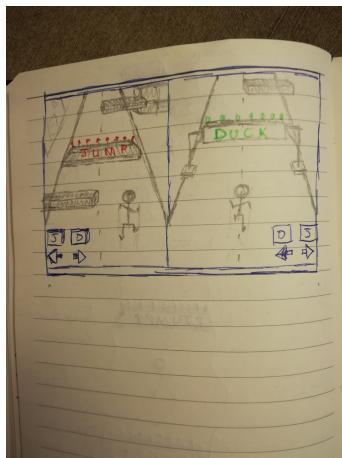


Figure 4.2: Split Dimension Level

4.2 Story

The yet to be named character (developer discretion) is out for an every-morning, normal, jog.. Which usually routes through an area with obstacles to dodge or avoid by jumping/ducking.

Today is like every other day, except today the character runs into a spatial anomaly!! The dimension duplicates itself creating an 'almost mirror' dimension..

While the character is completely oblivious to any changes, there is now another instance of themselves, running alongside in the other dimension. Their lives are dependant on each other! If one crashes the other also suffers, and can even die, it's very serious..

Little do the game characters know that you, the player has their best interests in mind, and you will guide them through the treacherous Split Dimension Jumpy-Ducky!

4.3 World/Environment

80's Futuristic Neon Chrome influenced environment.

4.4 Objects in the Game

All assets are yet to be developed. Obstacles:

Road blocks (full and partial).

Road Signs (full and partial).

Pickups:

Health (some kind of shiny future energy bar)

Get out of 'Split Dimension Hell' Free card (collect enough of these items to allow an instant resurrect if you run out of health), empties after use and can be refilled.

4.5 Characters in the Game

The character assets are stick men (animations will be provided), capable of running, jumping and ducking.

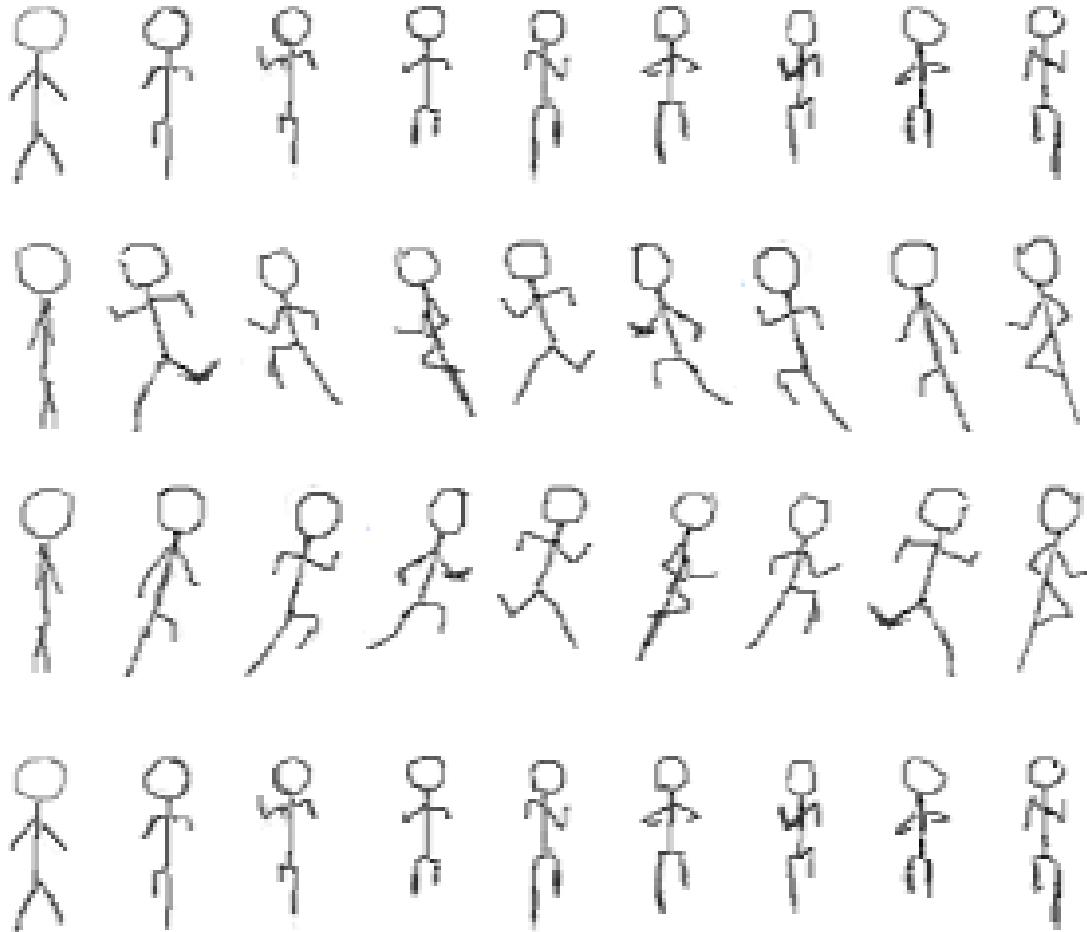


Figure 4.3: This example is taken from Google

4.6 Main Objective

Main objective of the game.

The world is split in two, the objective is to successfully assist each character to navigate through the levels without dieing, so they can merge together by at the end level and go back to their daily lives still oblivious to their perilous encounter with Split Dimension Jumpy-Ducky.

4.7 Core Mechanics

The 'avoid' mechanics (jump, duck, dodge) are self explanatory, and at the developers discretion to decide how best to implement.

Colliding with any of the obstacles will cause damage to the character. Be careful however as accidentally jumping into a road sign or ducking face first into a road barrier will cause even more damage..

Character health will also be at the discretion of the developer, and could be used to separate game difficulty levels. Here are my thoughts and ideas.

Separate health bars? If one characters health is full at the end of a level and the other's is almost empty, can you balance them out?

Shared health bar? Damaging either character will reduce their overall health! Also health collected is shared, and resurrect is shared..

After a collision the character is invincible for a short time
What happens if one character dies? the other also dies and restart level option or quit game alert pops up..

Insta-resurrect, if enough resurrect items are collected. They are consumed upon use and must be refilled, this mechanic can be used as a difficulty control, by limiting the amount of resurrect available in later levels and forcing the player to hoard them. Perhaps allow the player to hold more than one resurrect at a time? Or allow the player to 'spend' it on health..

4.8 Controls

There are left/right arrow buttons to move the player. Jump and Duck buttons will cause the character to reach accordingly. There is a pause button to pause the game and access the in-game options menu.

5 Front End

5.1 Start Screen

This asset is in development. It is an 80's neon cityscape in pixel art. The image included here is as a guide for theme and tone but is not the finished product.



Figure 5.1: Game Menus

5.2 Menus

High res Sketches will be provided with document.

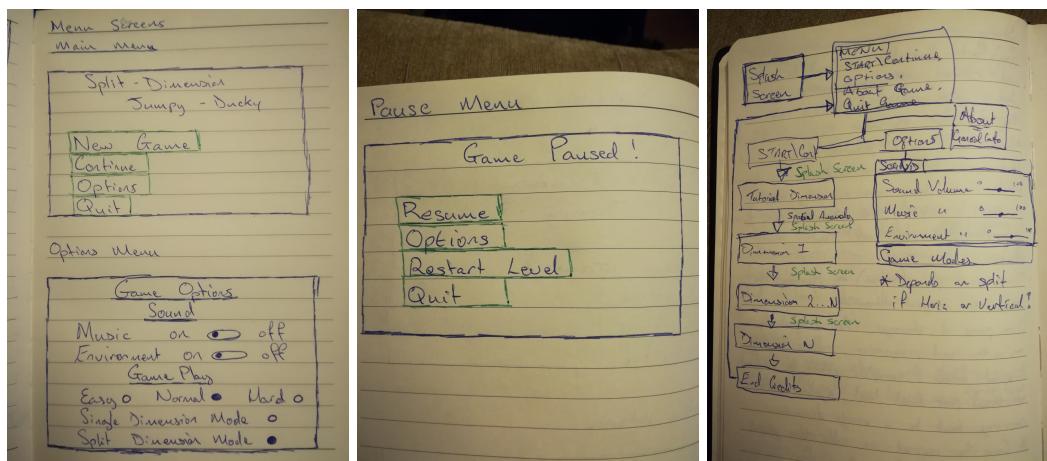


Figure 5.2: Game Menus

5.3 Credits Screen

TBD (Developer Discretion)

6 Technology

Developed with Unity3D Game engine. (Version 19.x.x.).

Gimp/Photoshop for concept art/sprite development.

Blender Studio for art/models.

Fruity Loops for sounds.

6.1 Target Systems

Target platform will be Android and also PC/iOS if the developer wishes.

6.2 Hardware

Developer discretion required.

Android implementation will require any mobile device running Android 8.0 or later.

7 Test Plan

Throughout the development process, visible errors will be fixed as they arise. However, slight errors in obstacle (or other entity) behavior can be overlooked while testing for overall functionality, and then after “playing a round” of the game, those behavioral errors can be tweaked until they are appropriate. Big errors that offer no immediate solution to the programmers will be documented for future solving and can be discussed during development meetings for potential solutions or workarounds.

Optional beta-testing period: Play the game and attempt to ‘break’ the game essentially, trying to do things that should not be possible in the game. EG. Attempt to run through obstacles or move outside the ‘track area’.. Tap or click within game area to ensure no false tap/click behaviours exist.

The software will be deemed good enough to deliver after it is noted that the character behavior is consistently appropriate each time the game is run for at least 5 test-runs of the game/rounds as well as having the behavior of all visual components (Panels, text boxes, etc.) involved with the Graphical User Interface (GUI) be consistently appropriate for all tests of the game.

7.1 TEST 1

7.1.1 Test Objective:

Test Menu buttons.

7.1.2 Test Description:

Select any menu buttons from start screen, pause screen, options screen.

7.1.3 Test Conditions:

Start Menu Buttons, Options Menu buttons, Pause Menu in game.

7.1.4 Expected Results:

Selecting Start Menu buttons will route player to Start/Continue game, Open the Options Menu, Exit the game.

Options Menu buttons will enable/disable music/sounds, Select game difficulty, choose to play split/single screen.

Pause Menu in game allows resume game, open options menu, restart current level, quit to main menu.

7.2 TEST 2

7.2.1 Test Objective:

Test Gameplay buttons.

7.2.2 Test Description:

Select in game buttons (Left/Right Arrows, Jump, Duck).

7.2.3 Test Conditions:

Gameplay movement buttons.

7.2.4 Expected Results:

Left/Right arrows move the character left/right (character remains in left/right running lane and does not automatically move back to centre). Jump/Duck cause character to jump/duck.

TBD:

Project Management:

Programming:

Art:

Design:

Additional Credits: