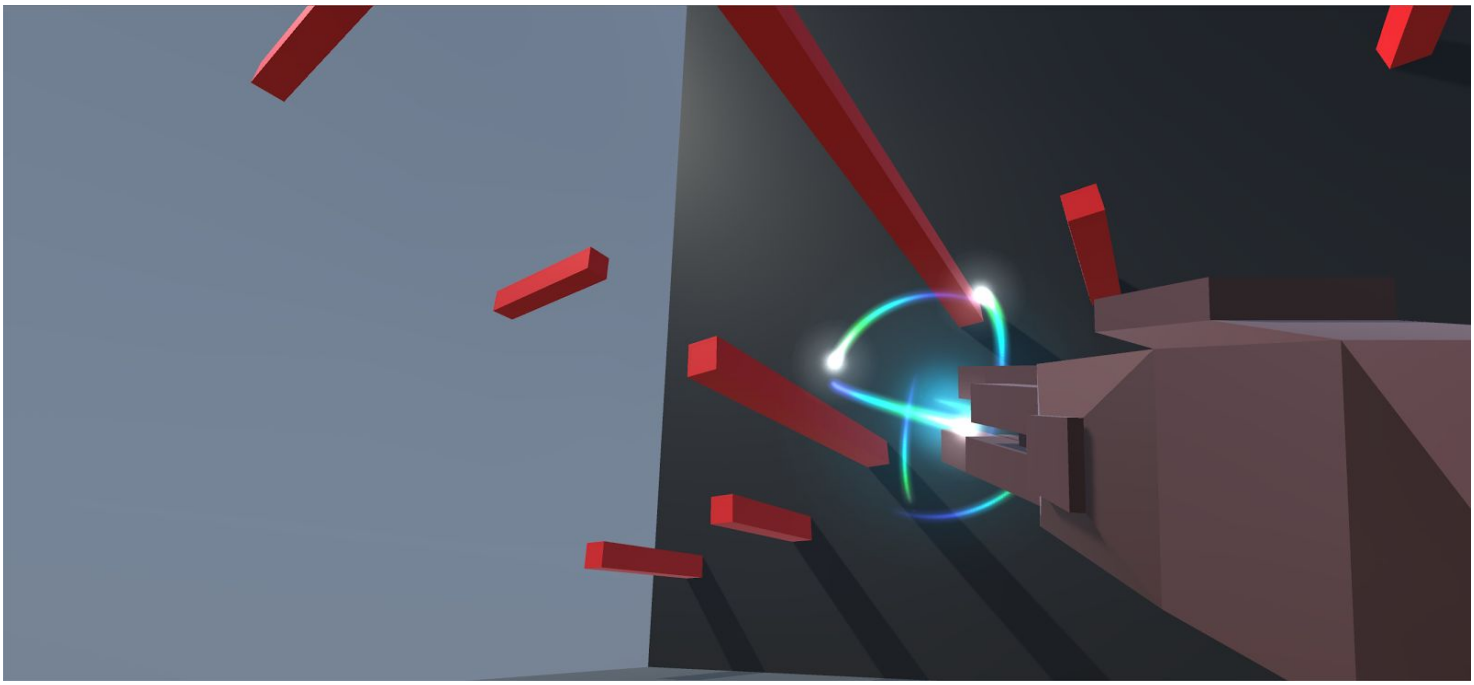
STATE CHANGE

Change The World Around You



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1. EXECUTIVE SUMMARY

State Change is a game where the player wakes up in a strange lab. They must escape this lab using only the MASS gun, which they find beside them and solve puzzles on the way. The player can defeat enemies and navigate through the lab by manipulating the environment.

2. OVERVIEW

Title
State Change

Genre
Action Adventure & Puzzle

Audience
Men and Women ages 13 and up; sci-fi fans

Plot
Waking up in a mysterious scientific facility with deadly security systems, you must escape this facility alive. With the MASS gun, the only weapon given, you will fight your enemies by manipulating the environment. Creating blocks on the wall, you will kill the enemies, and reach your final goal.

Game
The game's main mechanic is the MASS gun. This is the only weapon given to the player and they must use this to escape the science facility. Throughout the game, the player is given challenges (puzzles) as well as face with robot enemies. Other mechanics include Resource management with active manipulations, and puzzles using environmental manipulation.

To reach the goal, the player must use strategy, to solve puzzles as well as killing the enemies. Unlike other shooting games, State Change requires the player to manipulate the environment to destroy them. By shooting at the wall or the floor, the player will generate blocks. These blocks can be used to destroy the enemies, which will either terminate them at contact (as the block is being created), or will allow the player to move around the facility. As the game progresses, they will face new types of enemy robots that will require a different approach to surmount.

Puzzles found in this game vary between levels. Each level has a limit of blocks the player will be allowed at once. Also, the position/placement of the blocks can be changed since the player can add and remove the blocks.

Similar Games
State Change is based on two main games: *Portal* and *Fracture*.

Portal, created by Valve, has a major influence with the concept of using the portal gun through levels, as well as challenges. In *State Change*, the portal gun is replaced by the MASS gun. *Portal*'s main focus is on puzzles; however, in this game, the focus is more on

combat. Unlike other games, the gun is used to only manipulate the environment instead of directly shooting the enemies the player encounters.

State Change is also influenced by the game *Fracture*. It is a third-person shooter game created by LucasArts in 2008 and shares the concept of manipulating the environment. The setting in this game is different compared to *State Change*. With this said, the player in *Fracture* can only shoot the ground to raise it used this to navigate the enemies away from them. Since *State Change* is in a closed off environment, it allows the player to shoot the wall, as well as the floor to gain control over the enemies' movements.

One of the constraints put into *State Change*, is the limitation of blocks on each level. In *Fracture*, this concept does not exist since the environment can be changed at any point in time. This limitation allows the player to make strategic choices and makes the game interesting and challenging.

Another constraint is the player can not shoot the enemies directly. In all shooting games, the players are capable of the shooting the enemies directly, which is convention. With *State Change*, there was a different approach. By having this constraint, the player must strategically place the blocks in order to destroy the enemies.

3. RELATED GAMES

Game 1: Portal 2

Portal and *Portal 2* are both 3D first person puzzle games. They give the player a device called the portal gun and then present the player with dangerous challenges which can be traversed using the portal gun. *State Change* is similar in that it gives the player a scientific gun (MASS gun) which can be used to manipulate the environment and then presents the player with challenges to solve using the device. *State Change* focuses more on combat than puzzles and the state changer creates extrusions in the environment, whereas the portal gun creates portal which can be traveled between.

Game 2: Fracture

Fracture is a third-person shooter game. The player has weapons (guns and grenades), which allows them to raise or lower the terrain. The ability allows the player to create cover, jump to areas not normally reachable, and launch enemies into the air. The player must solve puzzles using terrain deformation. *State Change* is similar in that the player will solve puzzles, by manipulating the environment. *State Change* uses the gun in order to manipulate the environment, instead of using it as a weapon against robots. In State Change, our main weapon is the MASS gun.

Game 3: Half Life 2

Half Life and *Half Life 2* are both single-player first-person shooter games. The mechanics of these games include health-and-weapon systems and periodic physics puzzles. The player starts the games without any items, slowly building up a collection of items over the course of the game. *State Change* is similar in that solving physics puzzles is one of the main aspects of the game. The player will need to solve these in order to progress in the game and find the way out.

4. PLAYER COMPOSITES

Max Gibson is 21 years of age and is a university student at McGill. He plays games on a daily basis on his console which is plugged into a 50in 4K TV in his room, after his classes. He mostly plays action/stealth games like Assassin's Creed, Battlefield, Splinter cell... He mostly plays alone because the games he enjoys are mostly single player. He works part-time at Starbucks which allows him to have some income while he studies. Favorite TV shows are How It's Made and Simpsons. He also watches Hockey matches, religiously.

Aya Little is 15 years of age and is a highschool student. She plays games on weekends on her console which is located in the living room of her parents house. She mostly plays Adventures games like Portal 2, Mario Galaxy, The Last Of Us ... She mostly plays with her little sister and enjoys co-op games. Her parents buys games for her and therefore she requires their approval before playing any games. Favorite TV shows are Simpsons, Naruto and Friends. She plays tennis on weekly basis and enjoy watching national tournaments online.

Saud Mohammed is 35 years of age and works fulltime at a software company . He plays games during the week before going to bed and occasionally on weekends on his PC which is located in his room. He mostly plays FPS games like Call of Duty, Battlefield, Counter Strike ... He mostly plays alone and competes with his friends during the weekends. He has a huge collections of games and tends to try all the games the come out. His Favorite TV shows are Game Of Thrones, Dexter and Lost. He drives a Tesla Model X and enjoys Starbucks coffee.

5. WORLD

Unknown to the player, the game takes place in a scientific facility orbiting the earth. The facility is used to test strange and unusual things that are too potentially dangerous to keep on the planet. The facility is designed to be adaptable so that it can test any kind of strange artifact or creature that may be discovered.

The facility has been used to test numerous artifacts in the past such as a strange piece of metal found in an asteroid and a dangerous looking knife found in a pyramid. The MASS gun provides an interesting challenge as only one person seems to be able to get it to function, and they were more than reluctant to jump into the testing area. Fortunately, it's not hard to make someone's memory a bit fuzzy and to slide them onto the testing floor.

6. CHARACTERS

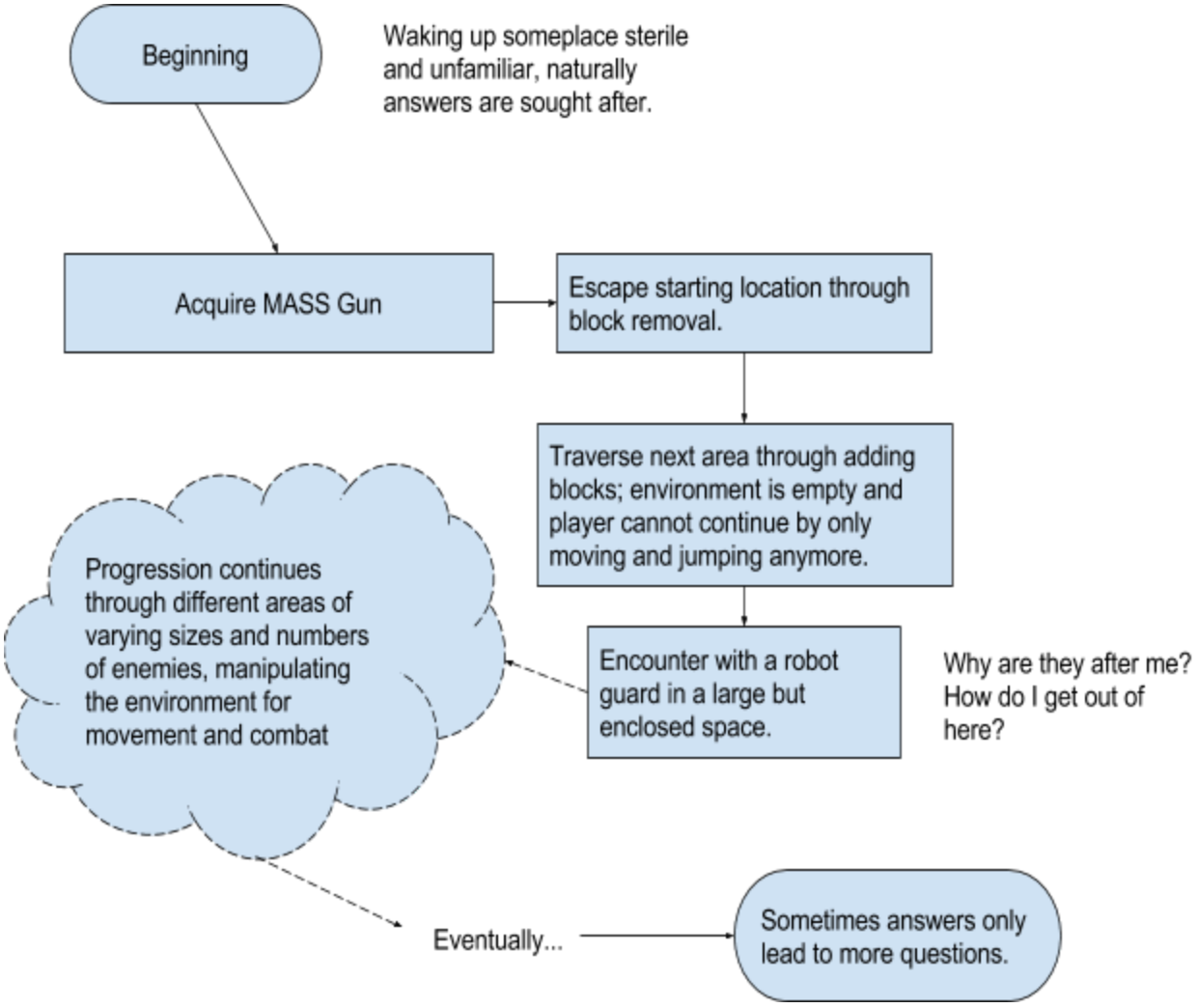
Main Character

Anderson White is a 25 years old male who had just started a career in aerospace engineering. As a child he always wished to travel to space and visit other planets. He graduated from Harvard university with distinction. He lives with his parents, two younger brothers and one younger sister. He watches Sci Fi movies every weekends and works on small personal projects in his free time. Now that he graduated, he got rid of his 15 years old car and got himself the car he always wanted, Tesla Model X. This is what he uses as his daily driver. He is known to always wear hoodies and a cap, even on hotter days. His favorite color is blue. Anderson is also a big rugby fan and practice the sport every week. In order to compete in the rigorous sport, he goes to gym almost daily.

Robots

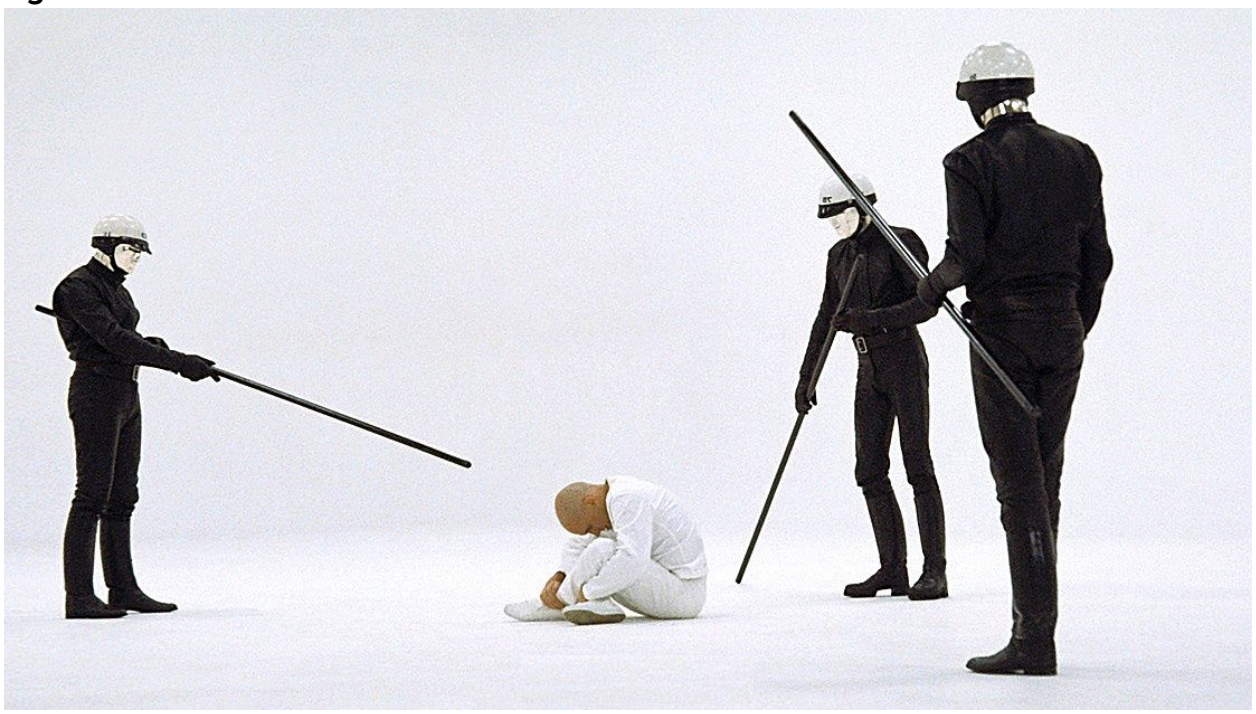
Created by the Nexus company who are the leaders in robotics and artificial intelligence. These robots are 6 feets tall and weigh about 200 pound. They can have normal and sound conversions with humans. These robots are the 25th generation made by the company and they have become very sophisticated over time. They are mostly made from steel alloy and aluminium. The older generation had robotics legs to move around however this was considered inefficient and therefore the current models hover in order move around. This allows the robots to move a lot faster and be more efficients in their everyday tasks. They are known to be very persistent and will do anything in order to complete a task given by their owner.

7. PROGRESSION CHART



8. ART DIRECTION

Figure 8.1 - THX 1138



THX 1138 conveys the artistic style of State Change. THX 1138 is used for the following:

- Art Direction (Colours - Monochrome, Style, Contrast)
- Story (Theme/Tone - Creepy/Edgy)
- Setting (Clean Future)

Figure 8.2 - Apple Store

The simplistic clean design of an Apple Store is used for the following:

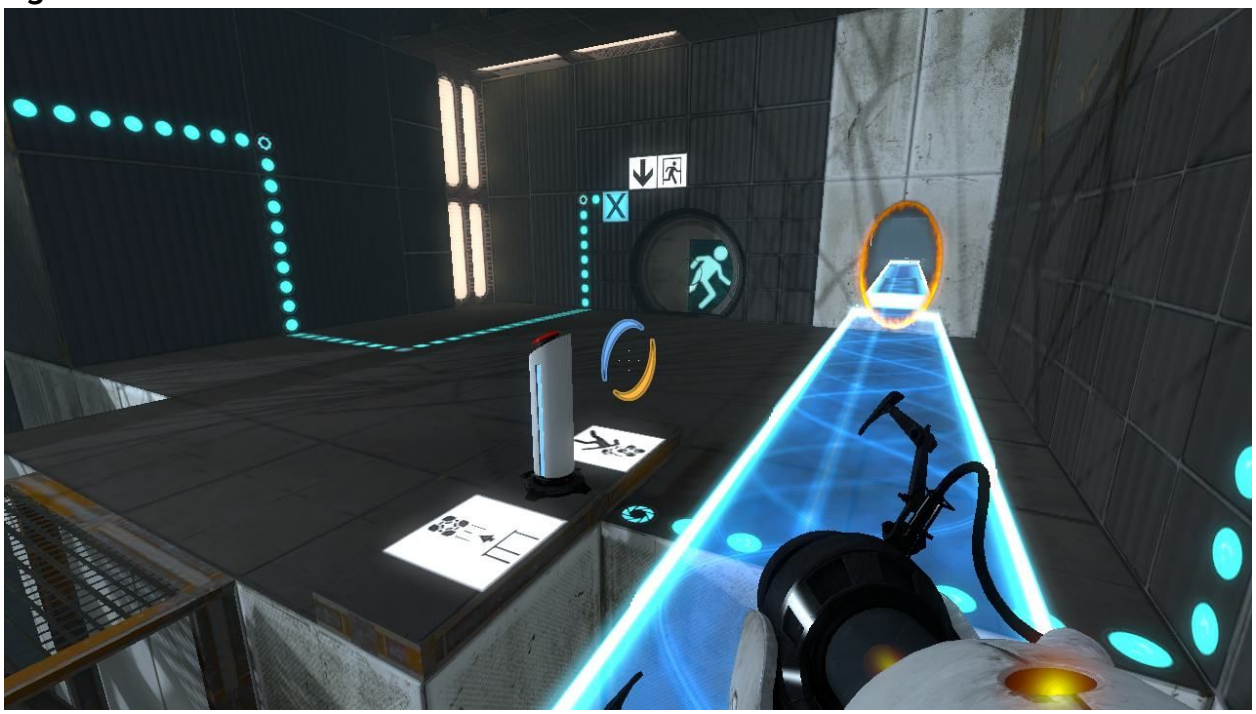
- Minimalism
- Clean and Sterile Environment
- Orthogonal and Crisp Design
- Apple Feeling (Gun, Shapes)

Figure 8.3 - Fracture

Fracture is used for the following:

- Matter Transformer
- Matter Puzzles

Figure 8.4 - Portal 2



Portal 2 is used for the following:

- Story (Theme/Tone - Escape)
- Setting (Lab)
- Puzzles

Figure 8.5 - The Jetsons

Rosie is a great example of the design for our semi-humanoid robots. The Jetsons is used for the following:

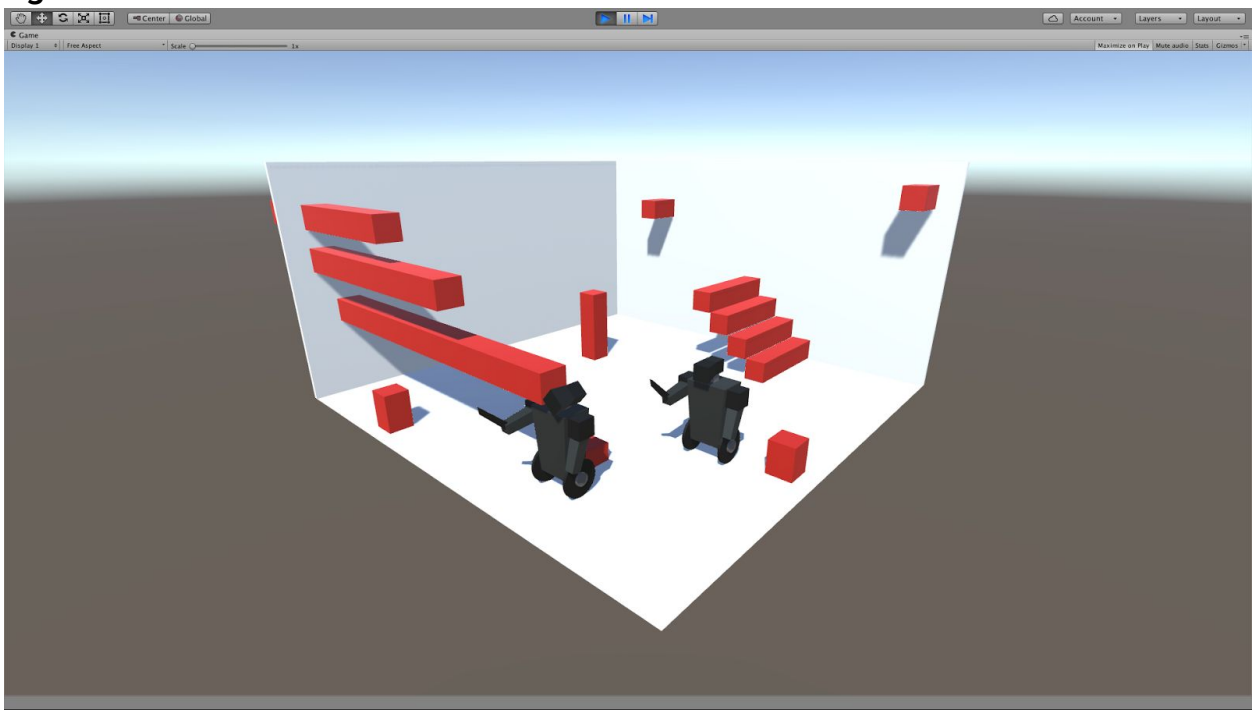
- Setting (1960s Future)
- Robots

Figure 8.6 - Star Wars The Clone Wars: (S4E17: The Box)

In this image we see characters interacting with the surroundings of “The Box”. It is a puzzle game of sorts with life and death consequences. Our game will borrow some of these themes as well as the platforming. The Clone Wars is used for the following:

- Platforming
- Puzzles
- Story (Theme/Tone - Escape)

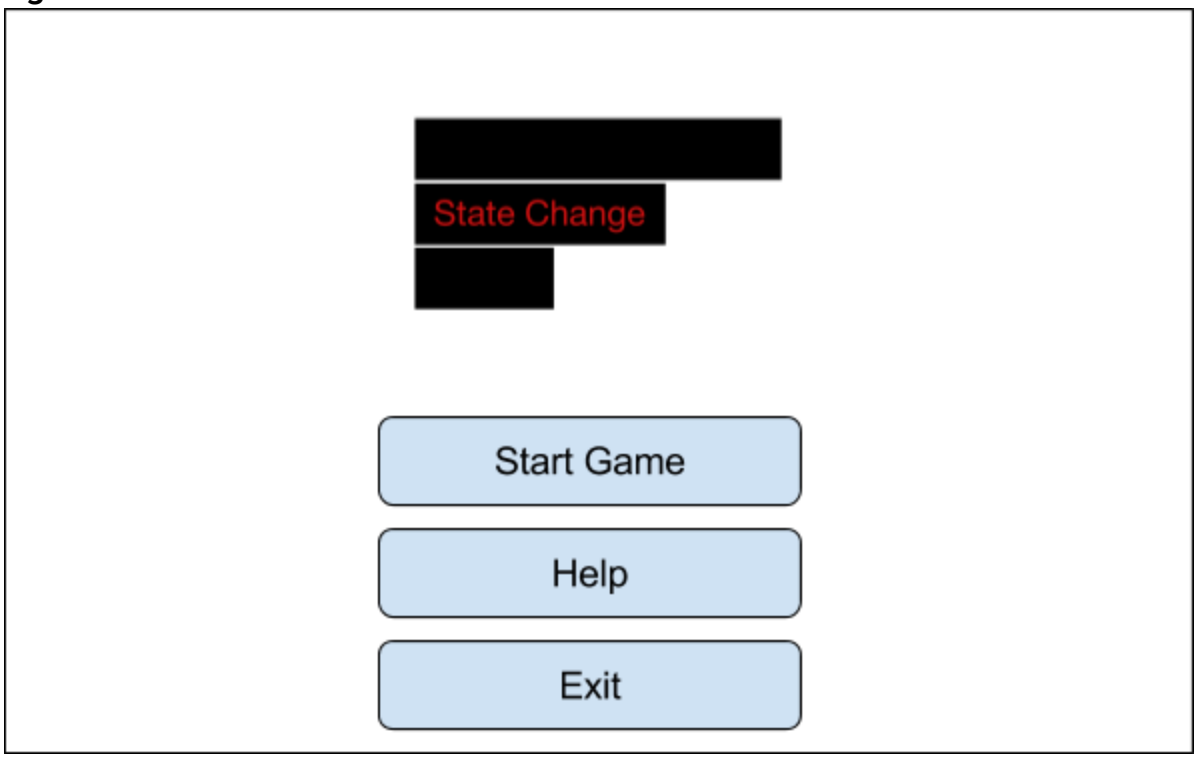
Figure 8.9 - Reference Art



Reference Art: In this image we find an example of our enemies and how they interact with the level.

9. UI STORYBOARDS

Figure 9.1 - Main Menu



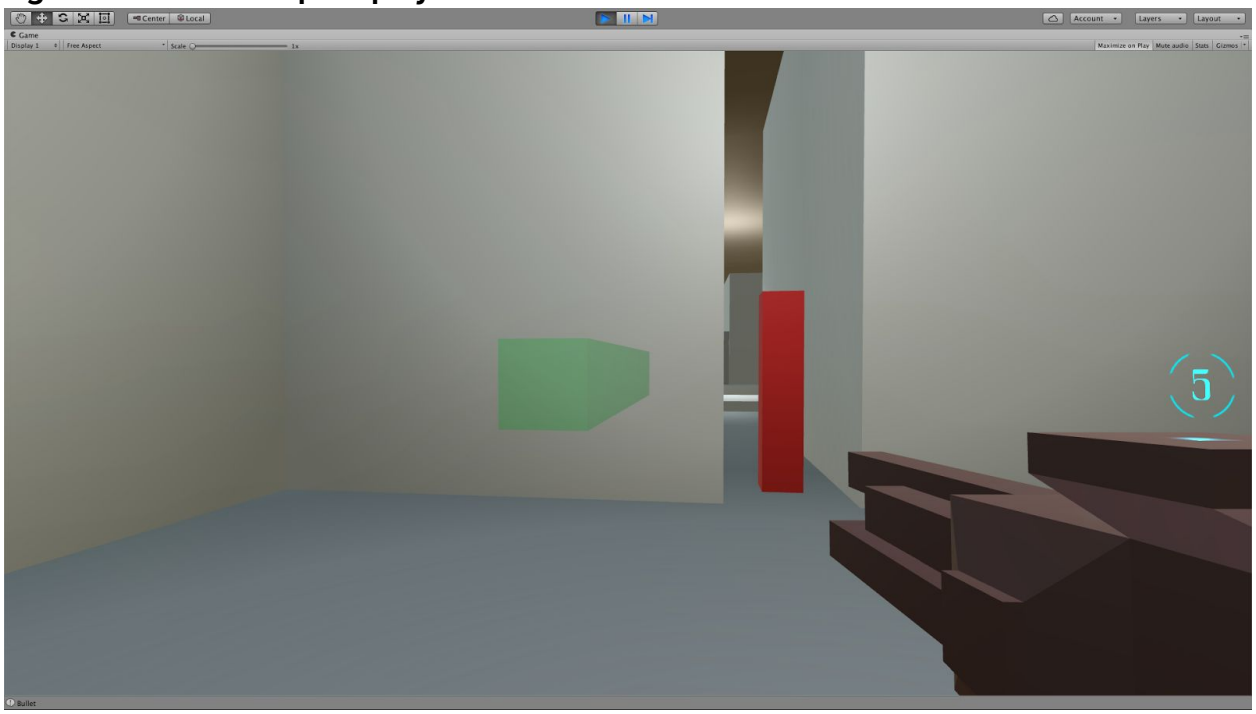
This scene is displayed when the game is first booted.

Start Game Button: Screen fades to black and launches the first level of the game.

Help Button: Displays the game controls.

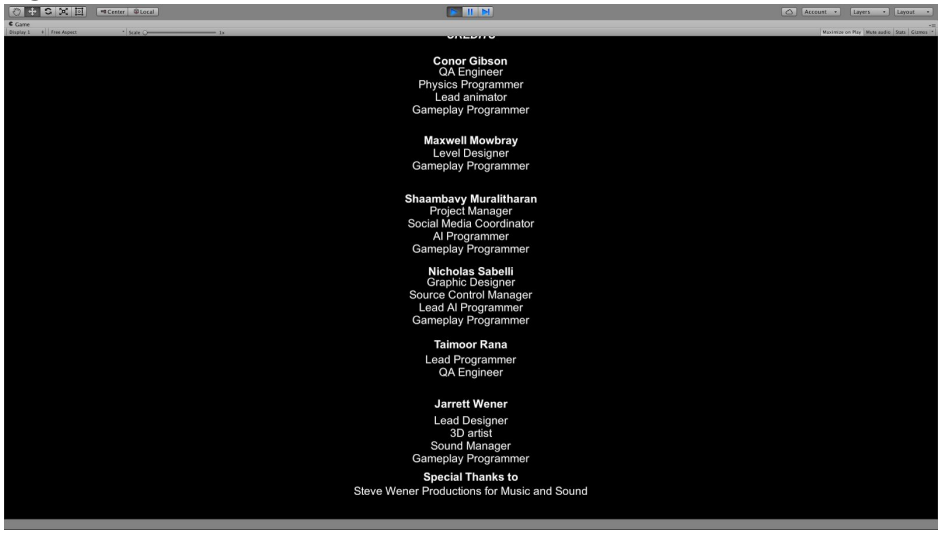
Exit Button: Closes the game.

Figure 9.2 - Heads Up Display



HUD Version 2: Instead of displaying graphics on the screen we've removed them all in the sake of a simpler design. The MASS Gun itself now displays the number of blocks remaining. Also since health is now one hit kill there is no need to display it.

Figure 9.3 - End Credits



Displayed when player completes the game.

10. TAGS AND DIALOGUE

Currently, there is no intention to release the game in languages other than English. While the occasional UI element may appear, for the most part the game is expected to be very succinct where it comes to reading (mainly prompts for introducing controls, which are universal). It is also anticipated for dialogue, if there is any, to be kept minimal as well, to go with the narrative of being somewhere unfamiliar, alone and directionless. For these reasons, tags for text have not been included in this document.

11. TECHNOLOGY PLAN

Design Document

Google Docs
Microsoft Word
Microsoft Paint

Artist Tools

Photoshop
Blender

Programming Tools

Visual Studio
MonoDevelop

Management Tools

Google Docs

Game Engine

Unity

Hardware

PC
Mac

Revision Control
Git (github.com)

12. SOFTWARE ARCHITECTURE

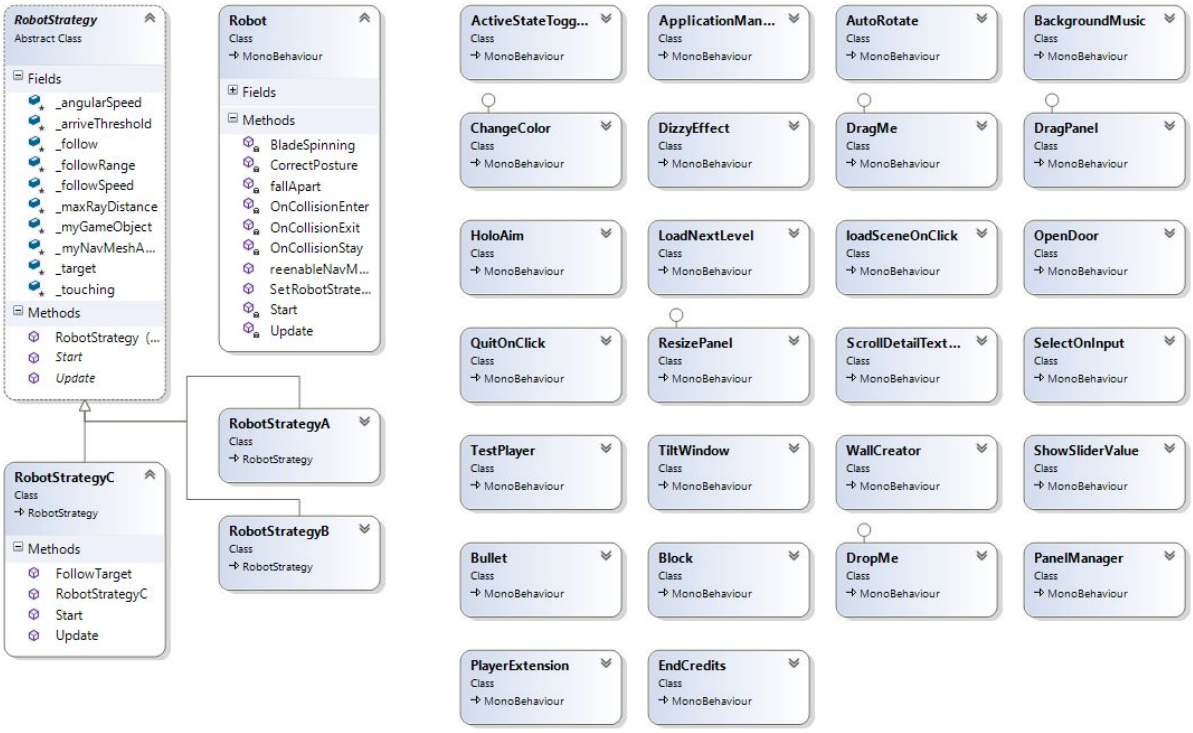
12.1 - Unity Assets

1. FPS Controller
    - Used for player movement
    - Unity standard asset

2. Particle Ribbon
    - Used for particle effects
    - Found at: https://www.assetstore.unity3d.com/en/#!/content/42866

3. Unity Samples: UI
    - Used for main menu
    - Found at: https://www.assetstore.unity3d.com/en/#!/content/25468

12.2 - Class Diagram



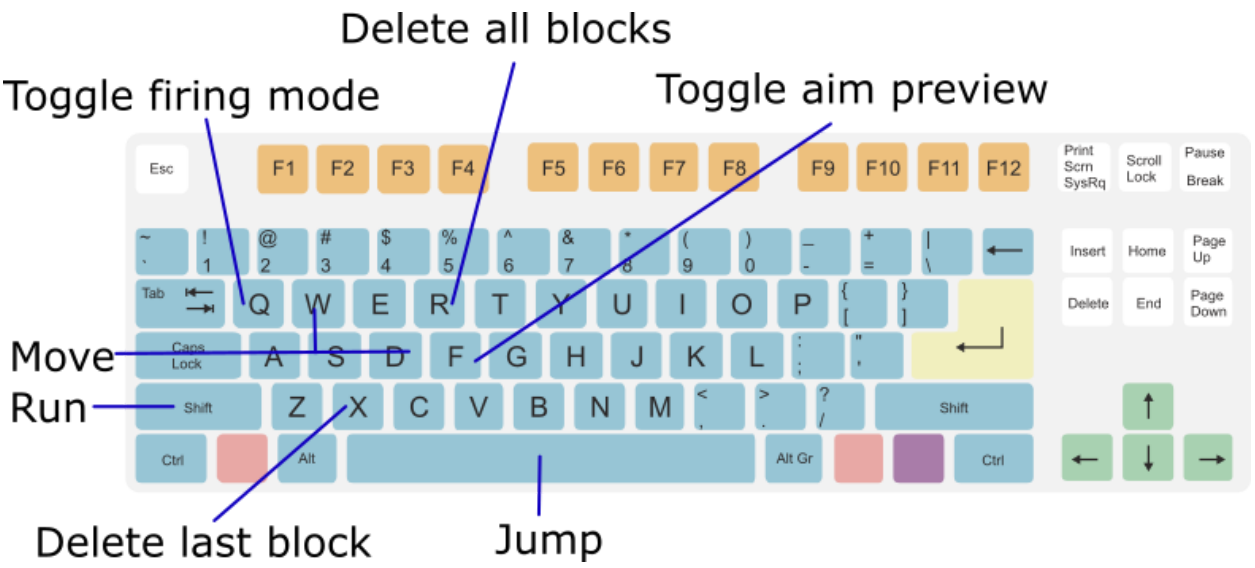
Patterns Used:

1. Strategy Pattern for use by Robot AI

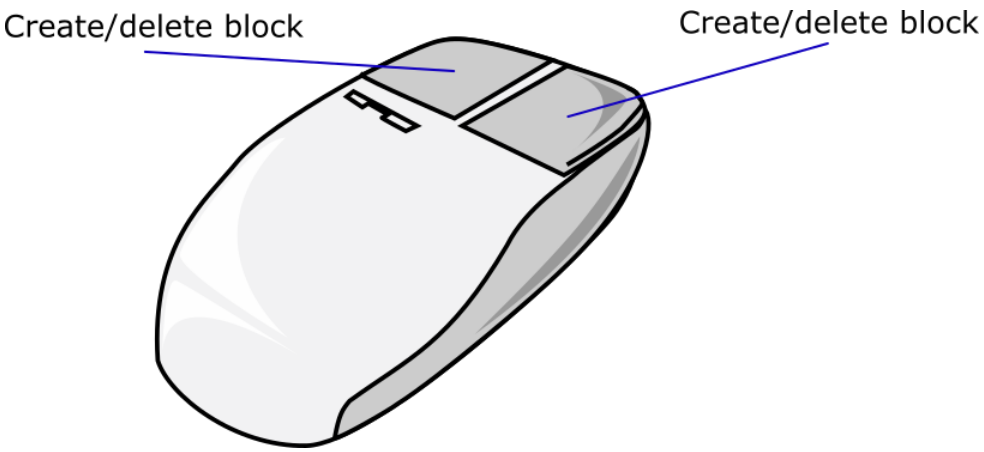
13. CONTROLS

State Change can be played on a PC (Windows/MacOS). These are the control schemes for both input methods.

Keyboard and Mouse

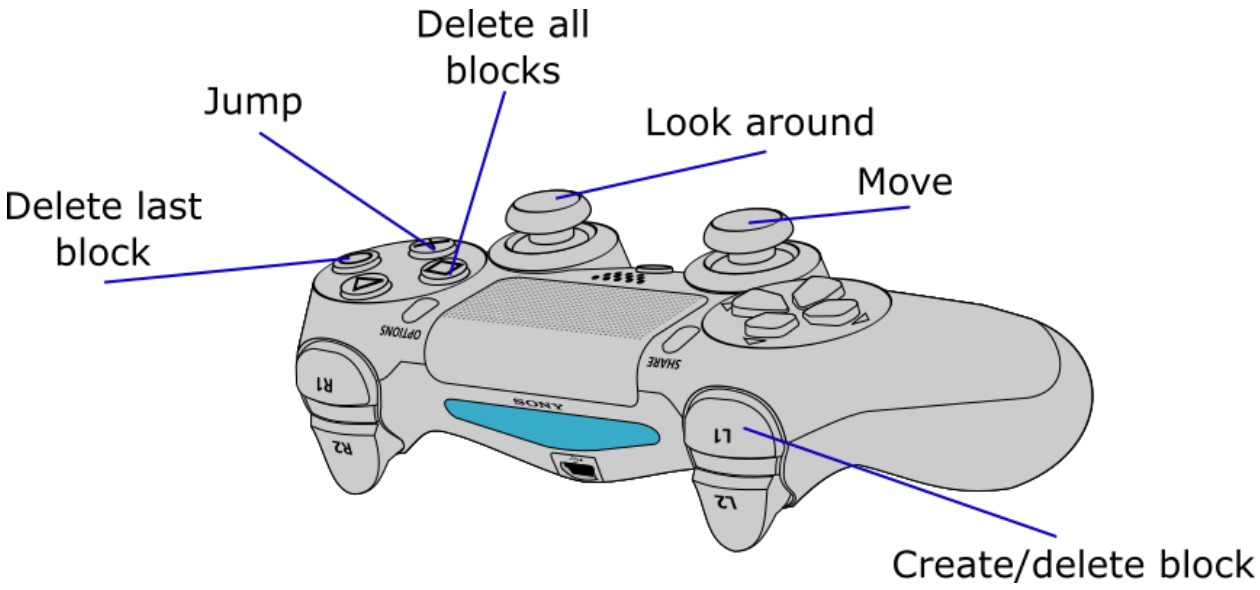


- Movement is controlled using the WASD keys to move and the space key to jump
- The aim-assist feature of the MASS gun can be toggled with the F key.
- Combat block mode and puzzle block mode is toggled with the Q key.
- The R key will remove all existing blocks.
- The X key will remove only the oldest block.



- Moving the mouse reorients the player's view.
- Left-clicking will create a block
- Right-clicking resets the length of a block under construction (puzzle block mode only)

Playstation 4 (PS3) Controller

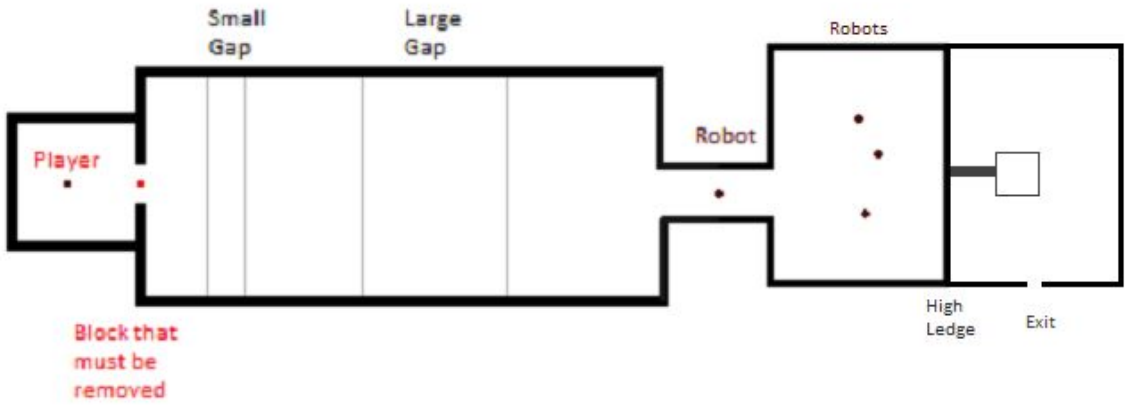


- The left joystick controls player movement, and the right joystick reorients the player's view.
- X allows the player to jump.
- L1 creates a new block.
- Square removes all existing blocks, while circle removes only the last block.

14. LEVEL DESIGN

The levels are designed to teach the player the mechanics and the different ways that they can use the MASS gun. As the game progresses the player will be faced with different kinds of level layouts, requiring them to use new strategies. Earlier levels include more open areas with pillars that can be used to create blocks. Later levels create new challenges in which the floor is made of individual platforms which must be connected using blocks.

Below is a map of the first level which teaches the player the main mechanics and presents them with a small variety of challenges.



1) The room is completely blank, save one hallway, which is barred by a block. This forces the player to learn how to remove blocks
2) The next room contains two gaps that must be crossed. The first can be crossed easily with a standard block, but the second requires the player to switch to charge mode and create a larger one.

3) The following hallway contains a single robot. It bars the way and must be destroyed by the player for them to be able to proceed. The cramped space makes it easy to block off the robot so that the player isn't in real danger.
4) After the hallway is a larger room containing 3 robots. These can be dispatched however the player chooses. Once the robots are out of the way the player has to climb a ledge. This is done by creating a set of stairs using the MASS gun.
5) The final room contains one small platform over a bed of spikes. The lower half of all the walls are dark preventing the player from being able to make bridges over to them. The door is high up on one of the walls. The player must create a set of vertical stairs on the platform they are standing on and then create a bridge to the doorway once they are high enough. This room allows the player to use both skills they have learned during the level to reach the exit, completing the first level.

The design philosophy behind the levels of State Change was to always provide the player with something new. Even though some puzzles and challenges may look similar, small changes can drastically change how the play approaches the encounter. A combat room where the player cannot manipulate the floor requires them to use their space and the walls more strategically. A room made up of small pillars requires the player to use the MASS gun to change their perspective so that they may create a block in the desired location. Additionally, each level has alternate ways of completing it to allow for replayability. For example a room with a lot of robots can be escaped passively, by creating blocks on the ground and jumping between them.

15. MECHANICS ANALYSIS

One of the game's central mechanics is firing the MASS gun. It requires reflexes and strategy. The player must shoot the correct locations to generate blocks that solve puzzles. They must also strategize and create blocks so that the enemies are forced into positions where they can be destroyed by a carefully placed shot. It also requires accuracy and positioning since shots must hit specific walls to create blocks.

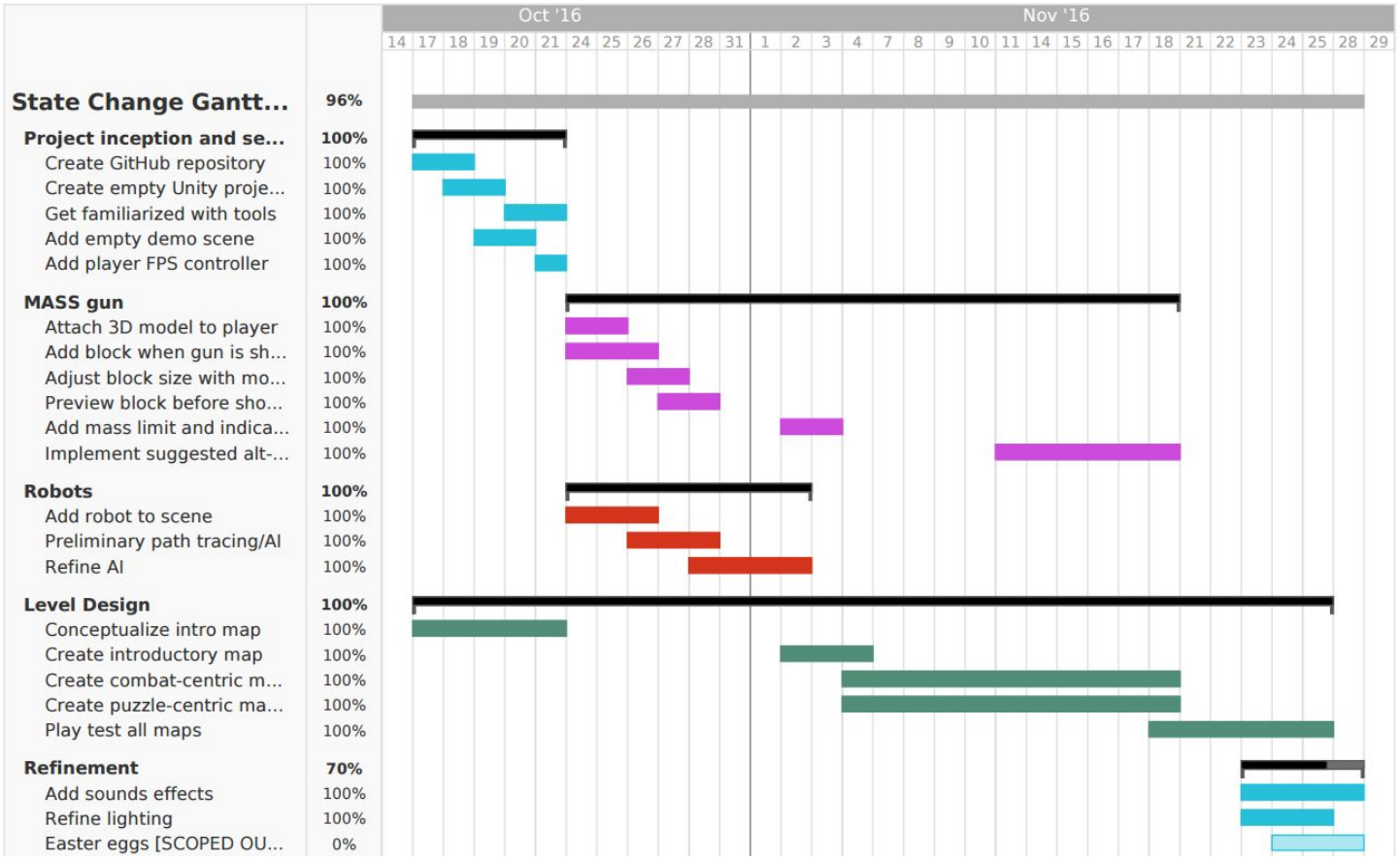
Many games use shooting as a mechanic but in most games enemies are dispatched by shooting at them. *State Change* is different in that enemies must be dispatched using blocks which are generated by shooting the walls and floor of the level. The game could have been designed such that shooting enemies does destroy them, but the current implementation encourages careful planning during combat. The requirement of shooting nearby walls requires the player to position themselves and force the enemy into a position where they are close enough to a wall so that the enemy can be destroyed by a block.

The number of blocks that the player can have active at a given time is very important for balance. In the earlier stages of the game the player should have at least as many blocks available as there are enemies. That way they can dedicate at least one block to each enemy so that they have time to set up for destroying an enemy. In the later stages of the game more enemies can be released therefore requiring the player to think more strategically and work more skillfully to dispatch the enemies.

Platforming is also an important mechanic. Once blocks have been created, the player must carefully jump between them so that they may reach their goal without falling. They can also stay away from enemies by platforming between their created blocks and the different parts of the level.

The way the platforming needs to be balanced in *State Change* is a bit different than how it is balanced in most games. In many platformers the positioning of platforms is very important. Platforms have to be placed so that they are not too far for the player to jump between them, and often they get further and the path between them becomes more obstructed as the game continues. In *State Change* these ideas still apply, but they are less rigid. Since player has the ability to create new blocks using the MASS gun, and these blocks can be used as platforms, the player does not have to be able to jump between the platforms in the level. Instead, platforms simply need to be in close enough proximity to a wall which the play can use to create blocks. This way the player may use the MASS gun to create a new path in-between the platforms so that they may reach their goal safely.

16. SCHEDULE



All major goals set out near the beginning of the project were completed. The bonus task of adding a few easter eggs for the players to discover was not completed, however, due to time constraints.

17. BUDGET

Being a project for university, the primary concern is in using the development as a means to learn about game design, and as such revenue is not a concern. Costs should be expected to be none if possible. Since this project is not for profit and for the purposes of education, this allows the team access to a large pool of assets which would normally be subject to copyright laws.

Though the team will be creating as much original content as possible, the fallback options will make things much more worry-free. The use of a non-premium GitHub repository for source control will allow for free code management at the loss of privacy. Though the development cycle is short, the low risk nature of the project should minimize unexpected fees.

Estimated costs: $0.00
Anticipated revenue: $0.00
Net outcome: Break even

18. CHANGELOG

- Added conceptual demo scene
- Added projectiles
- Added blocks on projectile collision
- Blocks are now resizable
- Add proper FPS player controls (run/jump)
- Added robot
- Robot AI added
- Added robot and MASS gun updated models
- Added preview view when using MASS gun
- Added ability to remove blocks with MASS gun
- Recolour preview blocks
- Tweaked control scheme
- Added support for PS3 controller
- Added 2 new levels
- Redesigned MASS gun ammo indicator
- Added animations
- Changed UI
- Added NavMesh