



# CoreD

Multi-Lane Tower Defense Game

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# Game Overview

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## **I. Game Concept and Premise**

**CoreD** is a “Multi Lane Tower Defence” with a high emphasis on **resource management**.

You take the role of a military strategist tasked with defending the Core, the central generator powering the city that most of humanity is based in and thrives off of. However, with the progression of humanity, came the robots of the old world, who were left and abandoned to die. Grasping for life, they eventually steeled themselves to come together for a siege upon the city to claim the Core. With both sides fighting for their own survival, you must use the limited resources you have to defend the rest.

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## **II. Genre**

Tower Defence  
Resource Management  
Real Time Strategy (RTS)

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## **III. Target Audience**

Gamers looking for a resource management sim and strategy gaming experience, usually aged around 16 and up.

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## **IV. Unique Selling Points**

Build Your Own Path. Players are able to build turrets to form Multi-lane Defence. Compared to traditional 1-lane Tower Defense games, our game has up to 4 different lanes which feature different effects that can attack simultaneously.

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## **V. Feature Set**

- Free Control of Turret Placement within entire field
  - Turret Upgrades
  - Camera Switching
  - Wave System
  - Lane Buffs/Debuffs
  - Resource & Turret Limit
  - Radar / Minimap
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## **VI. Platforms**

Windows PC

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## **VII. Game Flow Summary**

Refer to the levels section, as each level has slightly different game flows.

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## **VIII. Look and Feel / Visual Style**

Blocky Cyberpunk theme. Top-down Perspective Camera View.

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## **IX. Project Scope / Summary**

2-4 Lanes

1 Tutorial, 2 Levels.

4 Upgradeable Turret Types, and one Miscellaneous turret type(wall)

5 Robot Mobs, 2 Types with stronger variants, and 1 Boss

Wave Number: 4, 6, 8 (Tutorial - Level 2 Respectively)

Radar/Minimap System

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# Gameplay and Mechanics

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## I. Gameplay

### ***Mission/challenge structure:***

The game challenges players to work with limited resources, pushing them to utilise their towers in multiple ways efficiently, all to defend their Core on multiple lanes from waves of enemies with increasing difficulty.

### ***Objectives (What are the objectives of the game?)***

Main Objective:

- Defend the Core by:
  - Preventing enemies from getting to the core
  - Kill the enemies before they get to the core

Sub Objectives:

- Create a longer path for enemies
- Gain Resources to Upgrade and Place Turrets
- Avoid spending too much within a single lane
- Kill Enemies
- Survive the wave.

### ***Play Flow***

1. Start Screen
2. Select Level
3. Wave Preparation:
  - Check Resources and Lanes
  - Place Turrets
  - Sell Turrets
  - Upgrade Turrets
4. Wave Spawns
5. Mid Wave Actions / Occurrences
  - Defending against waves
  - Placing Turrets
  - Selling Turrets
  - Upgrading Turrets
  - Switching between lanes
  - Gain power
  - Enemies reach the Core
  - Game stops the player from blocking the whole lane, stopping the enemies from moving.
  - Pause/Resume Game
6. Wave End
  - Wave Clear
  - Receiving Wave Clear Bonus

- Lose (Wave End due to loss of all lives)
  - Win (Survived Last Wave Successfully)
7. If Player Wins or Loses, repeat from 2. Otherwise, repeat from 3.

## II. Mechanics

### - **Physics (How does the 'physical' universe of the game work?)**

The game has no tangible physics that the player interacts with except the camera rotation, although the turrets and enemies are grounded to the floor. Enemies move at speeds that differ with their type.

### - **Movement (general movement; other movements)**

Enemies have a dynamic pathing system which allows them to navigate around objects placed by the player. Different types of enemies move at different speeds, and in the case of the boss, he does not move at all.

### - **Objects & Actions (How the player interacts with the game world and its objects)**

Objects (Turrets and Walls) are selected through keyboard commands(hotkeys) or by clicking on their respective buttons which allow the players to place them on the lanes with their own planned strategic placement on the field, or sell and upgrade any turrets after placement.

When placing a turret, there is a feedback system that indicates to the player if a turret can be placed at the chosen spot, in the form of an overlay that indicates where turrets will be placed in correspondence to the mouse position.

There is also a tooltip feature so that unfamiliar/confused players can read what each feature does and pick up the game faster.

### - **Combat (what kind of combat system or model?)**

List of Turret Types:

**Cannon (Single Target, Medium Fire Speed, Low Damage)**

They are used largely for chip damage, granted the fact that they have a short range, requiring more strategic placement for full effective use of them, though upgrading them increases their damage, fire speed, and range.

**Rocket (Single Target AoE, Slow Fire Speed, Medium Damage)**

These are used for damaging large groups of enemies all at once, serving as a countermeasure to waves where enemies attempt to overwhelm the player with pure numbers. It fires a rocket at a group of enemies, damaging them with AOE damage, and with enough damage to gravely damage

**Sniper (Single Target, Slow Fire Speed, Very High Damage)**

Can target enemies anywhere on the same lane unless they are in its blind spot, which is a short radius around it. It can be used to pick off enemies that escape the initial blockade, or remove large chunks of health off tankier and slower enemies.

**Slowing Turret (Multi-Target AoE, High Fire Speed, No Damage)**

Targets ALL enemies around it, slowing their speed down to give other turrets more time to shoot them, or to give the player time to respond or change their turrets to suit the types of enemies.

List of Enemy Types:

- Normal Robot (Medium Speed, Low Health)
- Tanky Robot (Low Speed, High Health)
- Normal+ Robot (High Speed, Medium Health)
- Tanky+ Robot (Medium Speed, Very High Health)
- Boss Robot (Doesn't move, Doesn't have health)

Enemies will try to reach your core and your goal is to defend through the usage of turrets, but you will not have enough firepower to kill them easily, and hence the main combat aspect of our game is placing turrets strategically within the bounds of the turret limit and resources obtained.

- **Economy (how the economy of the game works, if any)**

**Methods of gaining Money:**

Clearing Waves (100 x Wave Number)

This is to ensure that the Player gets enough money to do something of value, rather than giving the player a small minute amount that does not add up to anything of value.

Killing Enemies (Depends on type of enemy killed)

As the number of enemies will increase, this will be the main source of money, scaling with the difficulty to reward the player for killing more enemies.

Normal	Tanky	Normal+	Tanky+	Boss
25	15	5	5	0

Selling Turrets (Half Money Spent is returned)

This is implemented to give the player the option of cycling their money through different uses, in the case or situation that the player is in dire need of money, it gives them the choice of selling off turrets on one lane at the risk of weakening that lane in exchange for strengthening another.

**Uses/Applications of Money:**

Placing Turrets (Depends on Turret)

The turrets are placed at the cost of Power(Money), and scale up with the effectiveness, damage, and range of a turret. This is to ensure that one turret will not be used more over the other, but rather, it provides an affordance for the player to consider when deciding which turret and where to use it.

Cannon	Sniper	Rocket	Slow
100	200	300	300

Placing Walls (Cost 50)

These are offered as an alternate choice or option to the turrets, used mainly for redirecting the enemies, at a lower cost, offering a more affordable solution for players who wish to extend the path of enemies to have an easier time.

Upgrading Turrets (Depends on Turret)

The upgrade scales off the original turret's value, increasing in set values rather than multiplicative values to ensure that the upgrade price does not spike up at uncontrolled rates.

	Cannon	Sniper	Rocket	Slow
Upgrade 1	150	300	450	450
Upgrade 2	200	400	600	600

In general, the gains and applications are meant to be balanced out, giving the player a cycle of Buy, Require More Money, Kill Creeps for Money, Buy Turrets, Defend.

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### **III. Screen Flow**

Not applicable, as the layout and scene is always the same.

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### **IV. Game Options**

Sound Control - Affects sound

Time Control - Affects how fast the game is proceeding in real-time. Players can set it to 1x or 2x at any point in the game, or pause to stop it.

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### **V. Replaying & Saving**

Game levels can be replayed at any time through the level select screen.

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### **VI. Cheats & Easter Eggs**

None planned at the moment.

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# Setting, Story, and Characters

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## I. Game World

### - **Look and Feel of the World; Visual Style**

Simple Cyberpunk world. Dark environment is lit up by neon lights and signs on the streets. Different colours of neon lights represent different things such as buildings, turrets and mobs.

### - **General Description**

CoreD's Game World is an urban cyberpunk semi-utopia under siege from robots made of old technology, under the banner of seizing a source of electricity to prevent themselves from running out of power and dying.

### - **Physical Characteristics**

The current area that you are defending is about 500 meters by 500 meters. (8 by 12 grid per lane, arranged in a plus shape around an 8 by 8 core)

### - **Levels (and how it connects to other areas)**

Each level will have 2 to 4 lanes that you have to defend simultaneously, from 2 lanes in the tutorial to 4 lanes in Level 2. During a level, enemies of different types and sizes will appear in the lanes.

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## II. Story and Narrative

### - **Backstory**

You take the role of a military strategist tasked with defending the Core, the central generator powering the city that most of humanity is based in and thrives off of. However, with the progression of humanity, came the robots of the old world, who were left and abandoned to die. Grasping for life, they eventually steeled themselves to come together for a siege upon the city to claim the Core. With both sides fighting for their own survival, you must use the limited resources you have to defend the rest.

### - **Plot Elements**

The Core, which serves as the central motivation for both sides to contest each other's progress and survival.

The robots as a unanimous force that opposes the player.

### - **Game Progression**

The game's progression is framed as attacks over a certain amount of time, with each level being different groups of robots from different places coming to attack the player, with their numbers gradually

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increasing as more and more of them rally together, attacking from many different directions, shown as the different lanes.

### **III. Characters**

#### **Robots**

##### **- Backstory**

Robots:

The robots are considered as the wreckages and leftovers of the old civilisation, unable to keep up with humanity's evolution, nor assist it. Hence, they were abandoned by the humans, left dormant for a day when they might be needed once more. However, the robots were eventually forgotten about, along with the system that controlled their functions. The humans began to cut power from their storage facilities, which caused the AIs to eventually turn to violence against the humans for the acquisition of a perpetual energy source, the Core.

##### **- Personality**

Robots:

They do not have much of a personality, despite being controlled by an evolving and somewhat sentient AI, but they do exhibit traits of desperation and weakness, as shown by them following paths created by the humans, derived from knowledge that without power, they are simply husks that cannot do much. However, they all share the same mind, which leads to their ability to coordinate attacks and launch multiple attacks from different lanes simultaneously.

##### **- Appearance**

Robots:

The Robot's bodies are generally round with fins on the tops and sides for balance. They have a large booster on their rears to propel them forward to move them toward the core.

##### **- Physical characteristics**

The Little Boy is a small sphere with 4 fins sticking out of its sides.

The Fat Man is a slightly larger sphere with also 4 fins but also comes with 2 rockets on its sides.

The boss robot is a huge sphere that will sit at the end of the lane. It has a laser replacing its front eye and has a larger set of 4 boosters on its rear. The Tsar Bomba has a rotating ring in place of the fins used by the other two for balance.

##### **- Animations**

The robots mainly bob up and down when moving forward. The death animations of the Little Boy and Fat Man will be of their movement faltering for a second before they fall to the ground with a small explosion.

##### **- Abilities**

The Little Boy is a basic mob with fast speed and low health, it does not have any special abilities.

The Fat Man robot boasts a larger health pool with slightly slower speed.

It also can shoot a laser that destroys turrets on its lane. It cannot move.

- **Relevance to the story**

The robots serve as the main antagonists, they have a very basic AI and run on the same power that the Core contains that powers the human city. They will try to steal energy from the core to survive.

- **Relationship to other characters**

Antagonists to the Commander, and targets for the turrets.

- **Statistics/Attributes**

Name: Little Boy

Description: Fast, but they have lighter armor in exchange for their speed.

Health: 5

Speed: 3

Resource (Given on destruction): 25

Name: Fat Man

Description: Average speed with average armor, they are the most common types of enemies you'd see.

Health: 15

Speed: 2

Resource (Given on destruction): 15

Name: Little Boy+

Description: Fast, but they have lighter armor in exchange for their speed.

Health: 15

Speed: 4

Resource (Given on destruction): 5

Name: Fat Man+

Description: Average speed with average armor, they are the most common types of enemies you'd see.

Health: 30

Speed: 3

Resource (Given on destruction): 5

Name: Tsar Bomba

Description: The most heavily armored and it almost cannot move, but it can shoot a laser that destroys turrets.

Health: N/A

Speed: 0

Resource: 0

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## Turrets

- **Backstory**

Turrets:

The turrets are machines quickly assembled for the purpose of fending off and putting a stop to the robot invasion, but a large problem plagues them. They are not anymore developed than the robots were, as humans had directed all efforts and resources to develop and research more beneficial studies, under the guise of unity and evolution amongst all humans now that they were no longer fighting each other, but they would not expect for the robots to turn against them. Hence, the turrets are still primitive compared to other characters of the game.

- **Personality**

Turrets:

They like shooting. A lot. At robots.

- **Appearance**

Turrets:

- Cannon

The cannon is the basic turret that the player would place down. Starting with a moderate fire rate and damage, it can be upgraded to have a hire fire rate while maintaining the same damage value throughout. As such, the size of the cannon becomes bigger. The first level shows the cannon having a single barrel model, while the second level shows the cannon having 2 barrels and a wider chassis. The third upgrade turns the cannon into a full blown minigun.

- Rocket Launcher

The rocket launcher shoots out rockets that have high damage and a blast radius but at the cost of the fire rate. When upgraded, it provides a higher damage and larger blast radius. The first level of the rocket launcher shows a single barrel compact launcher that does not have many moving parts. The second level of the launcher boasts a bigger chassis and a barrel protruding from the front of it. The third level shows the chassis even bigger and is double barreled.

- Slow Tower

The slow tower basically slows down enemies as they pass through the field it emits. When upgraded, the slow tower increases its effects of the slow and has a wider range. The first Level shows the tower with basic antennas and having a slim frame. The second level displays more antennas and a heavier frame. The third level has a large frame with bigger antennas.

- Sniper Tower

The sniper tower does high damage but hits one enemy at a time and has a longer range but at the cost of having a slower fire rate. When upgraded the sniper is able to deal higher damage. The first level of the sniper shows a basic chassis with a fat and long barrel. The second level shows a bigger chassis with a rail from the chassis to support the barrel which is longer than before. The third level shows a taller chassis with a significantly larger barrel that protrudes through the chassis.

- **Physical characteristics**

Common Colours:

Dark Grey, Grey and Silver

Cannon:

The cannon uses a rifle barrel in its earlier stages before it gets upgraded into a gatling gun.

Rocket:

The Rocket Launcher has a bulky frame with either no barrels poking out or very short barrels. The clunkiness and the height of the turret allows it to show that it's a rocket turret.

Slowing Tower:

Tall and slim in design. Does not have any areas to show that it's sticking out or shows that it can shoot anything. All upgrades keep to the same principle.

Width and Length wise, the turrets measure 2m by 2m at the base, and their turret gun attachments measure roughly the same length, but not the same height or width.

- **Animations**

The Turrets mainly rock back and forth from the force and recoil of firing.

- **Abilities**

The Turrets also similarly cover different areas of abilities.

The Cannon is not very aptly named, but it was the first turret to be made, possessing low firepower and range and medium fire rate, but it has potential and can be upgraded to be a fairly well rounded turret.

The Rocket Launcher is basically a Rocket Launcher strapped to a big stick, possessing decent range and medium damage, enough to wipe out smaller enemies easier.

The Sniper Tower was a Tower built to use higher caliber rounds for stronger and more armoured targets. It deals very high damage, but due to its use of high calibers, it takes longer to reload and aim.

The Slow Tower is a special Tower built for the purpose of slowing enemies, on the off chance that the enemies are too strong and cannot be stopped in time, the Slow Tower can be used to buy the Player more time.

- **Relevance to the story**

The turrets are the only thing between the loss of the city and the robots, with the ability to kill them effectively.

- **Relationship to other characters**

<N/A>

- **Statistics/Attributes**

Name: Cannon

Description: Basic Cannon, Single Target, Single Shot.

Damage: 2, 2, 4

Fire Rate: 1, 2, 2 (per second)  
Cost: 100, 150, 200  
Range: 10, 15, 20  
Upgrade Stages: 2

Name: Sniper  
Description: Long Range Turret, Single Target, Single Shot  
Damage: 5, 10, 10  
Fire Rate: 0.25, 0.5, 0.75 (per second)  
Cost: 200, 300, 400  
Range: Whole Lane  
Upgrade Stages: 2

Name: Rocket  
Description: Basic Cannon, Area-of-Effect, Single Shot  
Damage: 4, 6, 8 (1/3 damage for nearby enemies, does not apply to main target)  
Fire Rate: 0.75, 0.75, 1 (per second)  
Cost: 300, 450, 600  
Range: 15, 20, 20  
Upgrade Stages: 2

Name: Slow  
Description: Area-of-Effect, Slowing  
Damage: 0 (does not do damage)  
Fire Rate: 0.4, 0.6, 0.8 (per second)  
Cost: 300, 450, 600  
Range: 10  
Upgrade Stages: 2

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## Core

### - Backstory

Core:

The Core is the fruit of the humans' research and development efforts, creating a perpetual energy source that would pave the way for humanity's evolution, until the siege of the robots. It is regarded as the golden fruit of this game, one that people and the robots would come to war over, representing not just power and evolution, but also survival for the holders of this "golden fruit".

### - Personality

Core:

It likes to generate power. A lot of power.

### - Appearance

None

### - Physical characteristics

None

- **Animations**

None

- **Abilities**

The Core is able to store power and keep turrets already deployed running.

- **Relevance to the story**

The core is a source of the power that the robots covet.

- **Relationship to other characters**

The core is the structure that the Commander (Player) is trying to protect and what the robots are trying to steal from.

- **Statistics/Attributes**

	Tutorial	Level 1	Level 2
Core Health	5	5	5
Total Wave Count	4	6	8
Starting Resource	800	600	1200
Max Turret Count	16	24	32

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Commander

- **Backstory**

Commander(Player):

You are the Commander, an individual charged with the task of commandeering and deploying the turrets to stop and eliminate the robot uprising, but you are only allocated a certain amount of resources, as the rest was spent on holding off the robots up to that point, or are needed to sustain the city itself.

- **Personality**

Commander:

He is a stoic man who wishes to carry out his duty. And hopefully not die due to failing to carry out his duty.

- **Abilities**

The Commander has the ability to check and view a minimap that shows and reports on the location of enemies, and they can also deploy turrets.

- **Relevance to the story**

The Commander is the person assigned and trying to protect the core from the invading robots.

- **Relationship to other characters**

Controls and Deploys Turrets.

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# Levels

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## I. Tutorial

### - Synopsis

The initial wave of the robots' attack. This attack takes place during the induction of the Commander to his task, causing them to start an impromptu deployment that doubles as a crash course on the Commander's abilities and the capabilities of the Turrets they have access to, as well as the limitations the player has to work with.

### - Introductory material (Cut scene? Mission briefing?)

The mission briefing will be given in the form of the tutorial, highlighting the abilities and resources available to the Commander, along with their objectives

### - Objectives

Defeat all enemies.

Protect the Core from as much damage as possible.

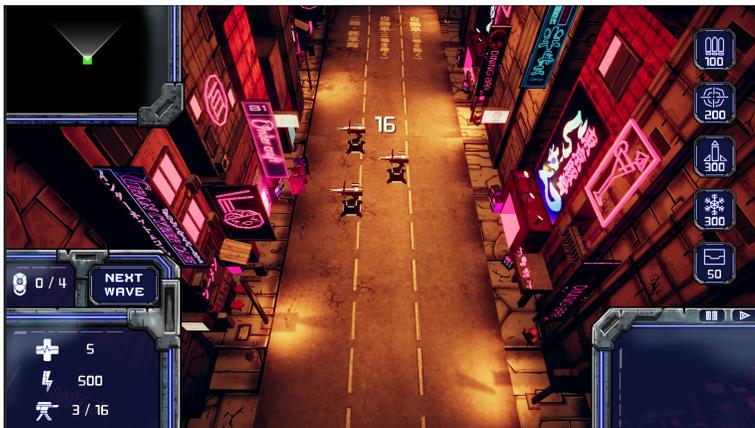
### - Physical description

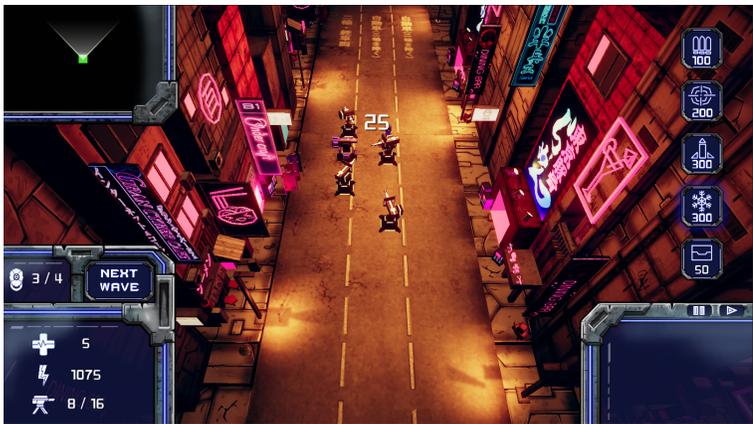
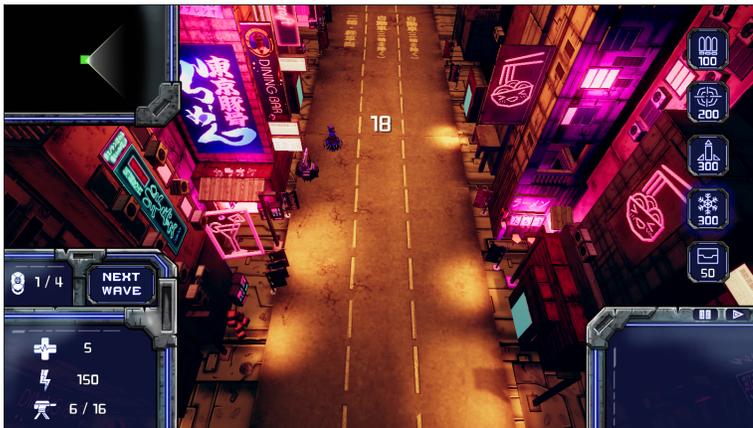
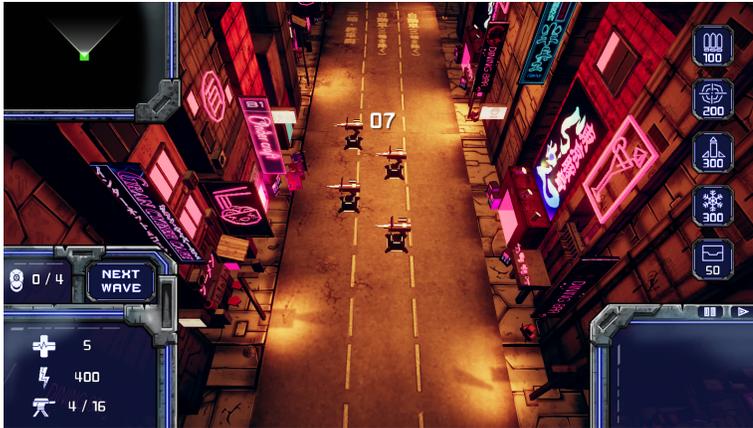
300 meters by 300 meters square field in size, with buildings lining the 2 lanes, which are at right angles to each other.

### - Map

This Level includes 2 Lanes to defend.

### - Critical path that the player and/or A.I. needs to take





- **What encounters are important or incidental**

The encounter with the first wave would allow the player to realise that they cannot place down their towers willy-nilly, and have to place them in such a way that the enemies will walk around all their turrets, wasting more of the enemies' time. This would allow them to be able to defend the next wave, which spawns on a different lane.

- **Level walkthrough**

Place 5 cannons in the north lane, add in a slow turret, then build 3 cannons in the east lane, followed by a slow turret, then put a rocket in the north lane.

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## **II. Level 1**

- **Synopsis**

This is the wave of robots that the Commander was commissioned to take care of, a large wave that had been moving toward the city in the past week. It reportedly has a large dangerous entity among its ranks, leading to the incorporation of the Commander into the forces, and the creation and repurposing of the turrets.

- **Introductory material (Cut scene? Mission briefing?)**

N/A

- **Objectives**

Defeat all enemies.

Protect the Core

- **Physical description**

300 meters by 500 meters field in size, with buildings lining the 3 lanes, which are at right angles to adjacent lanes.

- **Map**

This level includes three lanes, each of which have the following properties.

Lane 1: Enemies move 50% faster

Lane 2: Turrets shoot 30% slower

Lane 3: Enemies have 100% more HP

- **Critical path that the player and/or A.I. needs to take**

1 slow and 1 rocket on the middle of the north lane, then 1 slow and 1 rocket on the right of the south lane, then 1 slow and 1 rocket on the left of the east lane. Upgrade the rocket to level 2 first, on south, east then north lanes. After that, upgrade slows to level 2, then rocket to level 3, and slows to 3. After that place another level 3 rocket in the middle of the north lane. When the boss spawns in the east lane, when he is about to fire, you can sell your turrets in that lane, to save some money. Rebuild more rockets and slows but do not upgrade them.

- **What encounters are important or incidental**

The first wave would move faster than the first wave in the tutorial, prompting the player to put down more turrets/put down a slow turret so that they will be able to survive. It would also introduce them to lane-specific buffs and debuffs in more detail as the turrets placed in the third lane would have reduced attack speed.

- **Level walkthrough**

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Same as Tutorial, however you start using rocket + slow combos in all 3 lanes.

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### III. Level 2

- **Synopsis**

The final level of the attacks was found to be a culmination of all robots all at once, gathered by the boss after we failed to completely destroy him. This is the final battle, all or nothing.

- **Introductory material (Cut scene? Mission briefing?)**

A short UI menu that gives a summary of the level's threats.

- **Objectives**

Defeat all enemies.

- **Physical description**

500 meters by 500 meters square field in size, with buildings lining the 4 lanes, which are at right angles to adjacent lanes.

- **Map**

4 Lanes are Present on the map.

Lane 1: Turrets deal 10% less damage

Enemies move 50% faster

Lane 2: Turrets attack 40% slower

Enemies have 20% more health

Lane 3: Enemies have 100% more HP  
Lane 4: Turret Area-of-Effect range is 50% smaller  
Enemies move 100% faster

- **Critical path that the player and/or A.I. needs to take**

Save up at least 2k for the first boss encounter, at Wave 6, and save whatever money you can during wave 8 by selling unused turrets. Keep some form of crowd control on all lanes, but do not upgrade them as they may be destroyed. Otherwise, if you trust your luck, you can upgrade them as much as you want.

- **What encounters are important or incidental**

The Boss Encounter

- **Level walkthrough**

Wave 1 - Place 3 - 4 turrets at least on Lane 1 and 2

Wave 2 - Use at least 2 rockets and slow towers to easily clear the wave

Wave 3 - Not much change needed, but upgrading some towers on Lane 1 helps

Wave 4 - Set up a Rocket/Slow Tower combo on Lane 4

Wave 5 - Set up a backline of defence for stronger enemies on the attacked lanes, and upgrade some towers on Lane 2

Wave 6 - Add more turrets to all sides, with Lane 4 needing the least attention. Use Single target damage towers in lane 3 to deal with the staggered flow of enemies, such as the Level 3 cannon

Wave 7 - Add more crowd control to all sides using rocket and slow towers

Wave 8 - Stall for time using slow towers and rockets, or use cannons that are upgraded to fully whittle away at the enemies, but be careful of the boss once again.

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## Interface

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### **I. Visual System**

- HUD (What are the Controls?)

#### **Gameplay Relevant Controls**

Q and E to pan the camera left and right to the other lanes..

Mouse Left Click to Select a Turret to build

Mouse Left Click to Place (After Selecting a Turret)

Right Click to Escape Placement Mode (After Selecting a Turret)

Left Click Pause Button to Pause

Left Click Game Speed Button to change game speed

Left Click Turret to open Radial Menu for Upgrade and Sell

Right Click to close Radial Menu

Left Click Sell Button or Upgrade Button

### **Non-Gameplay Relevant Controls**

Left Click to Select Quit Button

Left Click to Select Options Menu Button

Left Click to Resume Game Button

#### - Menus

CoreD's menus are as follows, sorted, by the scenes or parts of the game they can be found in.

### **Title Screen**

#### **Main Menu**

- Start Game
  - Level Select
    - Tutorial
    - Level 1
    - Level 2
- Options
  - Sound
    - Sound Sliders
    - Controls
    - Back Button
    - Apply Button(?)
    - Brightness(?)
- Credits
- Quit Game

#### **In-Game**

- Next Wave
- Change Gameplay Speed (1x / 2x)
- Pause
  - Continue Game
  - Back to Main Menu
- Turret Selection (Button Spread Displayed on the side)
  - Cannon Turret
  - Sniper Turret
  - Slowing Turret
  - Rocket Turret
  - Blocker

- Radial Menu (Clicked on Turret)
  - Upgrade
  - Sell
  - (Right Click to Exit)

- **Camera**

The camera pans from one lane to another, allowing the player to check each lane. It is set at a downward tilted angle, allowing the player to see the lane and enemies coming toward them in a perspective camera view. They rotate between different positions to see the lane. It can be controlled using Q and E. Aside from the main camera, there is also a radar minimap, that shows or indicates which lanes you are looking at currently. Red glows will show up on the sides to indicate the lanes enemies are coming from, along with red blips to indicate enemies

---

## **II. Control System**

Point and Click for Buttons

Q and E for panning between camera positions

Right Click to escape Placement/Upgrade/Sell Mode

Hotkeys:

Num Key 1 – 5: Select turrets from top to down

Spacebar: Next Wave

Tab: Switch gameplay speed

Tilde (~): Pause

Esc / Right click: Deselect

Left click: Select hover over

---

## **III. Audio**

- **Music**

Main Menu:

Upgrading Alone - Kathali

Level Music:

Deep Blue Sea - Instrumental, Sivan Talmor

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- **Sound Effects**

Universal Sound FX by Imphenzia

- **Help System**

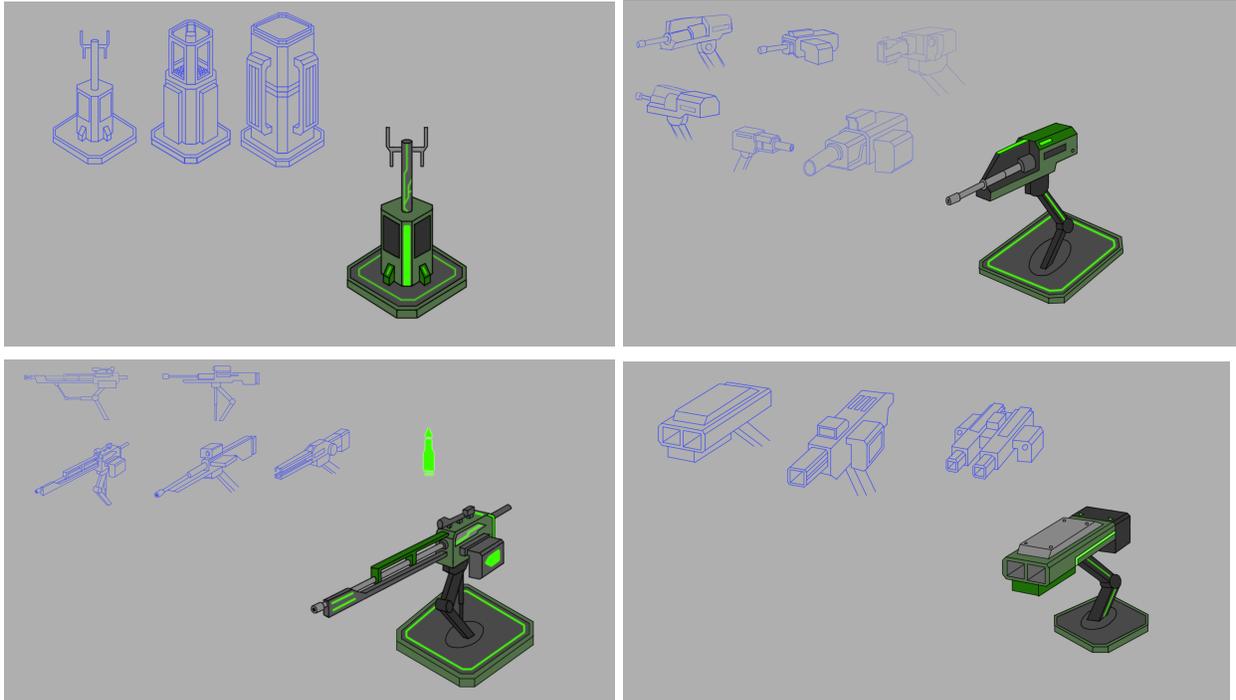
Tooltip

---

# Game Art

## I. Concept Art

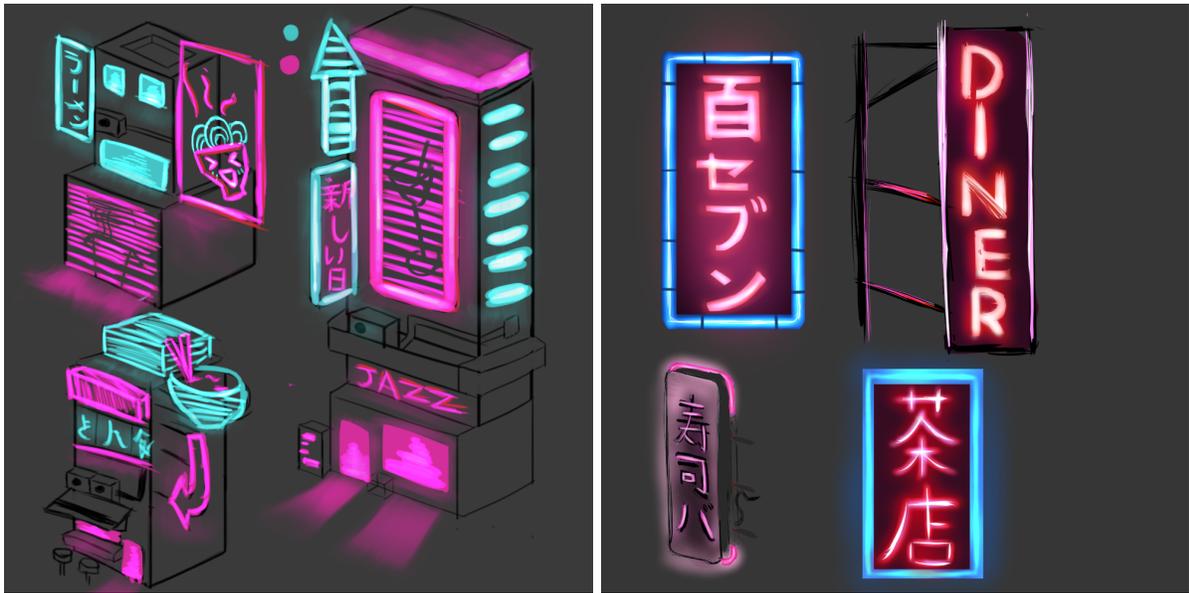
### - Turrets



### - Enemies



### - Environment

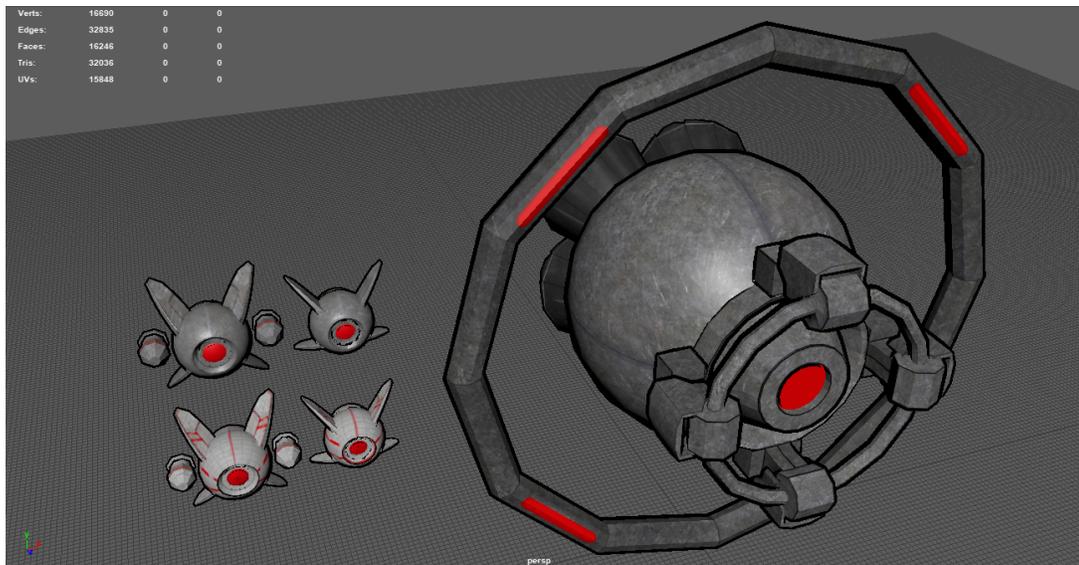


## II. Style Guides

### - Turrets

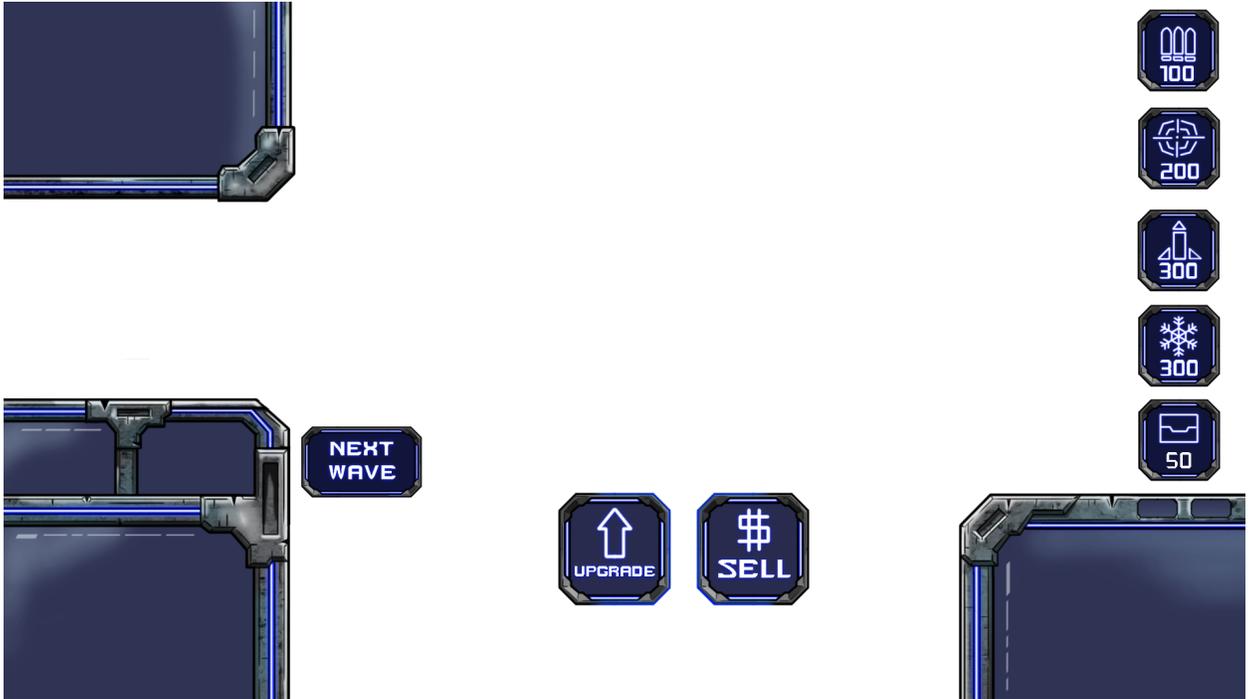
The turrets are following starcraft style of turrets being bulky at the top and bottom while the middle is a little slim.

### - Enemies



### - Environment

- UI



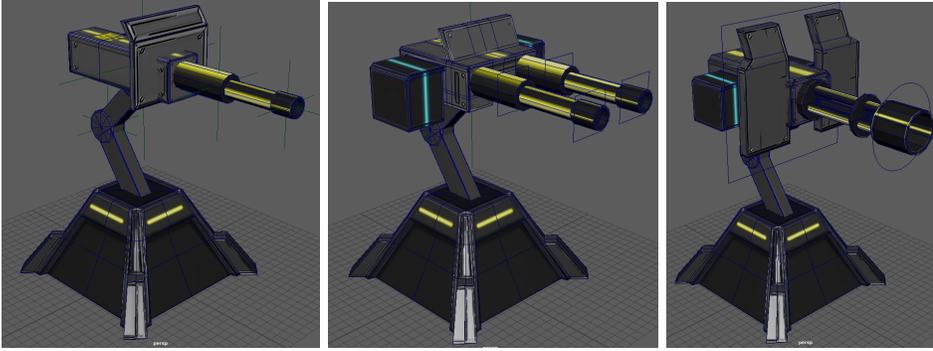
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### III. Characters

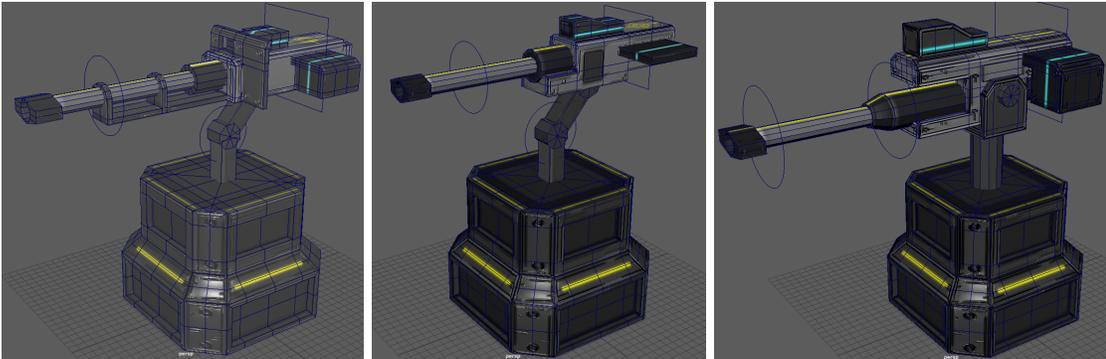
- Turrets

- Standard Turrets

Models, Textures, Animations, UV Emission



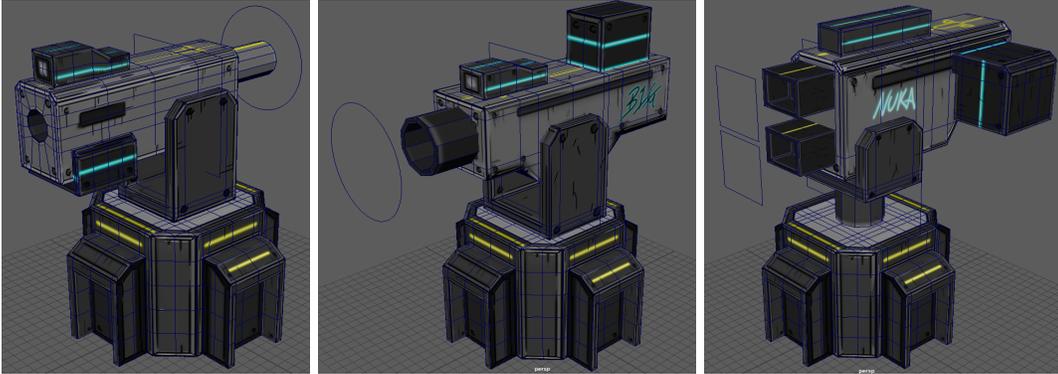
- Sniper Turrets  
Models, Textures, Animations, UV Emission



Snipers changed to have Green neon instead of Yellow.

- Rocket Turrets

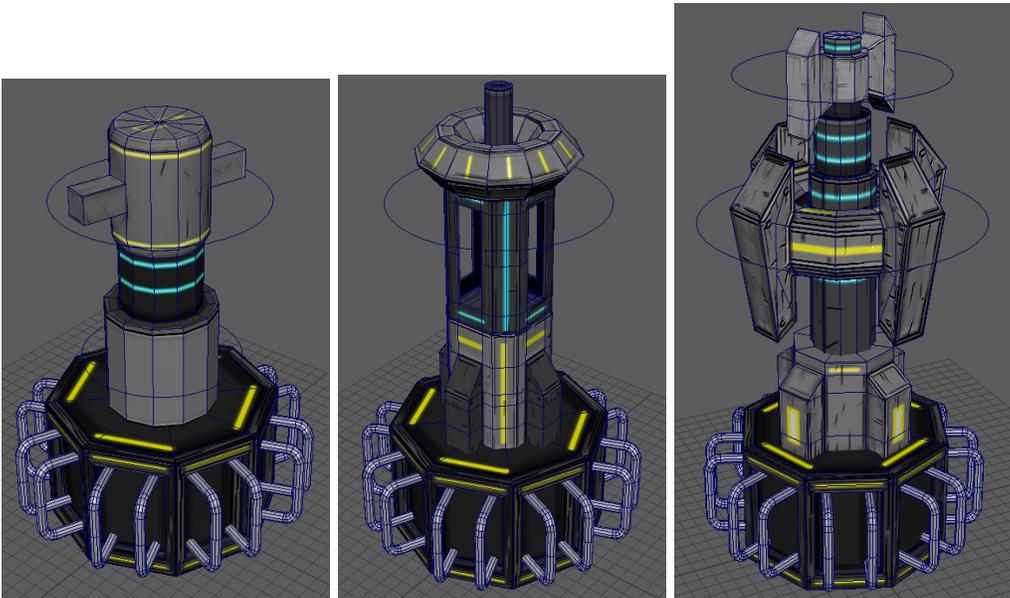
Models, Textures, Animations, UV Emission



Rockets turret has Purple Neon instead of yellow.

- Slowing Tower

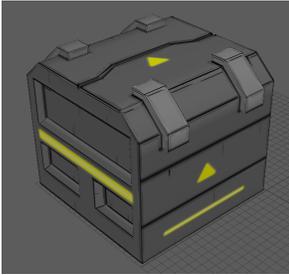
Models, Textures, Animations, UV Emission



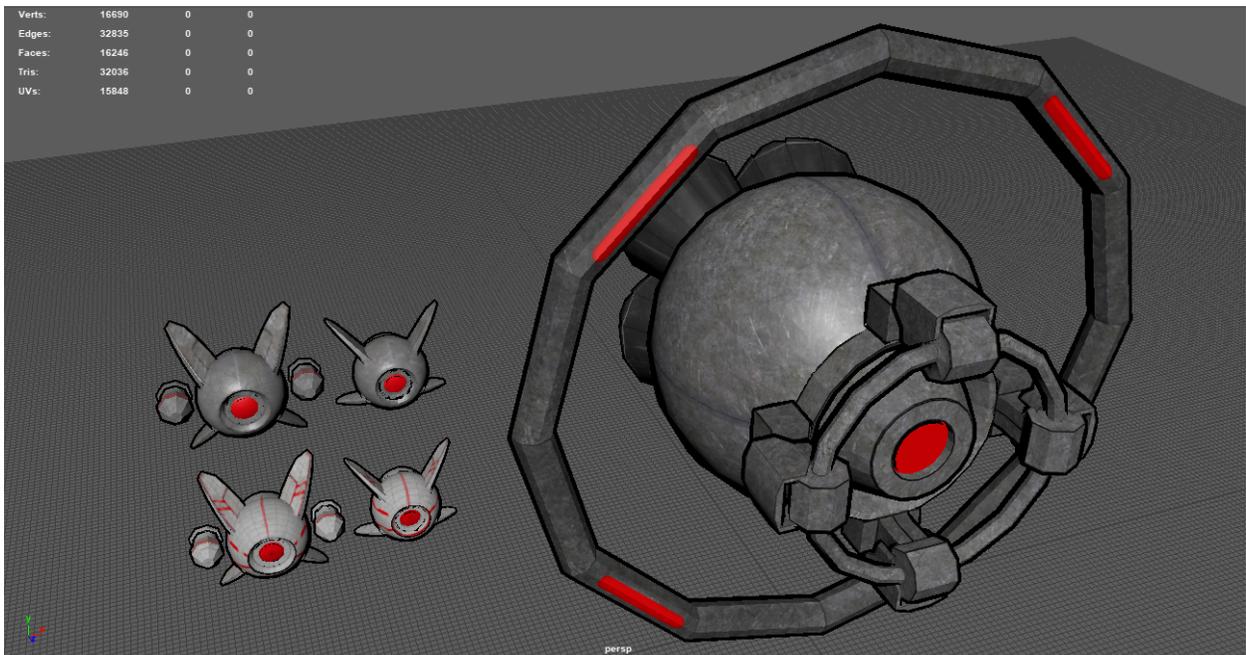
Neon for the Slowing tower has been changed to a Dark Blue instead of Yellow.

- Block

- Model, Texture, UV Emission



- Enemies



**Basic Mob, The larger Tank Mobs and the Boss Mobs, (+ the variants for the basic and tank mobs)**

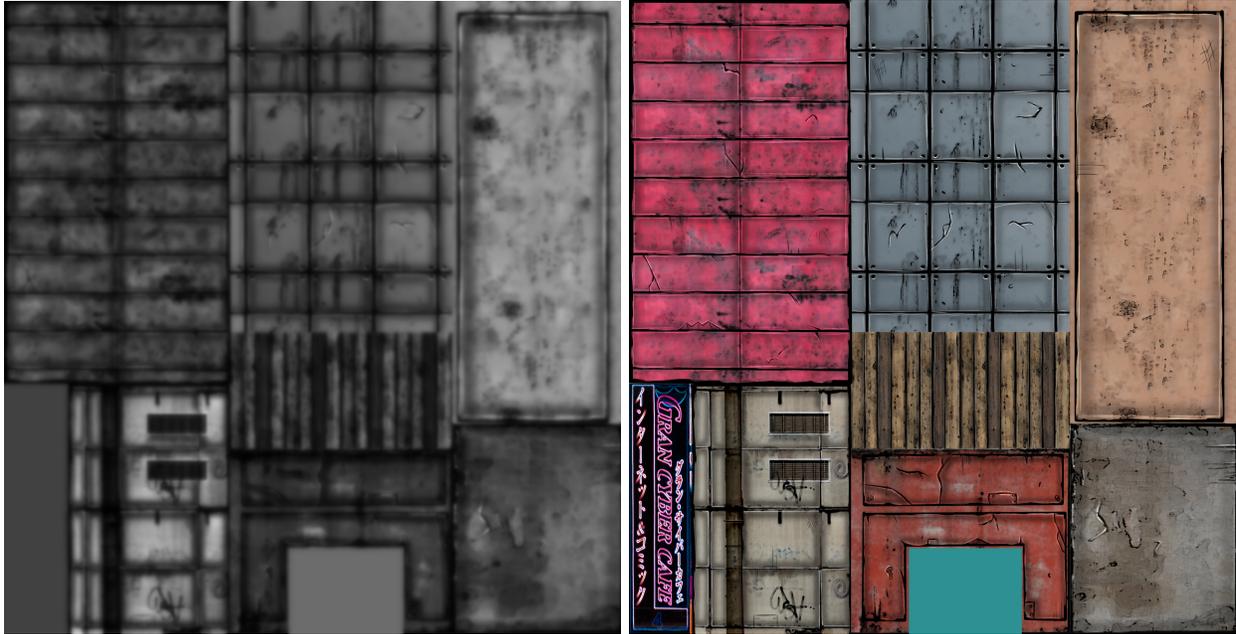
#### IV. Environments



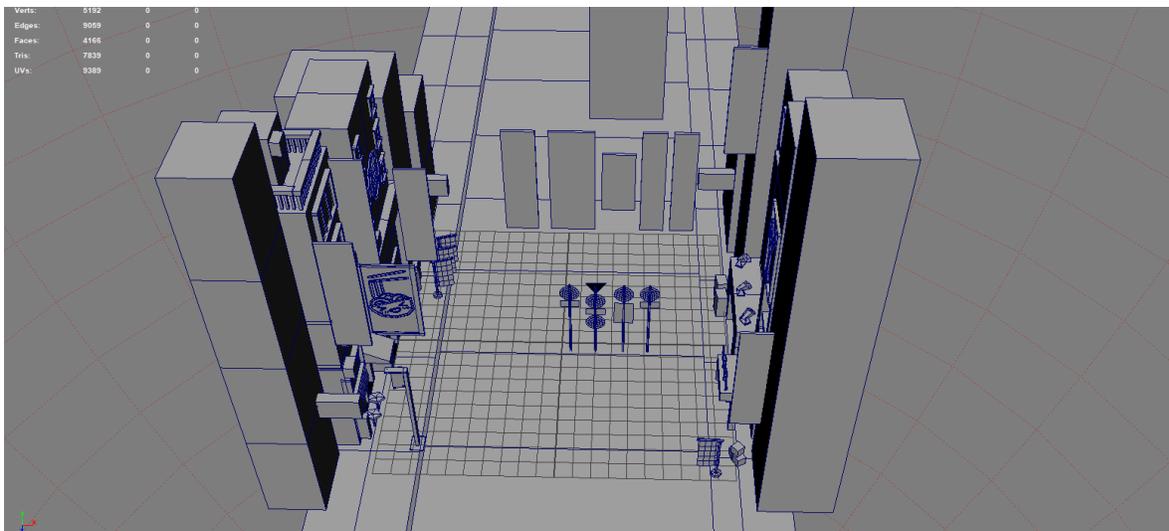
Lane 3(in game)



Lane 1 ( ingame)



## Building textures



## Building model

Lighting, Material, Models, Textures, Post Processing,

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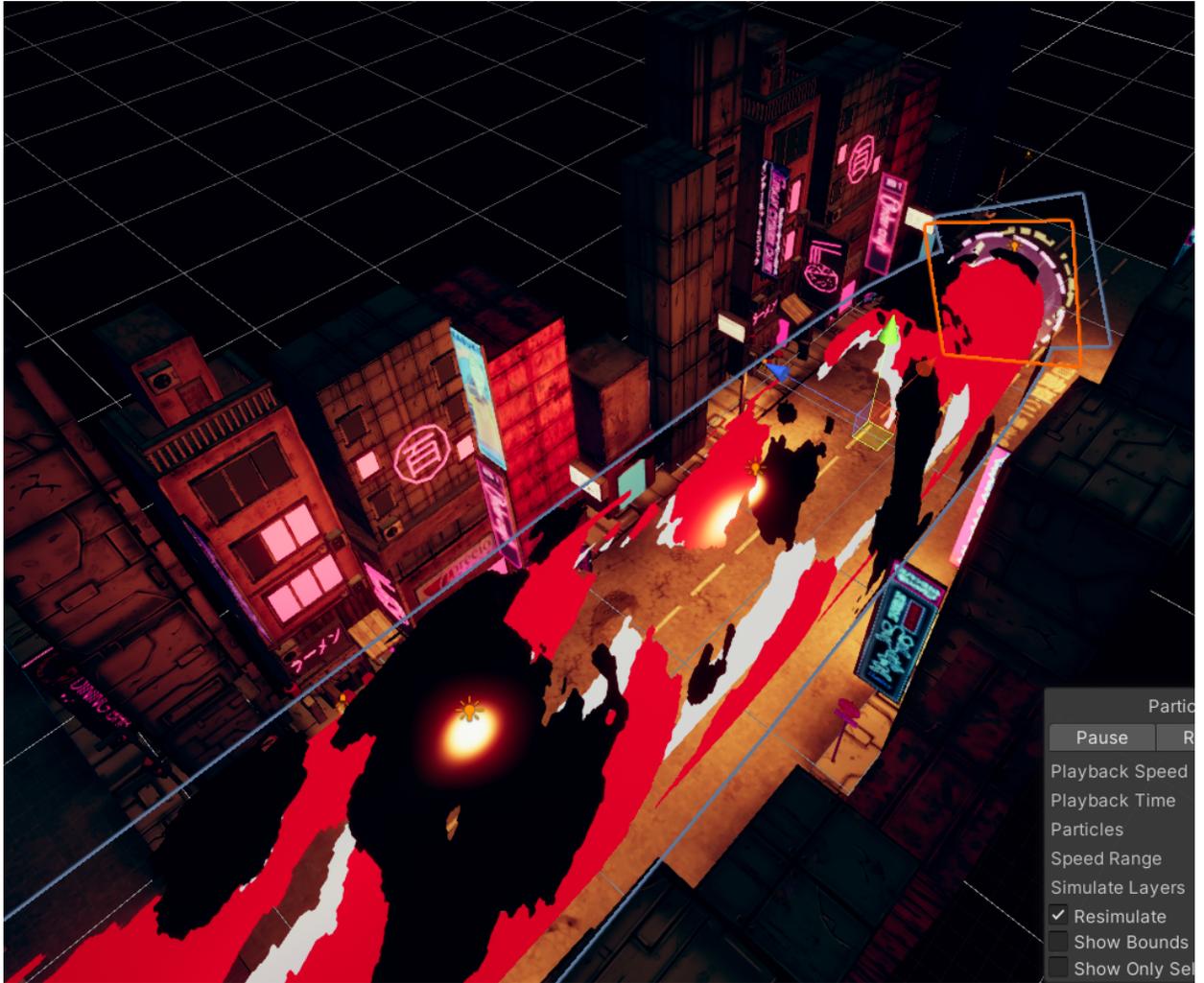
## V. UI Style / Design

UI sprites, animated sprites if any such as button glow/highlight

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## VI. VFX Design

Textures, Particle system, shader graph



# Team Profile

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## I. Team Introduction

### - Team Members

<b>Name:</b>	<b>Role:</b>
Dean Tan Wei Jie	Team Lead
Leong Yi Zhi, Michael	Programming Lead
Lee Jia Rui	Programmer
Low Zheng Yin, Ian	Art / Design Lead
Tan Jing Kang Aidan	Artist
Rayan Tan Yong Chang	Artist

### - Backgrounds and Experience

#### Previous Genres of Games worked on

Scram: Infinite Runner, Side Scroller, Mobile, 2D, Choices Matter, Cyberpunk, Singleplayer

Demon Ascension: 2D, RPG, Side Scroller, Action, Souls Like, Platformer, PC Windows, Hack and Slash

Despair: 2D, Side Scroller, Platformer, Sci-fi, Physics-based, PC Windows, Puzzle

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## II. Team Strengths and Weaknesses

### - Programming

#### Strengths:

- Bug-Testing
- Sound Sourcing
- Modularization
- Optimisation
- Organisation
- Scripting Knowledge and Application

**Weaknesses:**

- **Balancing**
- **Bug Fixing**
- **Inexperience**
- **Lack of exposure**
- **Fine tuning**

- **Art**

**Strengths:**

- **3D Modelling**
- **2D Texturing**
- **Lighting**
- **Creativity**
- **Communication**

**Weaknesses:**

- **Disorganised**
- **Bad Naming Convention**
- **Bad Versioning**
- **Animation**

# Playtest Report Summary

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## **Post Alpha Build 1.4 Summary**

### **Average Difficulty Rating:**

4/5

0 - Too easy

5 - Too challenging

### **Average Rating of Game Flow:**

4/5

0 - Gameplay does not flows well

5 - Gameplay flows well

### **Average rating of how refined the game is:**

4/5

0 - Not refined

5 - Polished

### **Average Visual Appeal of Game:**

5/5

0 - Distracting and too much going on

5 - Very appealing visually

### **Types of bugs encountered:**

Placement, Enemies

### **List of Bugs:**

1. Tutorial is buggy after some UI interaction, and affects placement
2. Level 1 & 2 cant place turrets during preparation phase
3. Retry button does not work

### **Feedback on Art and Visuals:**

1. Aesthetic is good, though the Japanese cyberpunk does look weird with the scifi aesthetic UI
2. Font Sizes could be much bigger

### **Other Feedback:**

1. Tutorial should explain the mini map & only introduce defending a second lane after the player learns to defend 1 lane.
2. Have an indicator for when the enemies enter your core
3. Include Turret Descriptions to be available when hotkeys are used to select.

4. Pause and Speed Button is redundant
5. The sound effects can be better used by changing them slightly
6. Look for more soothing projectile sounds or make them less jarring as they will be played often.
7. No option to restart level

## **Beta Build 1.0 Summary**

### **Average Difficulty Rating:**

4.2/5

0 - Too easy

5 - Too challenging

### **Average Rating of Game Flow :**

3.82/5

0 - Gameplay does not flow well

5 - Gameplay flows well

### **Average rating of how refined the game is:**

4.14/5

0 - Not refined

5 - Polished

### **Average Visual Appeal of Game:**

4.14/5

0 - Distracting and too much going on

5 - Very appealing visually

### **Types of bugs encountered:**

Placement, UI, Loading Screen, Turrets

### **List of Bugs:**

1. The loading screen hangs upon any reloading or loading of a scene 1/10 times
2. Upgrade Sell UI Layer is on top of the lose and win game screens
3. Some turret descriptions do not appear when you click a placed turret, such as the Snipers
4. Selling Blocks reduce turret count
5. Some turrets can target other lanes due to their range

### **Feedback on Art and Visuals:**

1. Background looks like a 2D Optical Illusion
2. The health bar of the enemies need to be a more saturated color so that the player can see it better against the neon lights.
3. Hard to differentiate things due to the lighting
4. VFX and Lighting feel unpolished right now

5. Colors of enemies and the roads blend together at times

### Other Feedback:

1. Tutorial should explain how to exit placement mode
2. Make it so that the player exits placement mode upon opening a radial menu
3. Explain or detail the enemy types
4. Loading Screen breaks up a lot of the gameflow, but otherwise the gameplay is fun
5. Add a range indicator for the turrets
6. Level 2 is too hard right now, but otherwise everything else is fun and balanced
7. It feels satisfying to complete Level 1
8. Add more indicators to where the enemies will come from and which tile
9. Add specific control for the camera in the form of WASD or arrow keys to move camera
10. Level 1 has a big difficulty spike
11. The game is hard and addictive, but the tutorial is too wordy.
12. The game has a simple concept and freedom of placement, but is strategically hard and fun when it comes down to execution as there are many ways to experiment.

## References

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### Music Citations and References:

#### - Fonts

M., Khalid. 2021. Monocode DEMO font. [online] Available at: <https://gumroad.com/l/MonocodeDEMO> [Accessed 18/2/2021]

#### - Sound Effects

2021. *BUTTON Distinct (mono)*. [online] Imphenzia.

2021. *ALARM Distorted Echo (loop stereo)*. [online] Imphenzia.

2021. *ALARM Fast High Pitch Echo (loop stereo)*. [online] Imphenzia.

2021. *BUTTON Medium Click (mono)*. [online] Imphenzia.

2021. *BUTTON Spring Press (mono)*. [online] Imphenzia.

#### - Music

Matyas, E., 2021. *Young-Visionaries\_Looping*. [online] Available at: <<http://www.soundimage.org>> [Accessed 18 February 2021].

Matyas, E., 2021. *Beepage\_Looping*. [online] Available at: <<http://www.soundimage.org>> [Accessed 18 February 2021].

Matyas, E., 2021. *Runaway\_Development*. [online] Available at: <<http://www.soundimage.org>> [Accessed 18 February 2021].

- I. This is the end document reference list that is required for your in-text references
- II. You are required to use either Harvard, APA style (where applicable)

# Appendix

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## **I. Asset List - Art**

### **Model and texture list**

**Turret Models**

**Turret Normals**

**Turret Emission**

**Turret Diffuse**

**Turret Bump Maps**

**Background Props Models**

**Background Props Diffuse**

**Background Props Bump Maps**

**Background Props Emission**

**Mob Normals**

**Mob Diffuse**

**Mob Emission**

### **Animation List**

**Turrets Shooting Animations**

**Enemies Movement Animations**

**Boss Idle Animations**

**Main Menu Animations**

### **Visual Effects List**

**Boss Attack Charge**

**Boss Attack Fire**

**Turret Placement Smoke**

**Explosions(planned)**

**Slowing Field(planned)**

**Lighting (Post Processing)**

**Light (Emission)**

**Lighting (Reflection Probe)**

**Normal Unity Lighting**

**Lighting (Volume) (Planned)**

## **Volumetric Fog (Planned)**

**UI Interface art list**

**Cannon Turret Button**

**Sniper Turret Button**

**Rocket Turret Button**

**Slow Turret Button**

**Wall Block Button**

**UI Resource Indicator Icons**

**Pause Button**

**Speed Button**

**Next Wave Button**

**Pause Menu/Victory Menu/Defeat Menu/Main Menu Buttons**

**Red Lane Indicator Glow**

**UI Panels**

**UI Font**

**Minimap/Radar Assets**

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## **II. Asset List - Sound and Music**

**Interface sounds**

**Button Press Sound**

**Turret Select Sound**

**Main Menu Music**

**Ambient**

**Level Standby Phase Music**

**Level Wave Phase Music**

**Action**

**Turret Deploy Sound**

**Turret Sell Sound**

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### III. Asset List - (In-game text)

#### - Tutorial Text

1. Thank you for coming, we'll give you a quick explanation as we go about what we have access to.
2. The buttons on the right of your display deploy turrets our engineers have set up. You'll get a preview of where will be placed before confirmation.
3. Press 1 or this button. This will allow you to deploy a Cannon Turret. This is the most basic turret, which is cost efficient and cheap.
4. Press 2 or this button. This will allow you to deploy a Sniper Turret. It costs more, but boasts high damage and range at the cost of fire speed.
5. Press 3 or this button to deploy a Rocket Turret. This costs a large amount, but has area damage capabilities, and is generally useful if used well.
6. Press 4 or this button to deploy a Slowing Turret. It costs the same as the Rocket, and slows all enemies around it down, complementing other towers.
7. Press 5 or this button to deploy Blocks, allowing you to build longer paths for enemies to follow.
8. The 4 turret types have a limit on how many can be active at the same time, but the blocks do not. Keep that in mind when deploying units.
9. Above that is the core's health and the remaining power we can spend. The core's health is what we need to protect, and is lost when a robot goes past the bottom of your display.
10. Power is what you need to deploy and upgrade turrets. We can gain more from defeating the robots.
11. [If you need a moment to collect your thoughts or take a quick break, clicking the pause icon will pause the game, and inversely, if you wish to speed up the game, click the speed icon to change the game speed.]
12. In case you haven't realised, on the left, there's two panels above your health, core, and turret limit indicators. The leftmost one represents the number of "waves" the other cities have reported when they were attacked.
13. They're coming from multiple entry points, but we've managed to shut them off to 2 for now. Though, be warned that as time goes on, they will attack from more and more points. To view and move your camera, use Q and E.
14. If you lose your bearings, you can use the minimap in the top left corner to view which lane you are on, along with any information and locations of enemies we pick up on from the other lanes.

15. Aside from that...there's one last thing to mention. We've created prototypes of Upgrade modules for each turret, which improve various capabilities. They can greatly improve your firepower if you have hit the turret limit, but...
16. ...while an upgrade sounds good, one big downside is that the costs for activating said Upgrade Modules are also increased. As of right now, it is reported that the first upgrade will consume 150% of the original resource and 200% for the second. Be economical with our resources.
17. Now try pressing the Next Wave Button. Let's let the robots in before they break through our outer defenses, and use your turrets to manage this attack.

**Pre-wave text:**

- Robots incoming... Press 'Q' or 'E' to check different lanes!

**Turret Descriptions:**

**Cannon - Basic Cannon. Single Shot, Single Target.**

**Cannon Upgrade 1 - Upgraded Cannon, with more health, range, and a higher fire rate.**

**Cannon Upgrade 2 - The Final Form of the Cannon. Boosted Damage and Range.**

**Rocket - Basic Rocket. Has splash damage capabilities and a longer range., but a lower damage and fire rate.**

**Rocket Upgrade 1 - Upgraded Rocket. It's damage and range have been increased.**

**Rocket Upgrade 2 - Final Upgrade of the Rocket Launcher, it has double the fire rate, making it twice as powerful.**

**Slow - Multi-Target AoE, High Fire Speed, No Damage.**

**Slow Upgrade 1 - Upgraded Slow. It slows enemies at a faster rate.**

**Slow Upgrade 2 - The Final Form of the Slow. Slows enemies as long as they are within range.**

**Sniper - Single Target, Slow Fire Speed, Very High Damage.**

**Sniper Upgrade 1 - Upgraded Sniper. Deals significantly more damage.**

**Sniper Upgrade 2 - The Final Form of the Sniper. Deals extremely lethal damage per shot.**

**Blocker - No Description.**

**Mob Descriptions:**

**Little Boy - The most common Robots that are found. They are the weakest but usually appear in large numbers.**

**Little Boy+ - These are the more dangerous form of the most common Robots that are found. They are no longer weak but still usually appear in large numbers. They are also faster than its common variant.**

**Fat Man - Compared to the common Robots, they are tankier but slower.**

**Fat Man+ - These upgraded versions of the tankier Robots do not come with the drawback of being slower as a result of their armor.**

**Tsar Bomba - The Big Boss of the Robots. Extremely dangerous and can fire off laser shots that destroy turrets. It is unable to stay on the field for extended periods of time.**