

RVJ

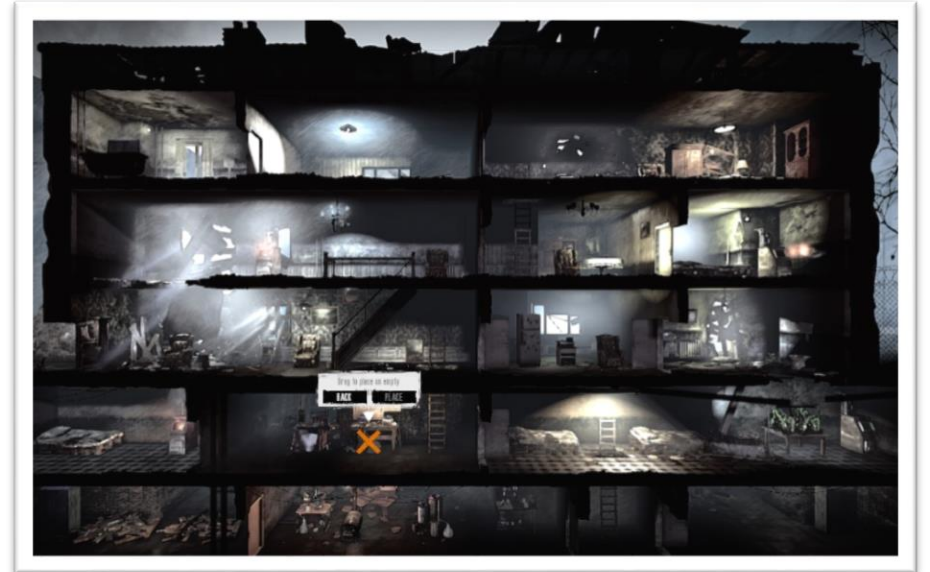
# Brief

The game is called Death Machines. It's a single player and multiplayer vehicle death match for PC. The players has to defend their modified scrap vehicles and survive to win a game. The events will take place in a controlled closed course and be powered with powerups which can be used to attack or defend from enemies. Powerups should be taken strategically depending on ones vehicle modification. The main goal of the race is to become the last one standing. Better rewards will be awarded for the higher hit and defend points.

CONCEPT IDEAS

# Concept #1

- Game name : The sad war
- Genre : Survival platformer
- Age target : 14+
- About the game : Find food, help others and survive inside an apartment during the war.
- Why I didn't select : I wanted to create a 3D game and when compared to my other concepts, the gameplay was lacking.



# Concept #2

- Game name : Car golf
- Genre : Sports
- Age target : 10+
- About the game : Using small cars to put the ball in the hole.
- Why I didn't select : Game was pretty basic and probably boring and I wanted to create a good 3D vehicle game.



# Concept #3

- Game name : Space survival game
- Genre : Survival, action
- Age target : 14+
- About the game : Fight off enemy space ship and play with the story.
- Why I didn't select : Story was not that great and with the realese of games like star citizen, I dont think this game would be a success in that regard.



# Concept #4

- Game name : Bus Sim : Dangerous roads
- Genre : Simulation
- Age target : 14+
- About the game : Deliver passengers safely through narrow and dangerous roads.
- Why I didn't select : The driving physics had to be realistic but that will be hard or not possible to do since i'm not great at programming.



# Concept #5

- Game name : Death Rally
- Genre : Survival racing
- Age target : 17+
- About the game : Survive the race using your deadly weapons and armours to win the championships.





# Why I chose the final concept

- I love driving games so making these kind of games will get me a better opportunities at companies like SUMO.
- I have always wanted to make a driving game when I used to play games like Need For Speed Most Wanted 2005, Burnout Paradise, etc.
- I only played driving games before but lately i'm enjoying shooting games too.
- For this reason, I decided to mix both of these genres together and make a unique game.
- While comparing with my other game ideas, this game has much more unique features.
- All of my other concepts have similar games already made. The final concept is more unique compared to the others.

# Why I chose the final concept

- It is the best game from my concepts because the game will be action packed and will need to play strategically to win the championships.
- The player could either play hide and seek, or go full war mode. This gives the player a choice and the gameplay will be different for different stages.
- There are similar games namely Split Second, Death Race, Blur, Mad Max, Crossout but my concept will have unique features and I will implement some of the more common features from these games.
- This is something I have always wanted to do. And even though it will be hard to finish in the given time, I'll try my best.

USP

# Unique Selling Point

- Mixing shooting with driving is a unique approach and there will be players from both shooting as well as driving games.
- Modifying different vehicle differently will make each gameplay different and everyone will have a unique vehicle weapon combination.
- The players can group up and destroy other enemies but eventually will have to turn sides and destroy each other.

# REFERENCES

# Death Race (Movie)

- The main inspiration is from the movie death race.
- I have always wanted to play a game like it but unfortunately there was none that was exactly like it.
- Framed for a murder he did not commit, Jensen Ames finds himself at Terminal Island, the country's toughest prison, but he gets an unexpected chance at freedom when the warden offers a choice
- Compete in the Death Race as a mythical driver called Frankenstein, or rot in a cell forever.
- Driving in a car equipped with flamethrowers and grenade launchers, Ames must survive a gauntlet of vicious criminals to win his freedom or die trying.

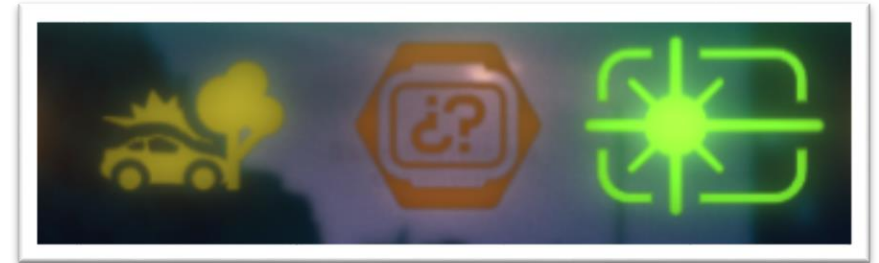


# Death Race (Movie) - Deconstruction

- Surviving is more important than winning.
- Races will eliminate whoever comes last.
- Each vehicles in the movie are different.
- There are Sedans, Muscle cars, Pickup Trucks, and Semi Trucks.
- The opponents can modify their vehicle however they want with the limited resources.

# Blur

- I took some ideas from the games such as the use of powerup slots from blur.
- Travel the globe from L.A. and San Francisco to Spain, the UK and more to take on the best the streets have to offer. Utilize power-ups like nitro speed boosts, shock attacks, defensive shields, and landmines to beat your rivals across the finish line.
- You choose how and when to use your armory of Power-ups for ultimate impact in a race where the outcome is never certain.
- Blur's story unfolds through a unique community based social network interface that includes 4 player split-screen multiplayer and online multiplayer.





# Blur - Deconstruction

- The game has a lot of vehicle variety.
- Vehicles are differentiated by class, namely A, B, C and D.
- Each class has a diversified licensed vehicles to choose from.
- All the vehicles are balanced. That is for example, if a car is faster, it will have less health and if a car is slower, it will have more health but less speed. For this, choosing the right car for the map is important.
- The game takes place in a closed roads and has some famous real life landmarks.
- Players have to finish 1<sup>st</sup> to win the game. Damaging or wrecking enemies increases the points and fans.
- There will be powerups on the roads and the player will have the choice to choose which one they want.
- The choice of powerups is very important to win a game.

# Split/Second

- I got inspired to make the environment destruction from split second.
- Split/Second, an intense action racing game set within the world of a hyper-competitive reality television show.
- Competitors vie to be the first across the finish line in a made-for-TV city built for destruction, with the ultimate goal of becoming the season champion.
- Competitors in Split/Second don't just collide with other vehicles to knock them from the track. They can also trigger explosive events that drastically alter the dynamics of the race.
- Players must use strategy and pinpoint timing to derail opponents, tactically alter the track or create entirely new routes.



# Split/Second – Deconstruction

- Racing game with powerups.
- First one to cross the finish line wins.
- Powerups are gained by doing drafting, drifting, close calls, etc.
- Powerups can be used to wreck enemy players in front by ways of environment destruction.
- Powerups are divided into 3 sections. Each can be used for wrecking enemies.
- Saving up powerups are also useful. Once the three powerups are all acquired, the player can use a much more powerful way to wreck enemies.
- This makes strategy important as well when racing.
- Environment destruction is a unique feature in this game.

# Crossout

- The vehicle modifications style, I got from crossout where you are free to attach a mod wherever you want.
- Crossout is the post-apocalyptic MMO Action game.
- Players can craft their unique battle machines from dozens of interchangeable parts, ride them directly into combat and destroy your enemies in explosive PvP online battles.



# Crossout - Deconstruction

- The game is an 8v8 vehicle deathmatch.
- Player can build their vehicle however they want from the ground up.
- The unique feature in the game is the modification system.
- It can even change the multiplayer gameplay depending on how the vehicle is modified.
- Skill, strategy and teamwork are the most important factors in this game.
- The players has to unlock modification such as weapons and shields to equip them.
- Once the team destroys everyone in the other team, they win.
- There is also a feature where the players can combine their vehicles to make into a stronger one.
- The game is free but there are paid unlockables to upgrade their vehicles.



# Mad Max

- The idea of using scraps and the extensive vehicle features I got inspired from Mad Max.
- The game is primarily focused on open-world car combat/racing, but also features on-foot combat similar to the Batman Arkham series.
- Vehicles in the game will be heavily customizable, and feature many parts to upgrade via collecting scrap found in the world and collected from enemies.
- Car combat will involve doing enough damage to the car to destroy it, or taking out the driver after peeling away enough of the car's armor to get at them.
- Enemy cars defeated in this way can be captured and driven by the player



# Mad Max - Deconstruction

- Mad Max is a single player story based game.
- The players has to survive in a post apocalyptic wasteland and defeat a warlord
- The game has a progression system which urges the player to complete one by one to increase their rank.
- Scraps are the wastelands currency to upgrade the players looks, armour, weapons, combact moves, ect.
- Scraps are also used for vehicle upgrades like armour, weapons, harpoons, nitrox, ect.
- The player can take down enemy convoys to gain rank, scraps, ect if the vehicle is strong enough.
- A lot of stratergy is required to take down something at a much higher rank.
- Players has to keep drinking water, fuel the vehicle, ect to survive.

RESEARCH



# Game Genre

- I wanted to create a driving game at first.
- It needed something unique from other driving games.
- I got inspired from the movie “Death Race” and so I decided to create a similar game.
- I decided to add weapons and shields to the vehicles.
- There are similar games out there with similar genre (racing survival) so I instead of racing, I decided to create a death match game mode as the main game.
- So the game genre is vehicle death match.



# Target Audience

- I researched on what type of audience plays video games similar to mine.
- My concept contains both racing as well as shooting.
- The game is arcade with good graphics and it's not a serious game.
- From my research, popular racing games like Forza and Need for speed are mostly played by teenagers. What this means is that, usually teenage gamers are looking for fun racing and not anything serious like Assetto Corsa or Rfactor 2 or any of the simulators.
- Since it's not a serious game, the target audience would be less than 20 year olds.
- The game would be most enjoyable for teen gamers who mainly like driving games. Some gamers with shooting genre at their interest would also like the game.
- For this reason, I set my target audience 'Teen'.
- For this reason, the game is going to be arcade with similar physics to forza series.



# Goal and Objectives

- I played some of the similar racing survival games like blur, split second, etc.
- From those games I got some idea on what to set as a main goal and objectives.
- The main goal is to survive and become the last player standing.
- I got this idea from the game Wreckfest.
- For the objectives, I got some from Mad Max and I created some myself.
- Destroy or damage enemy opponents, shield against enemy opponents.
- Collecting scraps, creating traps, modifying vehicles are also mini objectives that need to be done to progress the game.



# Content Ratings

- For the content ratings, I had to research a lot on similar games and their content ratings to get an idea on how it's given.
- I checked both ESRB and PEGI rating boards ratings on teen audience targeted games.
- Games like Blur and Split/Second had ESRB Everyone 10+ while games like Mad Max had ESRB Mature 17+. This is due to the game having realistic blood and violence in the fight scenes.
- My game won't have any of those and can be considered similar to Blur.
- For these reasons, I decided to give it a rating of ESRB Everyone 10+.



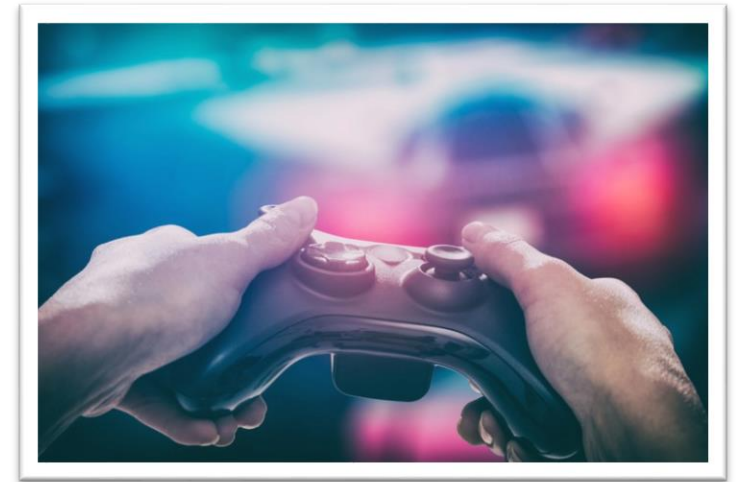
# USP

- From my previous gaming experiences, I have found that the ability to personalise one's vehicle is an important and a big factor and can be a reason for the success of a game.
- For this reason, I will make my the vehicles customizable in my game. Other than cosmetic upgrades like paints, bumpers, etc., I have decided to modify the weapons and shield systems on every vehicle to make it different. This will also change the gameplay.
- Every player will be balanced by limiting the modifications by a point system. There for skill and strategy is very important to win a game.



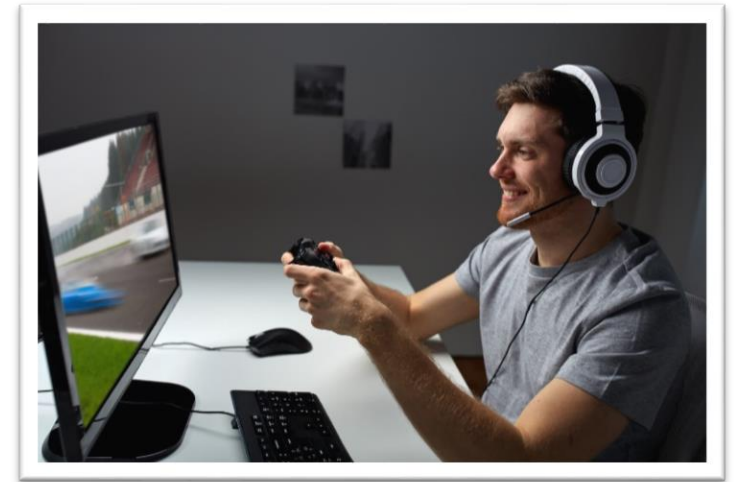
# Core Gameplay

- I researched on the gameplay aspects and implemented some features from similar games.
- Players have to drive their own vehicle bought using scraps and defeat the opponents.
- The game will start in a closed area with 10 vehicles in total.
- There will be attacking and shielding features in every game. Players have to use these elements to gain chances of survival until there is only one player surviving.
- There are no penalty systems in the game so players can use whatever it takes to take down an opponent.
- From 'attack' or 'defend', only one can be taken at a particular time so the players have to play strategically to win a game.



# Player Experience

- The main goal of this game is to have fun and not serious so the difficulty is on the lenient side.
- The difficulty will slowly increase as the player modify their vehicles.
- Players will have the urge to win the game with minimum damage taken since damage will have to be repaired for the next event.
- When playing in multiplayer mode, the players will feel competitive.
- Player will also use tactics to trap the enemies.



# Player Motivation

- Repairing vehicles after a race makes the players to play more tactically for the next time since scraps are rare.
- Multiplayer game mode will let players play with friends and have fun.
- This will also change how every game is played.
- Vehicle modification allows the players to create their own personalised vehicle.
- Currency system is scraps as well as money in the game and it is scarce.
- This will motivate players to play much more, save up and buy vehicles.

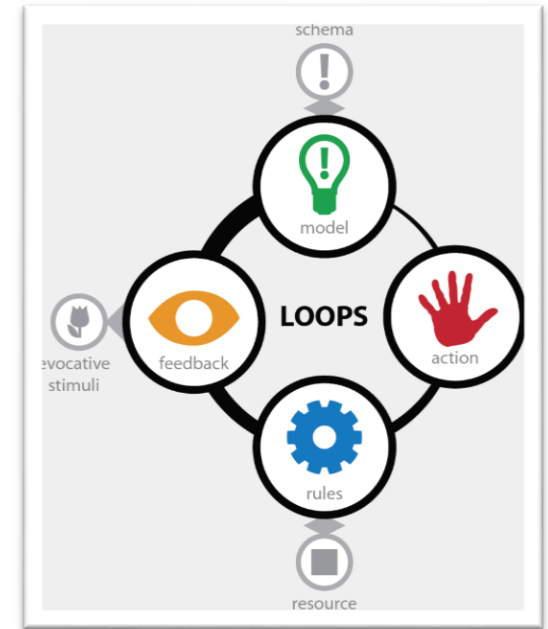


# Gameplay

- The game will start in a closed area with 10 vehicles in total.
- The last one surviving wins a game so players attack and defend from one another till finally there is only one player left.
- On an event, there would be activators which you should drive on to activate one of your power.
- The game is single player and lan multiplayer.
- Scraps are collectibles that can be used for modifications on your vehicle which can be earned by beating opponents.
- There will be 3 slots to modify the cars in the game (including both attack and defend).
- The way you set your car is important as this will be the what differentiates you from the others.
- There will be multiple weather systems which will affect the handling of the cars.
- Internal modifications include engine swap, forced induction ect which doesnt take any slots.
- Attack modifications include spike strip, guns, gas tank drop. Defend modifications include lightbar, shield, emp.

# Core Loop of the Game

- At first, the player will be given a small amount of scraps to buy the first vehicle.
- The player should enter a demolition event next and survive.
- If won, scraps will be awarded according to the finishing position.
- Higher the position, higher the amount of scraps.
- The player can repair, modify, or even buy new vehicles with enough scraps.
- Once the player has equipped with weapons and shields, they have to choose the powers to use before getting on an event.
- If won first, there would be a cash price which can be used for research of better weapon and shield systems.
- Modifying vehicles higher will make the AI also harder which will keep the difficulty part up.

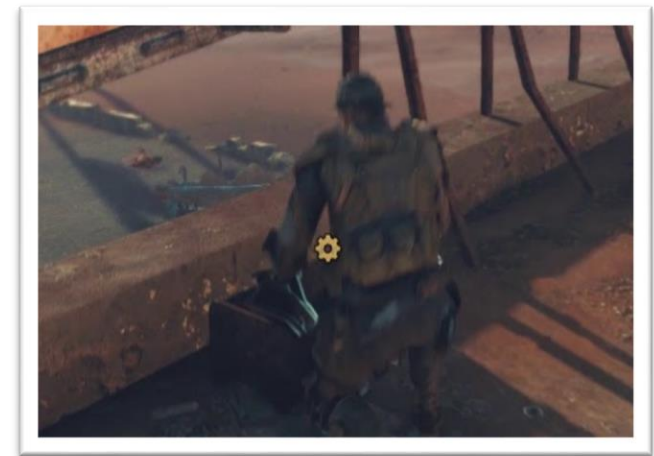


# Core Mechanics

- I researched on the core mechanics of similar games, and other games as well to get an idea on what is important and what is not.
- The core mechanic of my concept is to survive.
- This is because my game has greater importance to survival than winning.
- If the players do not manage to survive, their vehicles will get wrecked and it will take much scraps to repair and rebuild.
- This might not seem balanced gameplay but every enemy takedown will earn scraps to make it balanced.

# Game Collectables

- Scraps are the main collectibles in the game.
- I came to use scraps as a main collectible after researching on racing games and their collectibles.
- This idea is taken from the game 'Mad Max' where scraps are used as currency.
- Scraps can be used to repair, modify or even buy used vehicles.
- Scraps are usually earned at the end of a round depending on the finishing position.
- Scraps are found as collectables in game.
- Usually hidden at secret locations on the maps.
- This is to encourage the players to hunt for scraps mid event as a secondary quest.
- It is high reward but high risk also since most of the enemy players will be near them.
- There would also be rare health drops which would repair the vehicle to a certain extend.



# Game Camera View

- Since the game is targeted at teen audience, I found out that most teens prefer third person to first person.
- This is because even though first person is much more immersive, third person perspective gives a larger field of view on what's going around the player.
- More than realism, fun factor is given importance here.
- The camera will be set in a way it follows the car and can be rotated at anytime using the mouse or right stick in controllers.
- There won't be a first person camera in game.
- There will be a hood, bumper, back and third person camera in total.



# Game Camera Movement and Effects

- The third person camera will have damping effects when slowing down, accelerating, or when turning for a smooth camera movement.
- Other cameras won't be having damping effects since from my research, it will be hard to control the vehicle if these cameras keep moving from the vehicle.
- I checked mainly Split/Second game for camera effects because when I played it, I really enjoyed the effects.
- From that I decided my game will have effects like camera shake on collision to give better immersion, depth of field for greater visual effect and motion blur so that the sense of speed is increased.
- The game will also have wide camera field of view.

# Level Mechanics

- I wanted an abandoned and realistic feel to the level to give a more negative feel to the level to make it match with the gameplay.
- There will be multiple levels, each taking place at different places.
- Levels will be unlocked with experience.
- I decided which all places to select by refering to some of the other racing game environments.
- I liked the shipyard from Blur, the wastelands from Mad Max and got some ideas from other games too.
- The level is changed randomly once a player wins an event.
- Other than playing an objective, I wanted the players to explore the levels so there will be multiple secret locations on each level.
- Players can modify their vehicles and it will become much harder for the new players to win the races so I had to balance this.
- To make the game balanced, there will be a bonous to whoever takes down the higher ranked players.

# Health and Life System

- There would be a damage counter showing the percentage of damage taken by the vehicle.
- Each damage taken has to be repaired after the races using scraps.
- If the damage level reaches 100%, the player would be considered as DNF for the race.
- Once the damage level reaches maximum, the vehicle would be considered a wreck and repairing would take much more scraps.
- There will be health drops randomly appearing in the area so that players have a better chance of surviving even if they are heavily damaged.



# Reward System

- Rewards will can be aquired even if a player didn't win the game but it will be much lower.
- This will make players wanting to finish higher and survive longer.
- Player experience is increased with hitpoints, enemies taken down and with time.
- There will also be a 2x experience multipler if a player wins a game.
- Scraps are also awarded to the players depending on their score at the end of a game.
- There will also be ingame money reward for the podium finishes.
- With experience, players are leveled up.

# Control Schemes

- The game will support keyboard and mouse, joysticks and possibly wheels too.
- Games like Forza Horizon 4 are optimized and intended to be played with a joystick but they support driving wheels too.
- From my experience eventhough I maybe slower with a wheel (since it's not optimised properly), I enjoy much more while playing with a wheel.
- For this reason I plan on giving support for wheel sets since it will be much more fun with it.
- But i'm still not sure if its feasible with my knowledge in coding.
- Therefore the game won't have support for driving wheel sets at release but I do plan on implementing it after the release.
- For keyboards players, the camera can be rotated using the mouse and for joystick players it can be mapped to the right stick.



# Game Audio Design

- I have no experience in creating or designing audio.
- For this reason, I'm going to download free to use audio or get audio effects with permission from the right authors.
- The game background music will be EDM (electronic dance music) mixed with some slow rock.
- Games like Blur uses slow EDM music but I think trap and rock will fit perfectly for my game.
- The SFX will be there for when crashing, tyre screeching, shooting, engine sounds, ect.
- At first I was not planing on using SFX for UI interactions since there is background music but after refering some games like Need For Speed Payback, I found out that it is much better with them.

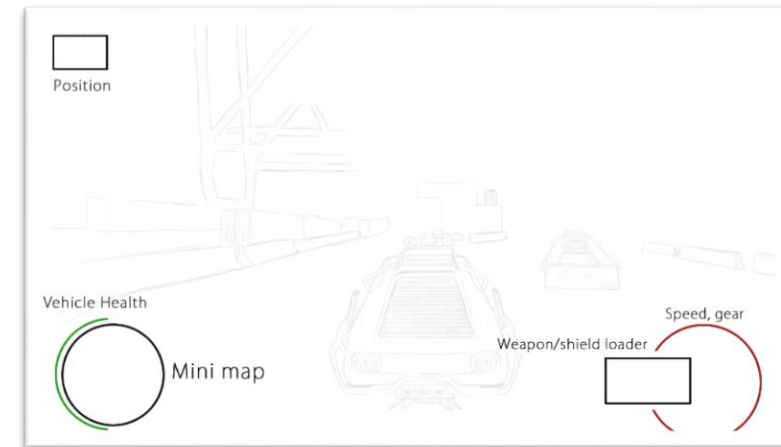
# Game Art

- The artstyle would be realistic.
- The game would take place at abandoned places.
- Most of the props would be dirty, covered with rust and moss to give an old look.
- Some of the environment would be an abandoned airport, shipyard, industrial area, etc.
- From my research, usually games with post apocalyptic environments use warm colours much more than cool colours and games with futuristic environments would be cool coloured.
- For this reason the game visuals would be mostly warm coloured.
- Post processing effects such as DOF and motion blur will be added to get better visual effects.
- Smoke generation when the vehicle tyre loses traction will be implemented for realism and the cool factor.



# Game HUD

- Before deciding on what all should be there, I researched on similar games and their HUDs.
- I wanted to keep the HUD to a minimum but I found out that arcade games targetting this age group specifically doesn't keep the HUD to a minimum.
- Most of these games had pop up HUD while performing and completing specific tasks like drifting, crashing ect.
- What I understood was that if a game focuses more on the fun factor than the realism, the HUD don't need to be kept at a minimum for the immersion.
- There would be position, time taken, damage taken, weapon/shield selector, speed and rpm as HUD.



# Project Details

- First I will release the prototype on 10<sup>th</sup> January 2019.
- Followed by the that will be the beta version which will have 2 vehicles to choose from, 1 enemy and a player.
- There will only be one location to choose from for the beta version. The game would finish as soon as the player destroys the enemy player.
- For the beta version, weapons and shields will be added and light modification would also be added.
- The scrap system would also be implemented on the beta version.
- The final game will have the support for multiplayer and full vehicle modification.
- More DLCs, game modes and driving wheel support are planned to be released after the golden release.

# Marketing

- From my experiences from watching youtube, I have realised that a lot of indie game companies give out their games to popular youtubers and reviewers.
- What this does is that it is a free spotlight to the game.
- There are also other companies that advertise on various platform.
- I will give my game out to popular youtubers since that is the best budget oriented way to make more people aware of the game.
- The game has to be tested and perfect before sending the game.
- The game will be priced aggressively to appeal to new gamers.
- I will also be making blogs and pages in social media to get more audience that way.



# Technologies Used

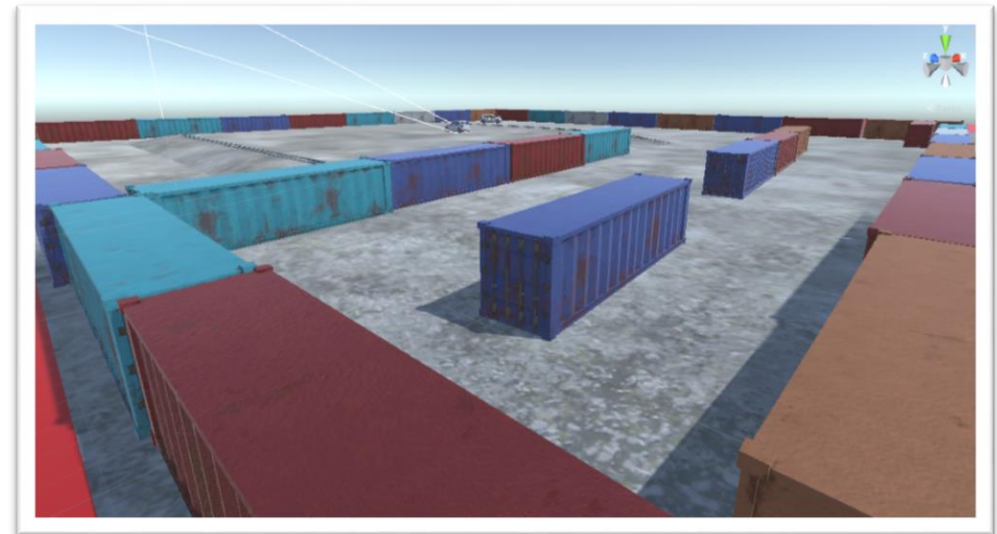
- I used Autodesk Maya 2017 to make all the models.
- I optimize the models, UV map them manually and export them into .FBX.
- The model is then imported into Allegorithmic Substance Painter 2018 to texture the models.
- Engine used for the game is Unity 2018.
- I also use Adobe Photoshop to colour correct the visuals when post processing.



PROTOTYPE

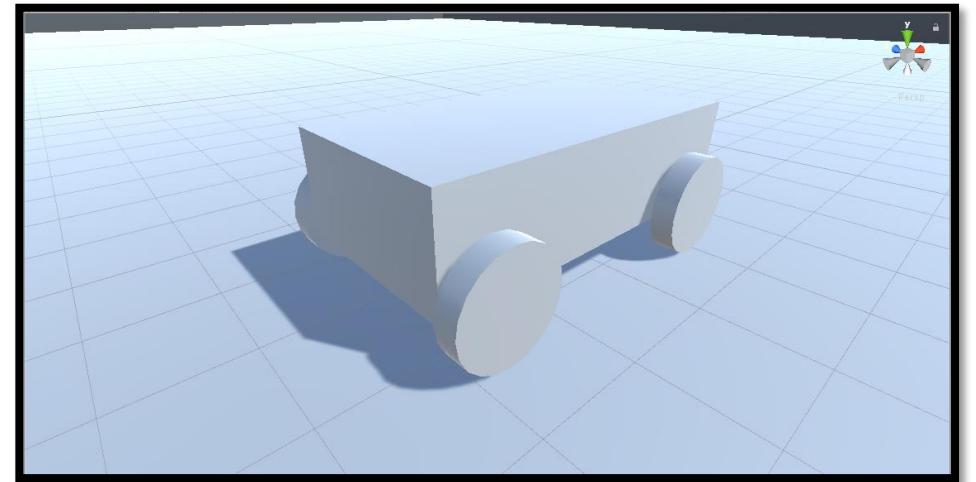
# Environment

- I used a plane as the platform and placed some shipping containers outside throughout the plane so that the car wouldn't fall down.
- At some places, the containers are placed in a maze pattern for the player to evade the enemies during gameplay.



# Vehicle

- For the vehicle, to start with I used a cube as the main body and four cylinders for the tyres.
- I used box colliders for the body.
- For the tyres, I used wheel colliders.
- I made the basic car controls next.
- The wheel turning feature was gotten by referring to some tutorials online.
- This was just a model for me just to test some thing out. Mainly the wheel turing feature.



# Vehicle

- Since the box vehicle worked properly, I decided to get some better free to use models online.
- This was just going to be used for the prototype and not the final game.
- I downloaded a couple of decent looking models.
- But once I imported them into the Unity project, some necessary parts for the movement of wheels were not separated.
- This meant I couldn't use these models.



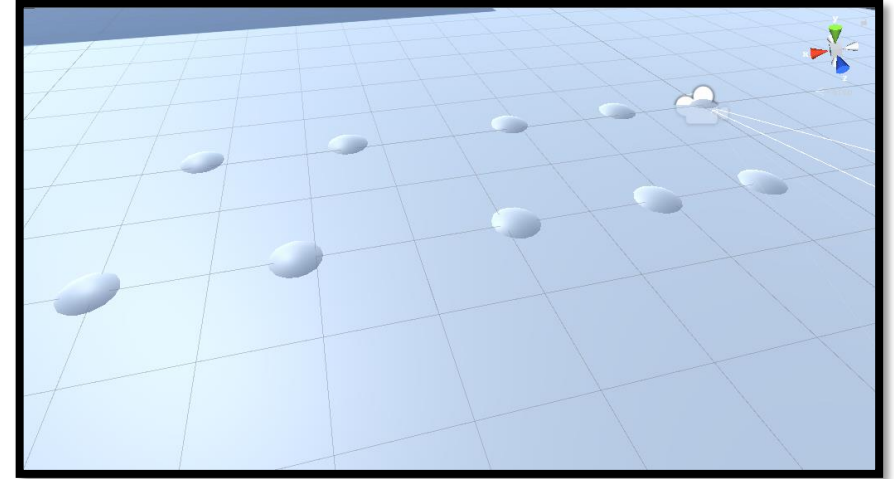
# Vehicle

- I finally got a proper model for the prototype.
- The car is a Golf hatchback.
- Eventhough the car in real life is front wheel drive, I decided to make it rear wheel drive.
- This was done so that the physics could be set better when the rear end of the car starts sliding.
- I added the wheel colliders to the wheel and made the car working.



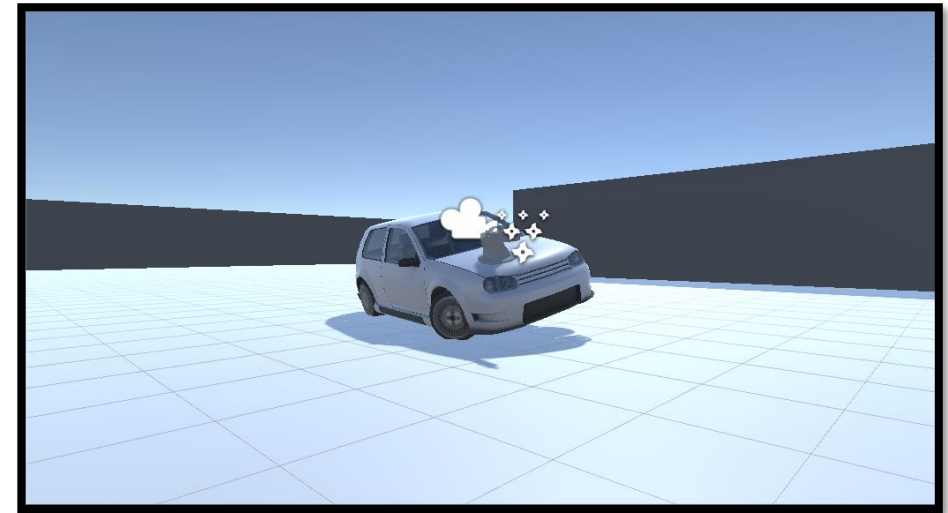
# Vehicle

- After the controls were done, I moved onto the car physics.
- The physics were hard to get when the car starts sliding but after hours of work, I got it kind of how I wanted.
- I also wanted the shock and dampers to work properly.
- For this, I created some spheres and placed them on the floor to act as bumps.
- I drove the car on them and adjusted the suspension settings.



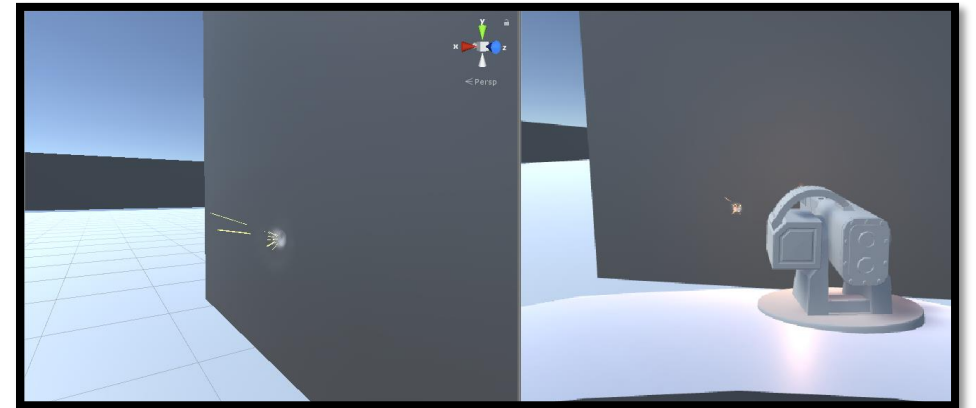
# Vehicle

- There was a big problem with the car when turning at medium to high speeds. The car was rolling over.
- I thought it was the suspension being too soft.
- I stiffened the suspension but the problem was still persisting.
- I asked some of my friends and they told me that the center of mass might be too high.
- I checked that but it was proper only.
- I checked again on the internet and found out that there should be a code for anti-roll bar just like in real life.
- So I made that code and the problem was fixed.



# Vehicle Weapons

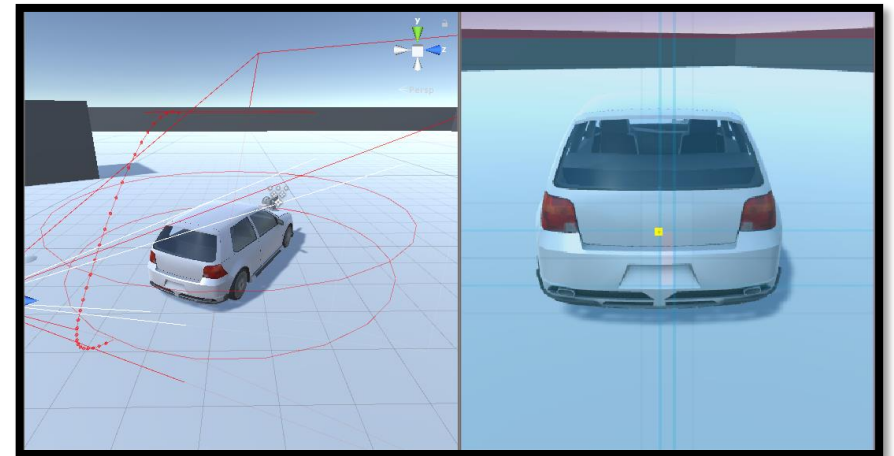
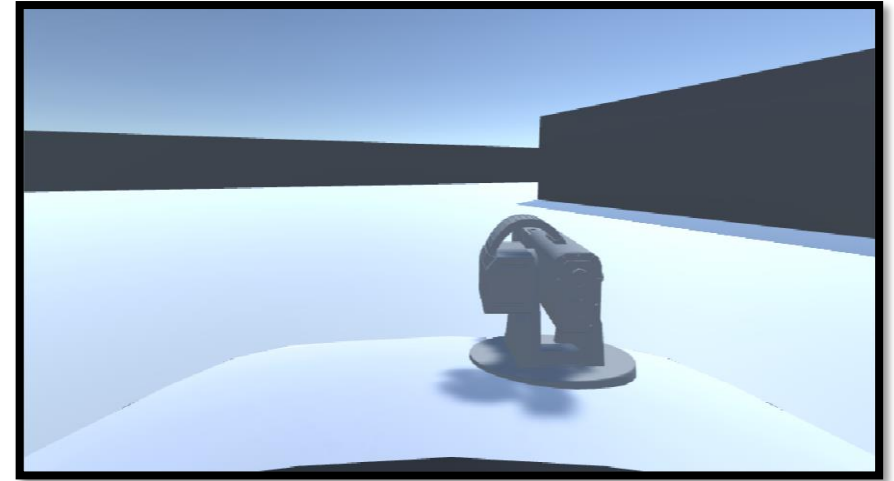
- For the weapon, I downloaded a free to use 3D model.
- This was for the prototype only and would be changed in the final game.
- I added weapon bullets and made them shoot.
- I also added particle system when firing and also when the bullet hits any mesh.
- To make it more optimised, I made the particles disappear after a certain amount of time.





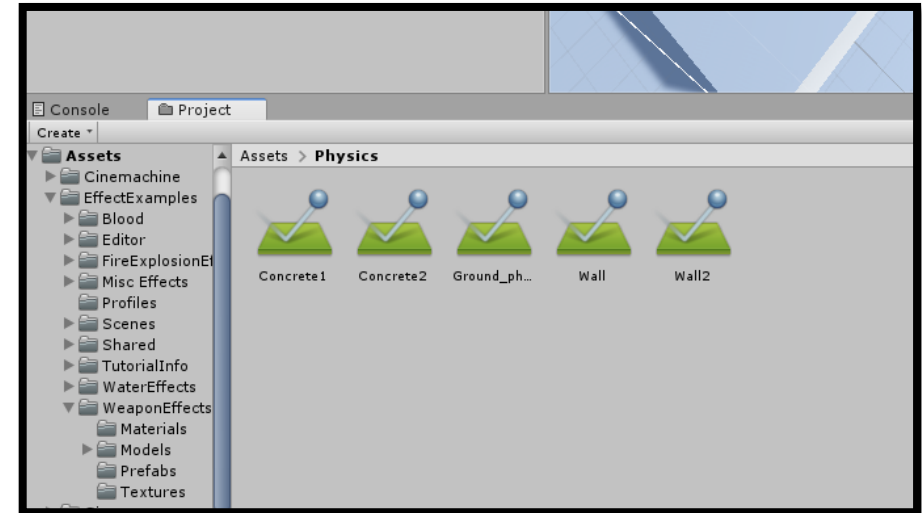
# Game Camera

- For the game camera I first made it first in hood view since it didn't take much time and would be playable from the start.
- After making the vehicle movements and the weapon system, I installed Cinemachine from the store.
- Cinemachine was pretty easy to work with.
- There is still a problem persisting with the camera where the vehicle turns but camera doesn't turn fast enough.



# Physics Materials

- I created different physics materials for different cubes.
- This was to make the crash physics more realistic compared to using the same for every assets.
- I created two concrete physics and 2 wall physics representing metallic objects.
- I also created a ground physics representing tar, and applied the value after researching on the web.



# What I learned

- Basic vehicle controls in Unity
- Proper way to set up a vehicle in the hierarchy in Unity
- Vehicle tyre rotation and steering in Unity
- Target particle system when shooting in Unity
- Use of Anti-roll bars in Unity
- Using Cinemachine camera tool in Unity
- Tweaking car suspension and physics in Unity
- Understanding C# coding better

# Problems Faced and their Solutions

- Vehicle's wheel colliders not working properly.
- This was fixed by downloading a proper 3D model.
- Braking power being too low.
- This was fixed by adjusting the material physics settings.
- Vehicle rolling over easily.
- This was fixed by adding an anti-roll bar script.
- The AI vehicle controls were confusing so my faculty helped me with its coding
- Vehicle camera movement was shaky when turning.
- The code of the camera movement was removed and added Cinemachine camera.

# Things to Improve

- Cinemachine camera is moving with the vehicle but when the vehicle is turning sharply, the camera wouldn't turn that fast.
- Tweaking vehicle physics.
- Adding particle system to the bullet to get that ray effect.
- Adding controller support.
- Multiple camera positions.