

2307-BSE

Game Development - Project

CS205.2

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Document Outline

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Weekly Log

Week 1

On week 1 I first created the GitHub Repo <https://github.com/ilexl/CS205> with two separate Unreal Projects to avoid merge conflicts at the beginning so both Alex Craig and I could work on the project quickly. I used a '.gitignore' file specific to Unreal Engine products so no temporary files were unnecessarily added.

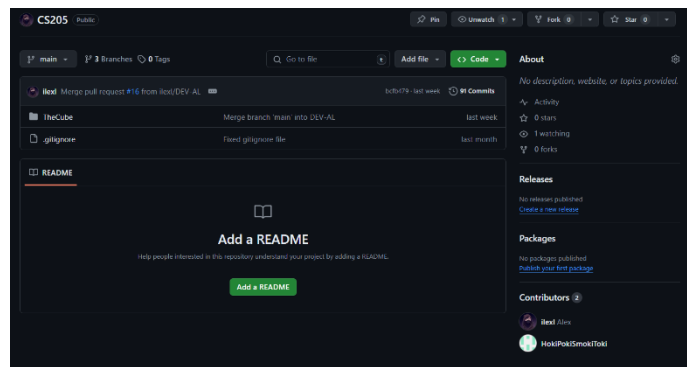


Figure 1: GitHub Repo

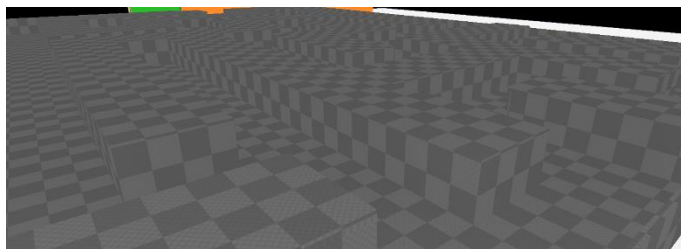


Figure 2: Dynamic Maze Generation

I created a level manager which spawned all the levels in dynamically at run time and added the ability for the levels to move around like a rotating cube depending on which level was going to be played.

Alex Craig had created a maze generator for level 1/6 which dynamically created a maze at run time.

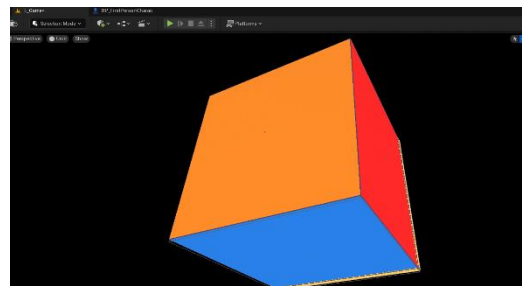


Figure 3: Levels 1-6 as a Cube



Figure 5: Glowing Cubes

I had an issue with the environment being too dark, so I created a light in the centre with random glowing cubes. This solved the issue and looked decent.

I added code which raised the player into the light when the level changed to prevent any unwanted physics which dropped the player into the void.

I created a Main Menu and Settings UI from our Research and made them work in the project.

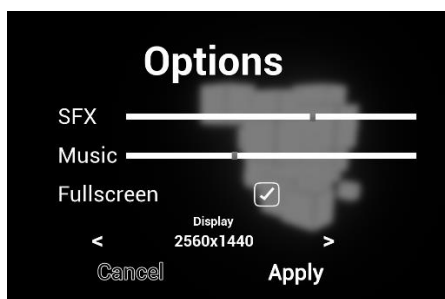


Figure 6: Settings UI



Figure 4: Main Menu UI

I made the graphics settings work and tested to make sure they were still working correctly even in deployment of the built version of the game.

Lastly, I created a temporary and blank HUD so I could work on it in the following week. This was a solid start to the project but, Alex Craig and I knew we had lot more to do in the following weeks.

Week 2

Alex Craig created an item spawner to the maze level which randomly spawned items for now.

I created a health and sprint system along with the UI to add to the HUD. The sprint

Alex Craig added an item pickup blueprint which would allow for any item to be created with this and be picked up easily by a player.

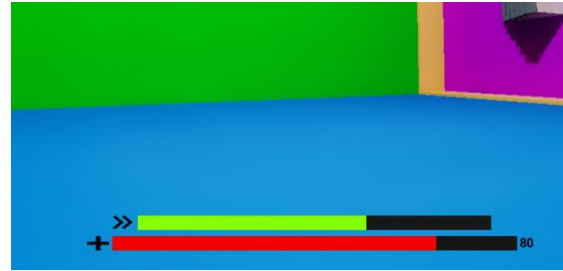


Figure 8: Health and Sprint HUD

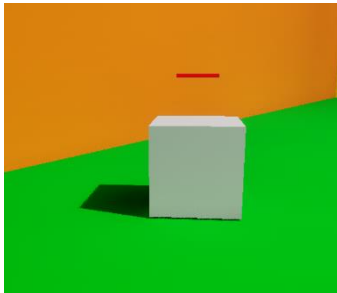


Figure 7: Enemy with Health Bar

I created a temporary enemy for development with. I added health systems to enemies along with a health bar for them so players could see how much health they had left.

I also created the second level where the player has to defeat a wave of enemies to proceed. The default gun you get in unreal was used to deal damage to the enemies as most of the code was already there for us to use so we didn't remake a weapon.

I also decided to merge the project into one Unreal project instead of two. This created a merge conflict but was easy to resolve. This allowed us to work on the same game now and work more closer together.

Week 3

I added weapon selection for the player so they can have more than one weapon. I added slots for 3 possible weapons including the default Unreal Engine gun, a minigun and a gravity altering gun. At this stage I only had the default gun working and had temporary place holders for the others

I also added ammo for the weapons so that the player was forced to go and collect ammo instead of just killing everything. I also added a reload sound for some audio feedback to the player when the gun reloads and misfires.



Figure 9: Weapon Selection HUD

Alex Craig created a moving cube level for level 3/6.

I lastly added objectives to the game on the HUD which work with the levels as they are started and completed so the player has some idea on what to do.

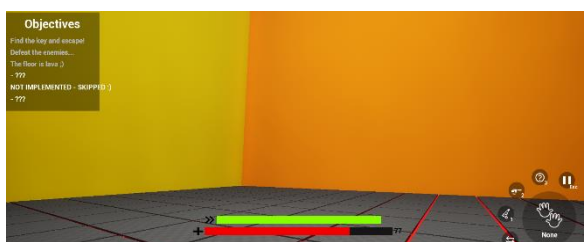


Figure 11: Objectives HUD



Figure 10: Ammo Example



Figure 12: Audio Files

Week 4

Alex Craig created a grid system for the moving cubes level 4/6 and made the cube move/hit each other in a grid like direction.

I created the AI for enemies so they can move around and shoot back at the player. I had an issue where I couldn't dynamically create a van mesh for the AI so I eventually changed the levels to be already spawned in so the Nav Mesh could work.

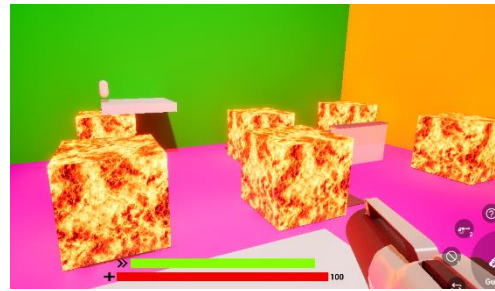


Figure 13: Moving Cubes Level

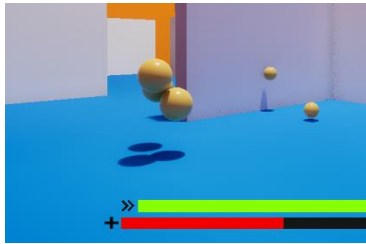


Figure 14: Ammo Pickup

I created a health and ammo pickup from the pickup blueprint made previously. The ammo adds a full mag of the weapon, I used the bullets as the visuals for the ammo pickup as I plan on having different bullets for the minigun.

I made enemies randomly drop a pickup when they die. It is a chance-based drop and not guaranteed.

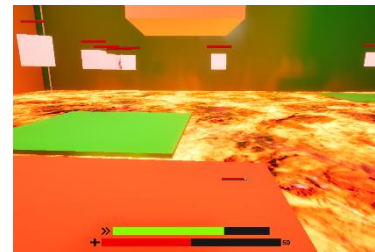


Figure 16: Rising Lava Level

I created a level where lava rises for level 3/6 and platforms that break if you stand on the too long with other platforms moving randomly around to hopefully jump on.

Week 5

Alex Craig made cubes logic for them to move properly and added platform you can jump to keys.

I updated level 2 to make platforms breakable and move randomly and fixed some bugs related to it.

I added a minigun as the second weapon the player can use instead of just having the standard gun.

I updated enemies AI so they can fire back at the player properly.

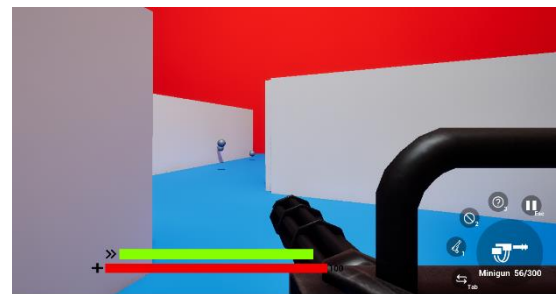


Figure 15: Minigun

Week 6

I fixed z fighting for the breakable platforms on level 3/6 by adding a small z offset between the platforms. Now they overlap with no issues.



Figure 17: Level 1 Walls

I implemented ammo for minigun with a new pickup based on its bullets.

I removed melee enemies due to the complexity and having no animations for them. Ranged enemies both worked well and didn't need an animation.

I added walls to hide behind on level 2 so the enemies can't all shoot you at once and I changed level 2 enemies spawn from all at once to spawn over time.

Lastly, I added a game over HUD and logic.



Figure 18: Game Over HUD

Week 7

I created a 'You Win' screen and added the logic for it when the game is won. Now the player could get back to the main menu.

I created a boss for level 6/6 with one large boss. Killing the boss wins the games.



Figure 19: Win Screen



Figure 20: Boss Level

Alex Craig added damage to moving cubes and added key pickups and logic for end of level 4/6.

Alex Craig created level 5/6 which means all the levels in the game were complete.

I did some finishing tweaks such as commenting code/blueprints and balanced the player's/enemy's damage.

Week 8

We had a completed game by this point and spend most of this week finalising the report and presentation. We also did some user testing for the report and did some small bug fixes that were found from the user testing.

GitHub Tracking

<https://github.com/ilexl/CS205>

Commits on Jun 12, 2024		
Level 2 spawns enemies over time	ilexl committed 2 weeks ago	62d858c
Level 1 spawns enemies over time now	ilexl committed 2 weeks ago	d2974e6
Level 1 has walls to hide behind now	ilexl committed 2 weeks ago	88b1dc7
Removed Melee Enemy	ilexl committed 2 weeks ago	02866b4
Commits on Jun 11, 2024		
SpawnedItems and Enemies for Cube level, just need to delete actors when level finished	HokiPokiSmokiToki committed 2 weeks ago	5cf52ff
Commits on Jun 10, 2024		
Implemented Ammo for minigun	ilexl committed 2 weeks ago	3a45b14
Fixed z fighting for breakable platform + Fixed Rise Logic of lava + Ended Level at top of lava	ilexl committed 2 weeks ago	b8bf5ae
Commits on Jun 7, 2024		
updated cube system now overlaps	HokiPokiSmokiToki committed 3 weeks ago	92146ef
Fixed input context bugging weapon 1/2	ilexl committed 3 weeks ago	6ec4f8d
Enemies fire bullets now	ilexl committed 3 weeks ago	a0f2fa8
Fixed offset for minigun bullet	ilexl committed 3 weeks ago	8815c4c
Fixed minigun reload sound not working and fixed shooting speed	ilexl committed 3 weeks ago	7352a81
Implemented Minigun into game	ilexl committed 3 weeks ago	c65ee9c
Commits on Jun 6, 2024		
Added minigun assets	ilexl committed 3 weeks ago	21a2ce2
Added Minigun as weapon 2	ilexl committed 3 weeks ago	0aa8be2
continued work on cube level	HokiPokiSmokiToki committed 3 weeks ago	ea4f852
Level 2 - breakable platform - lava damages player - other bug fixes	ilexl committed 3 weeks ago	1610c36

Figure 21: GitHub Tracking 1

Commits on Jun 5, 2024		
Created Platforms and scenery need to implement item drop locations on platforms	HokiPokiSmokiToki committed 3 weeks ago	9a3e762
Commits on Jun 4, 2024		
Movement and Collisions completed	HokiPokiSmokiToki committed 3 weeks ago	e197fc8
Commits on May 31, 2024		
Cube Movement buggy	HokiPokiSmokiToki committed last month	1928d56
Added rising lava / platforms to level 2	ilexi committed last month	f801ae1
Commits on May 30, 2024		
implementing Cube movment	HokiPokiSmokiToki committed last month	46a0666
Clean/fix merge	HokiPokiSmokiToki committed last month	534235d
Merge pull request #14 from ilexi/DEV-AL	HokiPokiSmokiToki committed last month	Verified bfe318f
Resolve merge conflict by using DEV-AL as most correct file	ilexi committed last month	d18d3a6
Merge pull request #13 from ilexi/DEV-AC	ilexi committed last month	Verified dc4bc48f
Resolve merge conflict selecting DEV-AC	ilexi committed last month	78e1a2d
Delete DefaultEngine.ini	ilexi committed last month	88f980d
Re Deleted Old Project	ilexi committed last month	11380a9
Ammo pickup for weapon 1 implemented	ilexi committed last month	43d0392
No change	ilexi committed last month	162f488
Enemies drop health and ammo randomly	ilexi committed last month	967d75c
Update L_Game.umap	ilexi committed last month	6cbb4f5
Fixed AI lookat player before attack + changed health pickup look	ilexi committed last month	56bba83
Implemented health pickup to work with player	ilexi committed last month	ff7e984

Figure 22: GitHub Tracking 2

Commits on May 30, 2024		
Moved Assets FORCED	ilexi committed last month	d4e2a51
Moved Assets	ilexi committed last month	3117dca

Figure 23: GitHub Tracking 3

Commits on May 28, 2024		
Added start of AI to game	ilexl committed last month	2b75de4 <>
Grid completed	HokiPokiSmokiToki committed last month	877f59a <>
Commits on May 24, 2024		
2nd level generator not working	HokiPokiSmokiToki committed last month	4a89178 <>
Commits on May 23, 2024		
Sppline implementation due to change	HokiPokiSmokiToki committed last month	11877ca <>
Commits on May 22, 2024		
Fixed reload sound weapon 1	ilexl committed last month	679e4cb <>
FIXED SOUNDS DELETING THEMSELVES	ilexl committed last month	2880c68 <>
FIXED HUD ASSETS DELETING THEMSELVES	ilexl committed last month	37d817c <>
Merge pull request #11 from ilexl/DEV-AL	ilexl committed last month	Verified 835fe1b <>
Commits on May 21, 2024		
Added objectives to HUD for start/end of level	ilexl committed last month	b4de87f <>
Added ammo logic + reload/dryfire sounds to weapon 1	ilexl committed last month	16876c3 <>
Added deselect weapon and HUD for switching weapons	ilexl committed last month	855818e <>
Added weapon tab selection	ilexl committed last month	5683639 <>
Fixed weapons deletion and fixed error on kill enemy	ilexl committed last month	f6639ef <>
Moved First Person Player Controller into Own Assets	ilexl committed last month	1bc9aed <>
Commits on May 18, 2024		
Merge pull request #10 from ilexl/merge-projects	ilexl committed last month	Verified 2bb1fdc <>
Removed old MAZE project	ilexl committed last month	62618bb <>

Figure 24: GitHub Tracking 4

Removed old MAZE project ilexi committed last month	62618bb		
Migrated MAZE project into THECUBE project ilexi committed last month	fcc812e		
Merge pull request #9 from ilexi/Dev-C ilexi committed last month	Verified 49b12d5		
Merge pull request #8 from ilexi/Dev-L ilexi committed last month	Verified 28fe6a1		
Fixed destroy child actors bug + spawn in test enemies for mass wave level ilexi committed last month	25b5832		
Created a blank holder ilexi committed last month	e48fc4c		
Enemies take damage and can die now ilexi committed last month	24c3538		
Commits on May 16, 2024			
Item pickup HokiPokiSmokiToki committed last month	b886414		
Added Sprint + Health System with HUD and Added Base Enemy Class ilexi committed last month	708a2fa		
Commits on May 14, 2024			
spawners and update to meshes HokiPokiSmokiToki committed last month	4e67a78		
Commits on May 10, 2024			
Updated Hud ilexi committed last month	1fe9b85		
Merge pull request #7 from ilexi/main ilexi committed last month	Verified 3942872		
Merge pull request #6 from ilexi/Dev-C ilexi committed last month	Verified 7ef48f		
Fixed ignored files ilexi committed last month	8fc6661		
Merge pull request #5 from ilexi/main ilexi committed last month	Verified bc8af68		
Merge pull request #4 from ilexi/Dev-L ilexi committed last month	Verified 4dfbcab		
Display settings now working ilexi committed last month	331e886		
Pause menu added + linked in with game code ilexi committed last month	a9c189c		

Figure 25: GitHub Tracking 5

Commits on May 10, 2024		
Settings UI Added and Hooked up	ilexl committed last month	ecb18b0
Commits on May 9, 2024		
Main Menu UI linked up to game level	ilexl committed last month	d49524d
Update DefaultEngine.ini	ilexl committed last month	6007d82
Added start and end level code with debug showing behaviour	ilexl committed last month	151fae8
Fixed gitignore file	ilexl committed last month	8c75432
Merge pull request #3 from ilexl/Dev-L	ilexl committed last month	Verified 8ce4004
Lift and hold player in air when moving cube around	ilexl committed last month	74a3db9
Commits on May 8, 2024		
Fixed Main Menu cubes animation + decreased cube lighting	ilexl committed last month	1f5ae31
Added center cube/light thing + fixed issue	ilexl committed last month	56ddf2d
Commits on May 7, 2024		
Added Cube rotation to different levels	ilexl committed last month	ffc06f3
Create cube dynamically at run time	ilexl committed last month	224b249
i didnt change anything	HokiPokiSmokiToki committed last month	444cc03
Merge pull request #2 from ilexl/Dev-C	ilexl committed last month	Verified 13152c4
Merge pull request #1 from ilexl/Dev-L	ilexl committed last month	Verified 223b7e2
Upload Maze generator	HokiPokiSmokiToki committed last month	46d4b84
Project1 Add	ilexl committed last month	b573dff
Initial commit	ilexl committed last month	Verified 6a3c739

Figure 26: GitHub Tracking 6

Findings

Aim

The aim of this project was to answer the following question:

How can we increase engagement for a player in a shooter video game by refining or enhancing a core mechanic.

In further detail a shooter video game genre has various core mechanics. These include fast-paced movement – finding and using weapons – eliminating enemies – finding and using items – health system and compressive level design with progression. Could we increase engagement with a player by refining or enhancing one of these core mechanics in an FPS game without having to create a new core mechanic.

The core mechanic we chose to focus on was the puzzle element within a shooter game. We believed by making puzzles more complex and harder that we would make the game more enjoyable by pushing a player limit and making the player think about what they are doing instead of just spamming bullets.

Challenges Faced

Time limitation – Due to only having 8 weeks to make the MVP we did not have enough time to get everything we wanted to implement put into the game. We created a MVP which can be considered a full game, but there is a lot missing that we would add/change if we had more time.

Limited graphics – We used simple graphics and assets to keep the game simple and easy to code. If we were to come back to this project or continue it in the future, then we would add more complex models and textures to make the game more polished.

GitHub – We had an issue with merging files on GitHub as the files are in Unreal Engine's Binary Format and can't be easily merged. This resulted in a lot of code being deleted when we merged and having to redo it before we could continue.

User Testing

We got 5 random people to play test the game and give us the feedback they had for the game.

Table 1: User Testing

Person #	Comments	Rating #/10
Person 1	"The graphics are quite poor, and the gameplay is okay. The puzzles in the game make it quite difficult but was fun to play."	5/10
Person 2	"This was a fun and simple game! I especially liked the rising lava level, there were multiple aspects that I was forced to focus on to stay alive"	7/10
Person 3	"The game is quite a simple concept and yet not easy at all. Some of the levels were fun and had interesting puzzles but some others were lacking in its originality."	5/10
Person 4	"Even though the graphics are quite simple, this game proves that games don't need to look good to be fun. I practically enjoyed the puzzles of the game while being shot at by the enemies."	6/10
Person 5	"The game is quite enjoyable; from the time you said you had this is an enjoyable game with some unique puzzles and enemies."	8/10

Conclusion

From the user testing we got some helpful feedback about the game with a mean rating of 6.2/10. The aim of this project was to create a shooter game and focus on improving the puzzles mechanics to improve player enjoyment. Given the limitations we faced, I believe the project was a success. We have a completed MVP which players tended to enjoy the puzzles within. Although with more time we could have polished up the game and added more features into the game, we still completed our objective by creating the MVP.

References

Ilexl. (n.d.). *GitHub - ilexl/CS205*. GitHub. <https://github.com/ilexl/CS205>