



The Bunker 2101

Independent Project (ACCA6020), Final Viva

Michael Dawe (2206831)

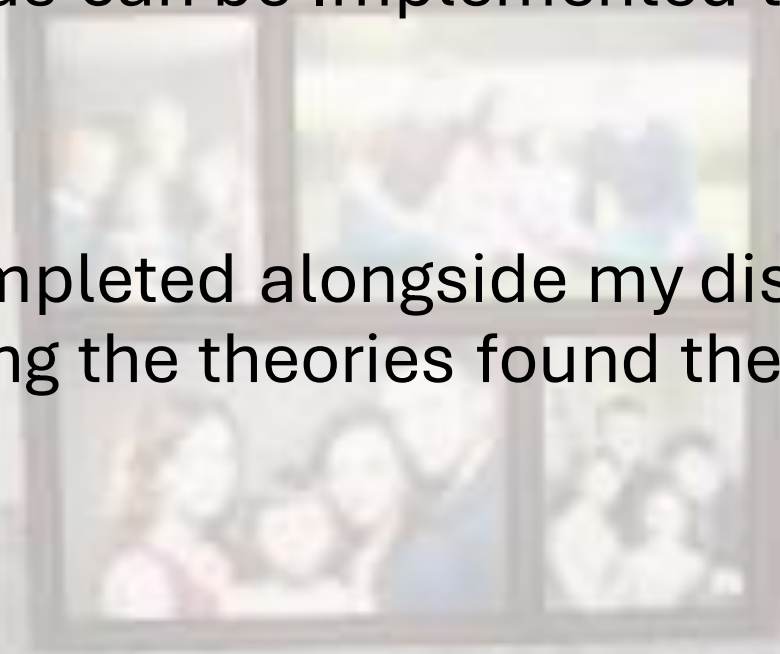
Contents:

- Research Question
- What is 'The Bunker 2101'?
- Project Planning
- Project Development
- Playtesting
- Project Outcomes
- Issues and Solutions
- Project Future
- Conclusion
- Demo and Questions

Research Question

What Proven Methods can be Implemented to Increase Player Engagement?

This project was completed alongside my dissertation research, with the aim of testing the theories found therein.



What is The Bunker 2101?

My game, currently called 'The Bunker 2101', is a multiplayer adventure game with elements of existential horror and humour, set in a post-apocalypse underground city.

Inspiration for the project came from enjoying environments slightly removed from real life, while wanting to keep maximum immersion with a more realistic environment than found in a lot of futuristic games.

What is The Bunker 2101?

At the start of the project, I ran a survey with two game ideas, along with general questions related to what people like to see in games.

“A single-player emotional exploration puzzle game set in present day Wales. Progress your career, starting as a primary school teacher, while keeping your boss happy and looking out for the welfare of your students. Engage in dialogue, use your intuition, delegate, and make important decisions to get the best ending.”

Elevator Pitch 1

“A multi-player co-op survival adventure game set in a post-nuclear-apocalypse world. You’ve lived your whole life in an underground bunker, but society is crumbling around you and you choose to escape to the surface and take your chances outside. Fight enemies, trade resources, and solve puzzles to save your clan.”

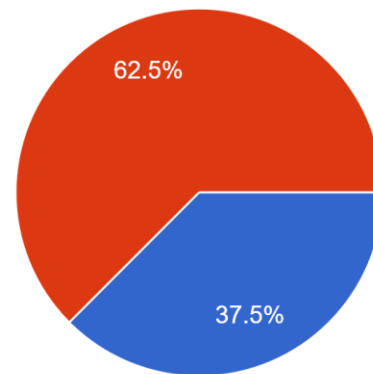
Elevator Pitch 2

What is The Bunker 2101?

This game idea had more interest, along with general interest in multiplayer and the post-apocalypse environment.

Imagine you have a voucher for a free copy of either game, it can only be used once. Which would you use it on?

8 responses



- A single-player emotional exploration puzzle game set in present day Wales. Progress your career, starting as a primary school teacher, while keeping your boss happy and looking out for the welfare of your students. Engage in di...
- A multi-player co-op survival adventure game set in a post-nuclear-apocalypse world. You've lived your whole life in an underground bunker, but society is crumbling around you and you choose...

What is The Bunker 2101?

The storyline has been developed further since, currently following four flat-mates who were born in the bunker.

Society is crumbling and they have lost everyone they care about aside from each other. They decide to leave the bunker at any cost.

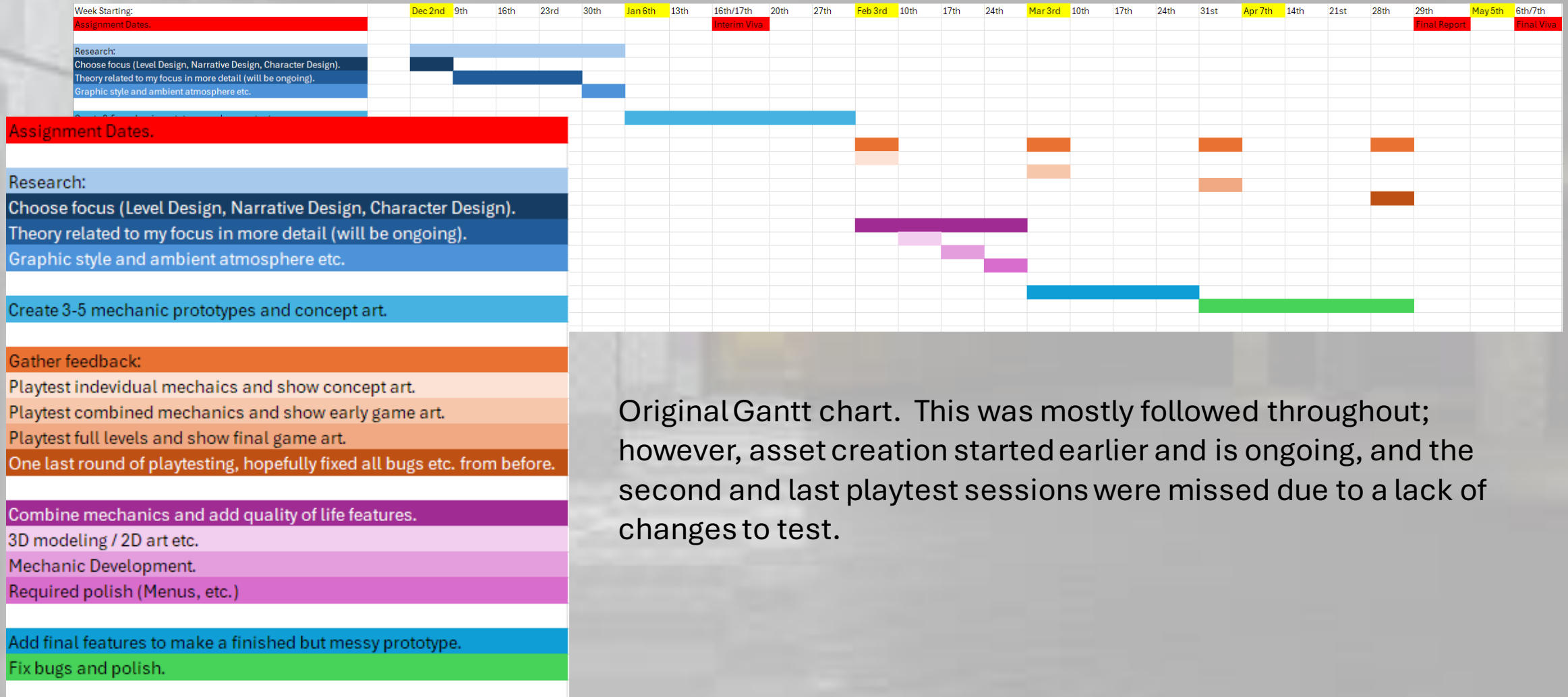
When they finally get out at the end of the game, they will find that the earth has recovered well and is safe, but the sensors around the bunker were broken leading everyone to think it was still dangerous.

What is The Bunker 2101?

The mechanics chosen for the game are based on research in the dissertation and feedback from playtesting.

Particular care was given to player movement and interaction systems, along with the inclusion of multiplayer.

Project Planning



Original Gantt chart. This was mostly followed throughout; however, asset creation started earlier and is ongoing, and the second and last playtest sessions were missed due to a lack of changes to test.

Project Planning

GAME DESIGN DOCUMENTS ONE-SHEET TEMPLATE GAME TITLE PAZD Elevator Pitch: A multi-player co-op survival adventure game set in a post-apocalyptic-apocalypse world. You have found your whole life in an underground bunker, but society is crumbling around you, and you choose to escape to the surface and take your chances outside. Fight enemies, make resources, and solve puzzles to save your clan. INTENDED PLATFORMS PC / Steam LANDSCAPE / DIALOGUE / OF PLACES 1/25 MINUTE / PRO / OBS NOTING 1/15 SUMMARY OF GAME STORY (INCLUDING OR SAMPLING) You join to find the outside world. You have spent of your life in an underground bunker system after nuclear apocalypse, but society is crumbling, and you have decided to find your way back to the surface and take your chances outside. You will fight gangs, robbers, police officers, and guards at different points through the game. In levels: - Different challenges and puzzles. - Some fighting, and some stealth. - All realistic (no zombies etc.) but you'll still have enemies, both gangs and guards etc. at different points. UNDERSTANDING POINTS (GIVE) Scott Rogers 'One Sheet' Template GDD1 GDD-01	GAME DESIGN DOCUMENTS ONE-SHEET TEMPLATE Priority assets, realistic settings, fun multiplayer interactions, co-op multiplayer and PVP multiplayer between stealing gangs / guards / etc. COMPETING PRODUCTS / SIMILAR GAMES Redout Series, Left 4 Company, KLEIN, Day Game, Context: Use [WASD] for walk (normal movement). Hold [SHIFT] while walking to run (fast movement, loses stamina system?). Press [CTRL] to toggle crouch (slow movement). Double press [CTRL] to go prone (very slow movement, hidden if in something e.g. bushes, radioli etc. etc.). Double tap [WASD] to turn left in direction selected (use to dodge attacks etc., has a 5 second cooldown, some stamina system?). Use [SPACE] to jump (does not work when crouched or prone). Hold [SPACE] while crouched or prone to stand up to peek over things, does not speed up your movement, doesn't move at all while using thing). Use [QWERTY] to look around and aim etc. Use [LMB] to interact with object or attack (if not aimed at interactive object and in range to interact). Use [RMB] for special operations depending on scenario. Use [F] to reveal weapons. Use [F] to open inventory (backpack). Use [ESC] or [P] to pause game (when in single player, shows menu but does not pause if in multiplayer). Use [F11] to toggle full screen. Scott Rogers 'One Sheet' Template GDD1 GDD-01	GAME DESIGN DOCUMENTS ONE-SHEET TEMPLATE Use [QWERTY] WHEEL to select hot bar slot, [player can have 6/17] items on hotbar, plus backpack which can hold more (based on weight / cost). Use weight changes your speed and some items take multiple slots the that taking game. 3 COMPETING PRODUCTS / SIMILAR GAMES Redout Series, Left 4 Company, KLEIN, Day Game, Context: Use [WASD] WHEEL to select hot bar slot, [player can have 6/17] items on hotbar, plus backpack which can hold more (based on weight / cost). Use weight changes your speed and some items take multiple slots the that taking game. 3 Drag and drop items between [backpack and hotbar]. Drop items outside GDD to drop on ground, or press [D] to drop held item when at rest in inventory. Artistic Style: Pixelated 3D. Rendered at 5 or 10 resolution and upgrade with nearest neighbour. Dark as a little spooky but not too too color the same games. Dark enough to let the mind fill in the gaps in the textures etc. 2 Levels: Level 1 (opening returned): Backdoor to back slot. Main character's house is taken to drive a waste truck outside on a 'bushy island'. STRONG, or find gang, take people or gangster from your neighbourhoods to drive the waste truck (actual train or road train?) outside every now and then, when waste that cannot be pumped or expelled automatically built up, or when the automatic system needs repairing etc. These people never return to inside anyone thinks they are doing as the surface... So, use of the player's [name] is taken to this trip. Maybe has no choice in the matter. But the characters that they are still after something, and having nothing to say behind for, in a crumbling society, they decide to try to get out themselves. Believing that they are going on a suicide mission, but hoping to use the route that their partners took... Maybe they have a bit someone this way, and the most recent one was the last one... And they have nothing left to be for. That is their reason for escape. Level 2 (Bunker): "Your Apartment", starting in the player's apartment (but the level involves the whole complex). Level 3 ("Underground City"): Outside the apartment, underground city, sort of like a storage sort of, sort of some way building is a bit larger, and people have attempted to decorate their alcove, but everything is in ruins and covered in trash and the road has one thing on it. Level 4 ("Open Road"): After reaching the carpark where your car is, you head out on the road. Level 5 ("City Hub"): you drive to the city hub, the original point at which people went underground, and the closest point to the surface as far as you know. This is a rich Scott Rogers 'One Sheet' Template GDD1 GDD-01	GAME DESIGN DOCUMENTS ONE-SHEET TEMPLATE neighbourhood, and you are unaware how. You must get into a maintenance area somehow. COMPETING PRODUCTS / SIMILAR GAMES Redout Series, Left 4 Company, KLEIN, Day Game, Context: Use [WASD] WHEEL to select hot bar slot, [player can have 6/17] items on hotbar, plus backpack which can hold more (based on weight / cost). 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GDD, this was developed at the start of the project and continued to be expanded upon.

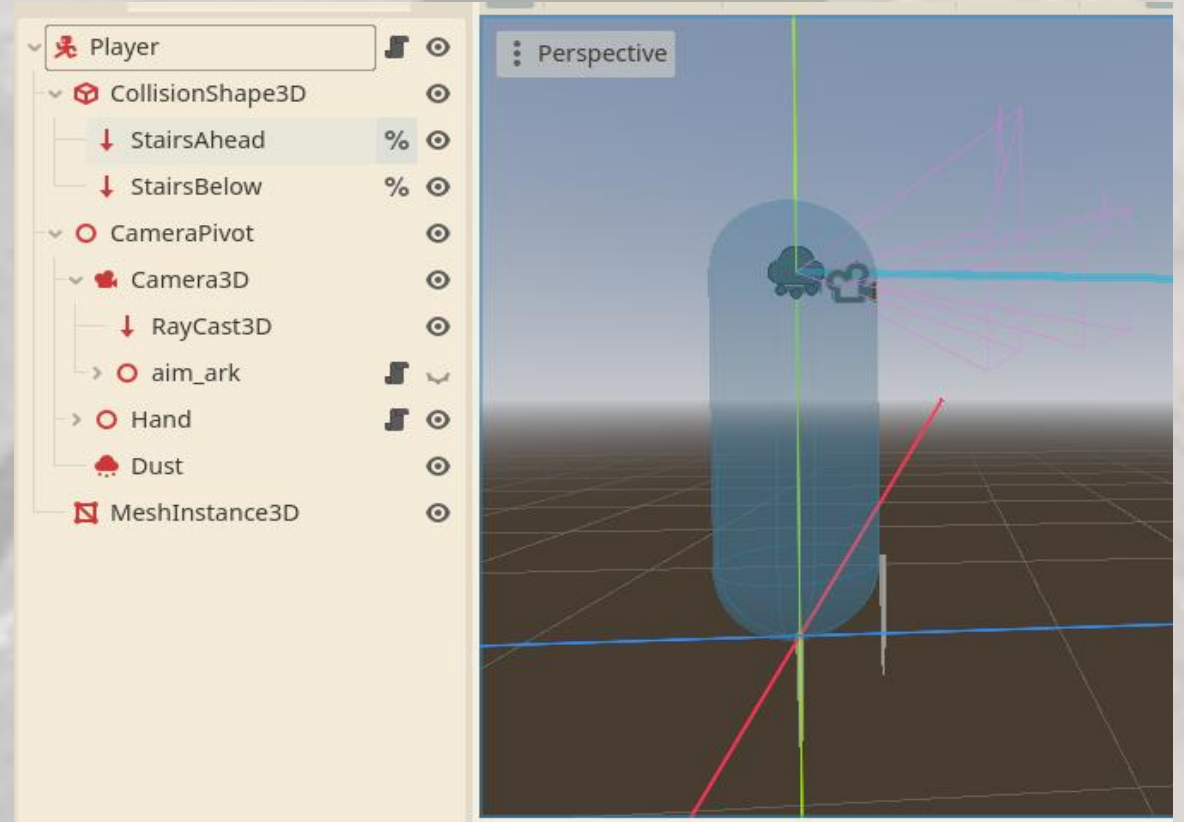
Project Development – Key Mechanics

- LAN Multiplayer
- Player Movement System
- Smart Interaction System
- Items and Inventory
- Crafting System
- NPCs, enemies, and friends
- Dialogue System

```
41 # called internally to handle multiplayer hosting
42 ▼ func _host():
43     >| is_multiplayer = true
44     >| # create server
45     >| peer.create_server(PORT, max_players)
46     >| multiplayer.multiplayer_peer = peer
47     >| multiplayer.peer_connected.connect(_add_player)
48     >| multiplayer.peer_disconnected.connect(_player_left)
49     >| _add_player()
50
51 # called internally to handle multiplayer joining
52 ▼ func _join():
53     >| is_multiplayer = true
54     >| # create client
55     >| peer.create_client(URL, PORT)
56     >| multiplayer.multiplayer_peer = peer
57 ▼ >| # use RPC calls from host instead, this way we should get the right IDs and stuff
58     >| #multiplayer.connected_to_server.connect(_add_player_client)
59     >| #multiplayer.peer_disconnected.connect(_player_left_client)]
60     >| multiplayer.server_disconnected.connect(_server_disconnected)
61     >| multiplayer.connection_failed.connect(_cant_connect)
```

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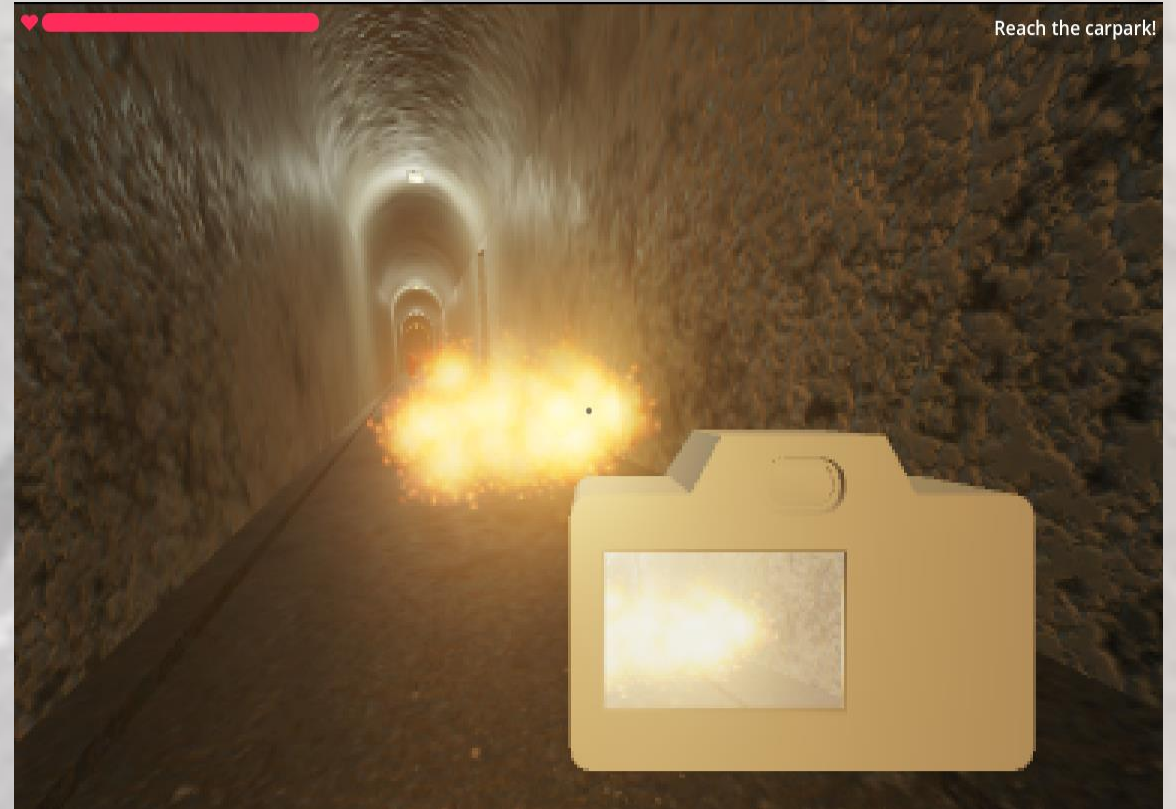
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```
99  ▾ func interact_none():
100  >| crosshair.visible = true
101  >| crosshair_active.visible = false
102  >| crosshair_active_enemy.visible = false
103  >| crosshair_active_friend.visible = false
104
105
106  ▾ func interact_standard():
107  >| crosshair.visible = false
108  >| crosshair_active.visible = true
109  >| crosshair_active_enemy.visible = false
110  >| crosshair_active_friend.visible = false
111  >|
112  >|
113  ▾ func interact_enemy():
114  >| crosshair.visible = false
115  >| crosshair_active.visible = false
116  >| crosshair_active_enemy.visible = true
117  >| crosshair_active_friend.visible = false
118  >|
119  >|
120  ▾ func interact_friend():
121  >| crosshair.visible = false
122  >| crosshair_active.visible = false
123  >| crosshair_active_enemy.visible = false
124  >| crosshair_active_friend.visible = true
```

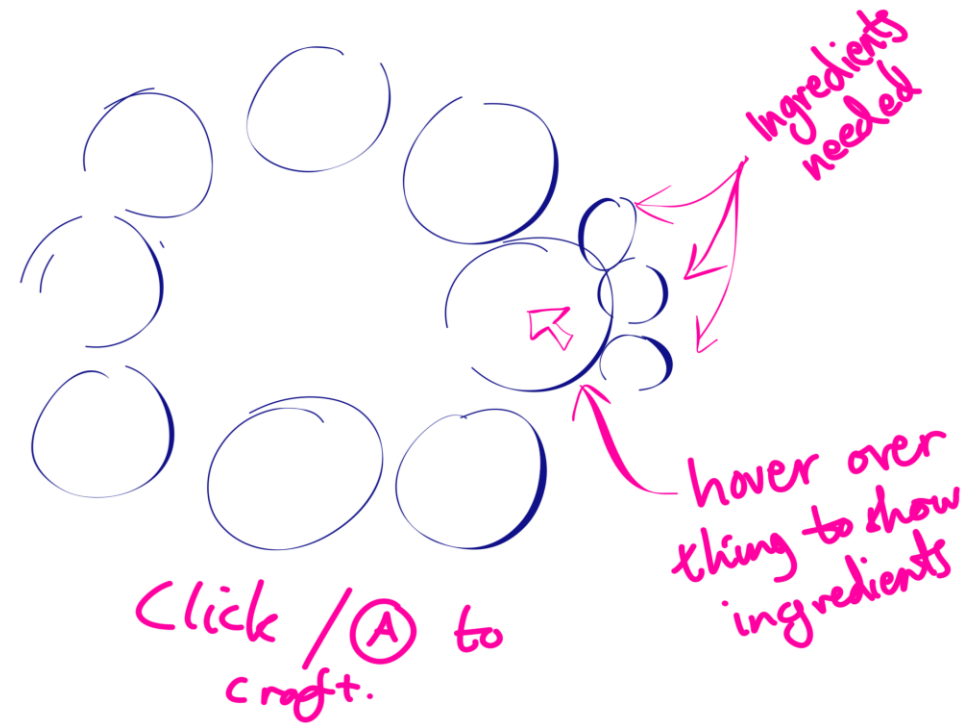
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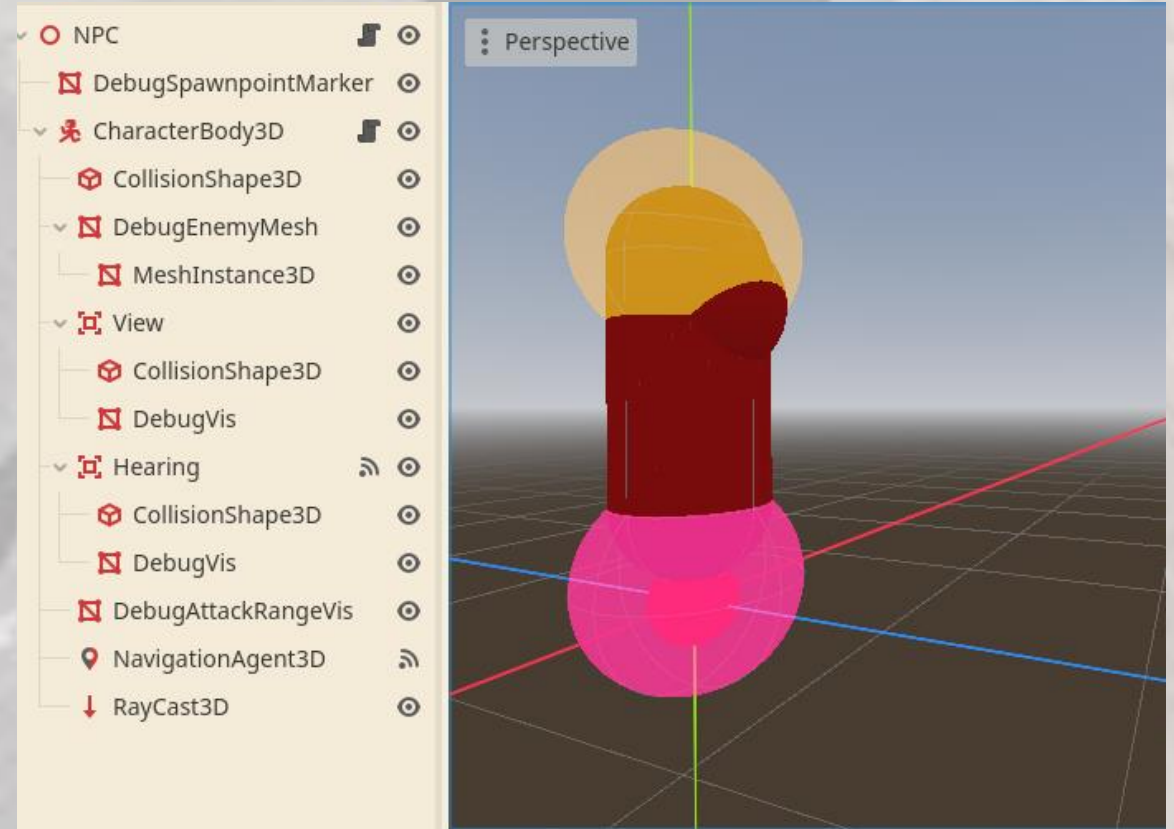
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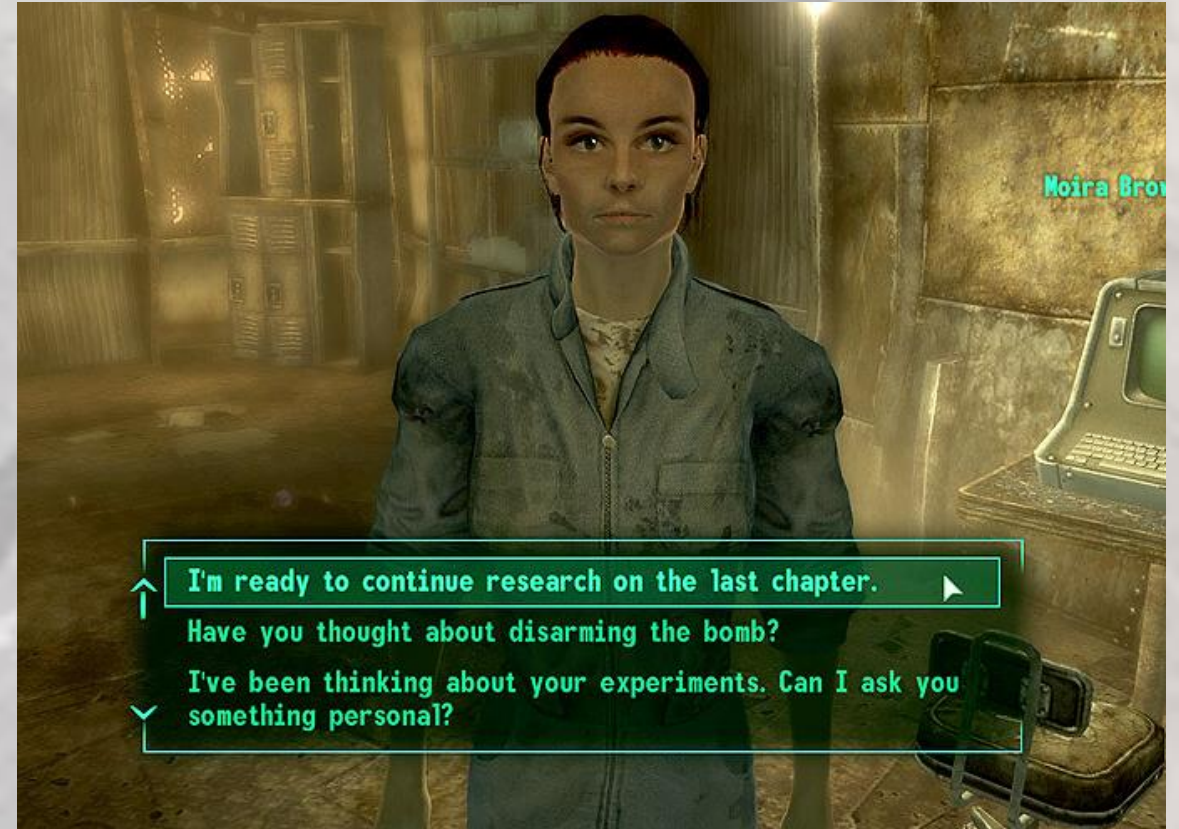
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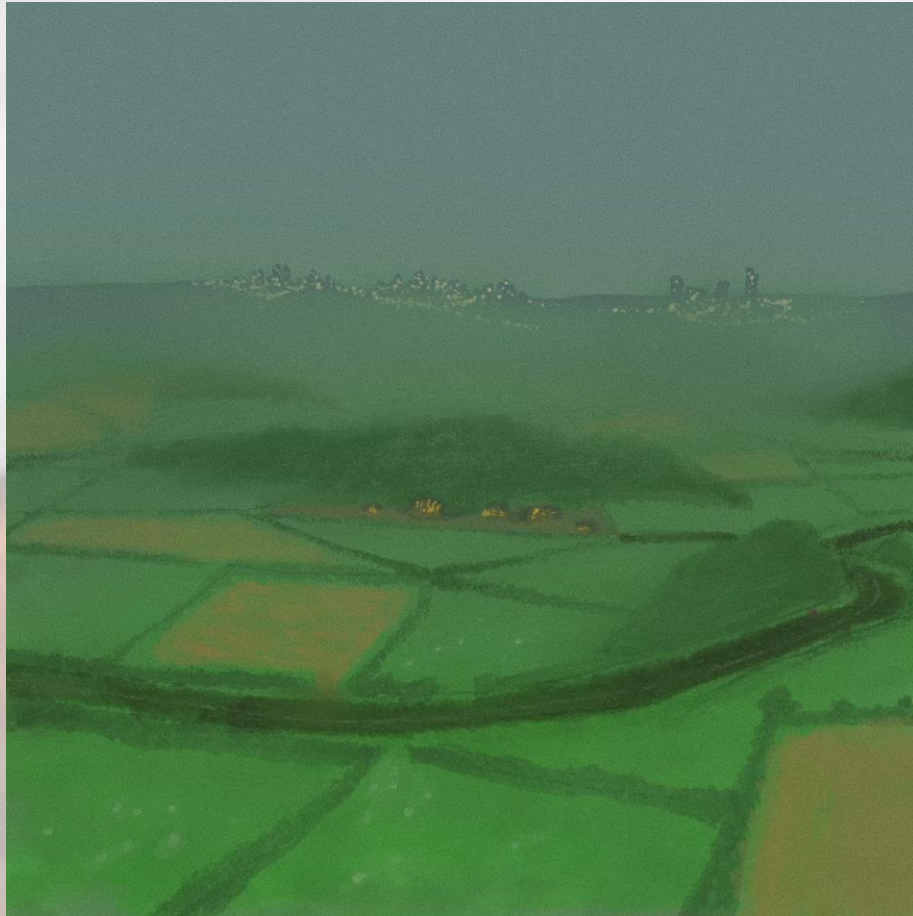
Example of dialogue system (fallout 3) [2]

Project Development – Cutsscenes

The plan is to have a double opening cutscene, and an ending cutscene.

During gameplay there may be scripted events which briefly take control of the in-game camera to draw attention to specific areas.

Project Development – Cutsscenes



Early concept work for starting cutscene.

The starting cutscene will be a slideshow of photos from outside before the disaster, the process of going into the bunker, and children being born and growing up in the bunker, who then become the playable characters.

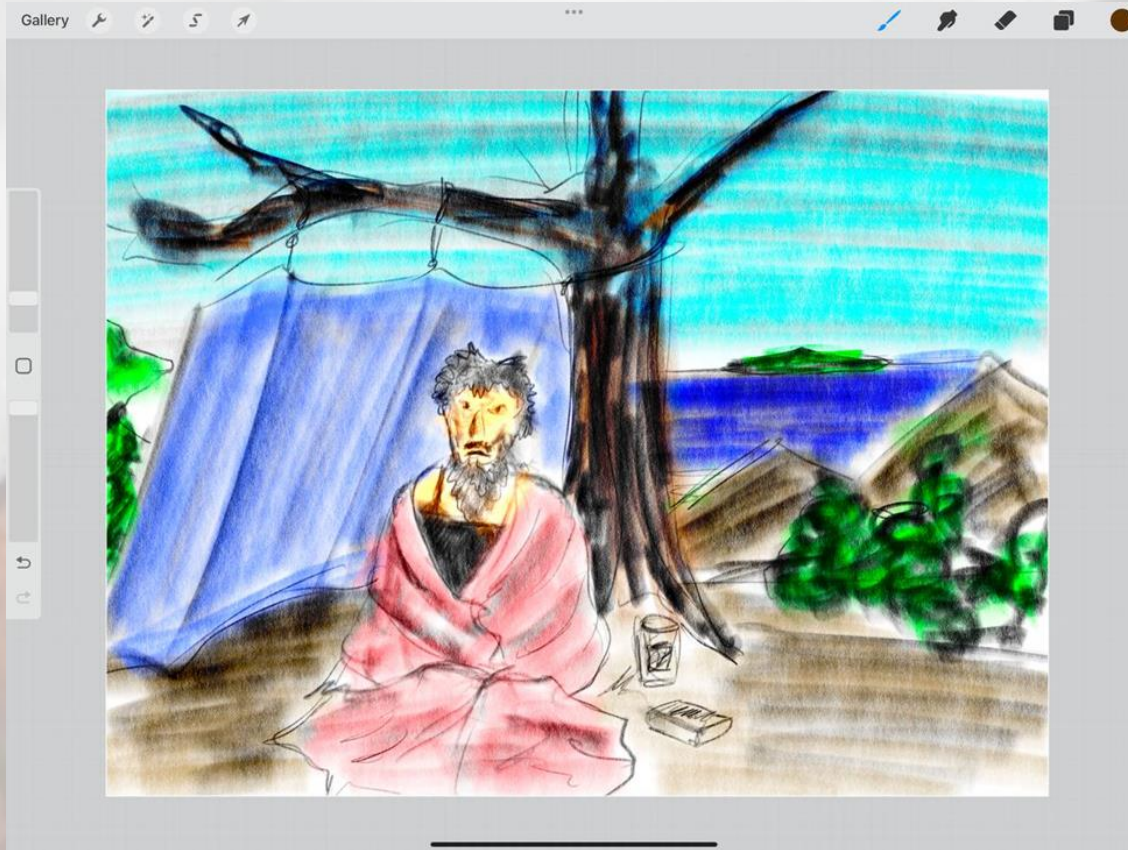
Project Development – Cutscenes

A: "You got the car?"
B: "Yes, for 48 hours."
A: "Great. That'll get us to the city."
C: "So, is everyone sure we're doing this?"
A: "We have to, if we don't leave now we'll die here."
D: "We could always go another time."
A: "Sure but if we don't today we probably won't have the courage again, besides we've got the car now, we never know if we'll get another chance."
B: "You know we won't go unless we are all sure."
D: "I'm still in, it's just feeling more real now."
C: "We can always turn back if we change our minds, let's just take this opportunity, we'll see the city if nothing else!"
B: "I couldn't get a permit for the city, but we can get close."
C: "What will we do when we get there?"
A: "Well the entrance was to the north, so we can go around the city and try to get into the maintenance tunnels."
B: "Maybe we can sneak into the city, just to see it before we go?"
A: "Yeah we could go to the casino haha."
C: "If we're really leaving we could."
D: "We might need money outside, we don't know what's out there."
A: "Probably just radioactive snow."
D: "Yeah..."

Draft script for second starting cutscene, played in the 3D world after all players have joined.

This may include a flashback showing life in the bunker, or the slideshow may show their jobs and losing the people they loved.

Project Development – Cutsscenes



The ending cutscene will be bittersweet. It will show the world is healthy, and the player characters will be re-united with their families, but there will also be an old man camping outside the bunker wondering if one day his family will come out too.

Project Development – Music

Here are some samples of music made in GarageBand for the game. None of this is final, I may use royalty free music instead.

These clips have been made from sections 4 to 30 seconds long which can be played in random order to create a long form background track that doesn't become monotonous.



Project Development – Characters



- Steve – Male (realistic)
- Libby – Female (realistic)
- Avery – ‘masculine’ nonbinary (realistic) (default)
- Aspen – ‘feminine’ nonbinary (realistic)
- Alisha – Black Female (realistic)
- Caleb – Black Male (realistic)
- Jumbo – Male (cartoon / fantasy)
- Tiki - Female (cartoon / fantasy)

Project Development – Characters



Two of the characters, Steve and Libby, have been created so far.

Note they are not animated, I plan to use freely available animations from Mixamo[3].

Playtesting

Playtesting was carried out twice. The first round focused on the player movement system, also presenting items and inventory.

Two versions of the game were used, some with a group of mechanics including coyote time enabled, and some without.

The testers were not told that the game versions were different. I had hoped to tell them after the first test and let them play the other version, but there wasn't time for this.

Playtesting

Feedback from the first round was positive, with players on the version with coyote time being less frustrated, although it was a small difference.

Players liked the timed parkour section and shared their scores with each other – seeming to find that the best part of the game. While multiplayer wasn't being tested as a mechanic it was clear that interaction between players increased their enjoyment.

Playtesting

The second round of playtesting focused on multiplayer and environment design, while also including early enemies and a few fixes or additions based on qualitative feedback from the first round, for example, using inverted colours on the crosshair to increase visibility against bright surfaces.

Players in multiplayer enjoyed the game more; however, they also explored it less. Feedback relating to the environment was mostly positive too, although some said it was too dark – this will be considered in the future.

Project Outcomes

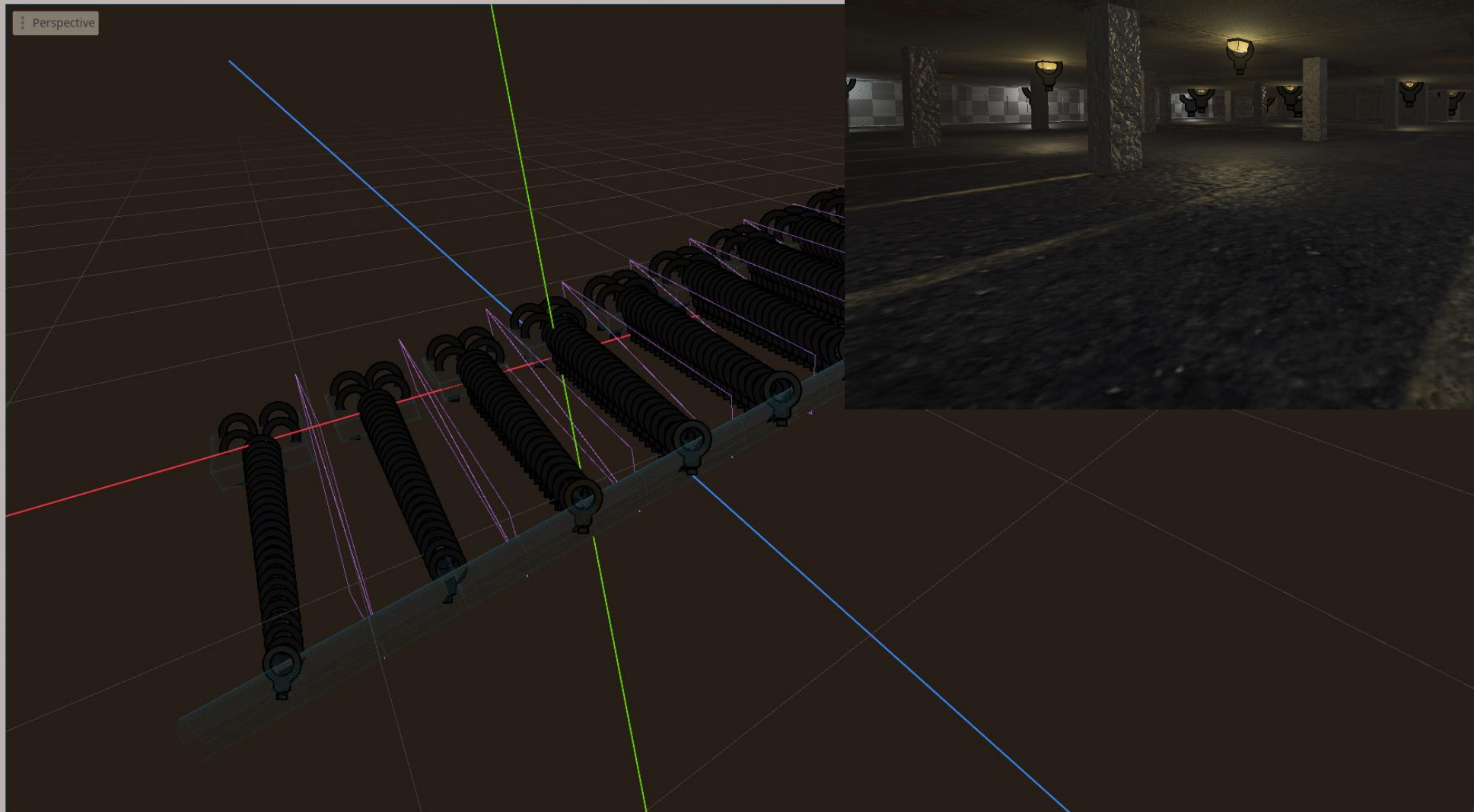
The project has resulted in a playable portion of the game, representative of the overall idea.

I originally intended to create the first three levels of the game, and to playtest four times. However, due to complications with multiplayer and the decision to create separate gameplay testing areas first, I was only able to create two levels, and some of the 3D environment is unfinished.

Project Outcomes



Project Outcomes



Issues and Solutions

A few technical issues were encountered, including changes to the Godot engine after updating.

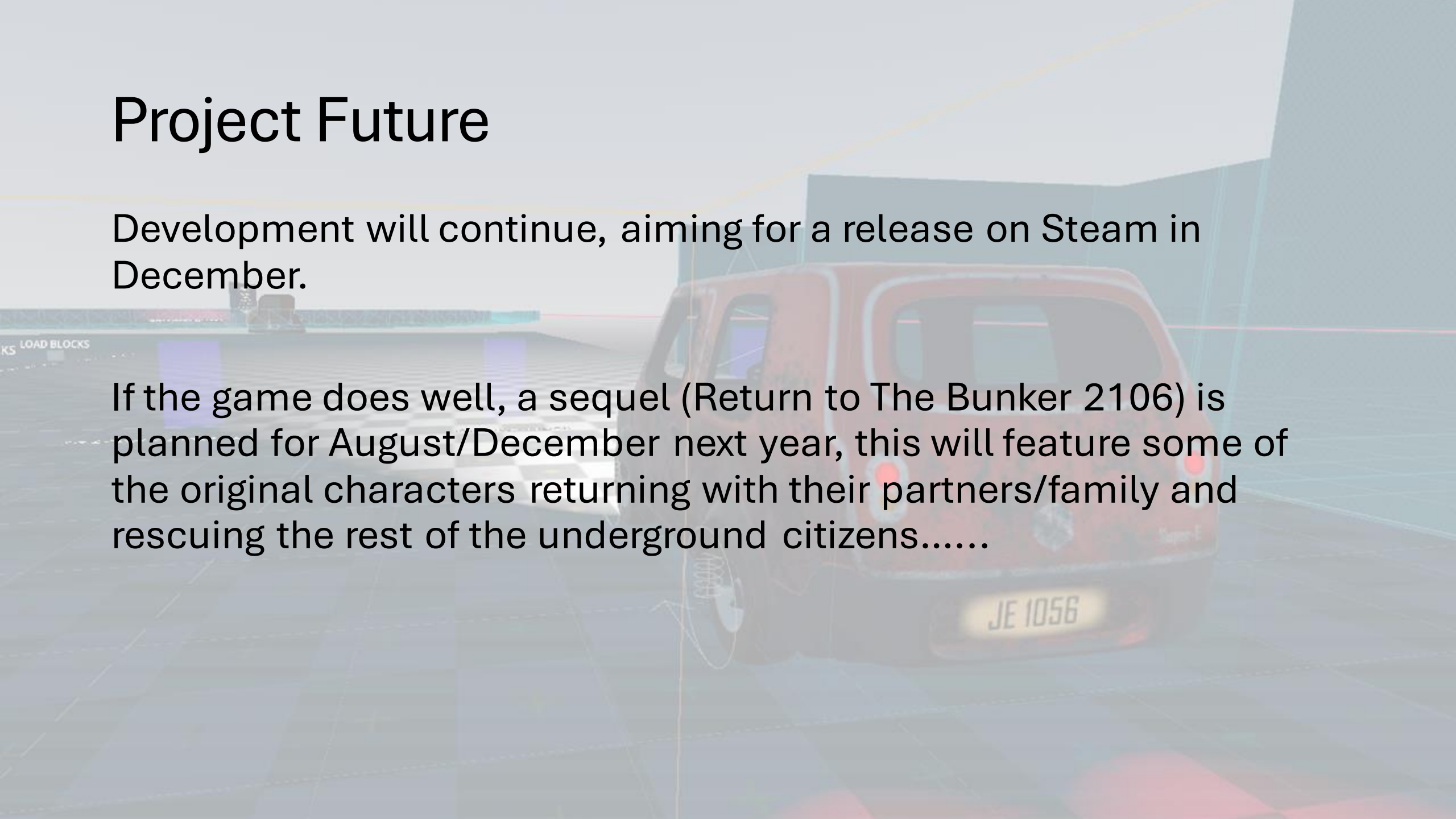
This affected the quality of baked light; however, it ended up being an inspiration for allowing the player to turn lights on and off.

The inclusion of multiplayer also slowed down development significantly, but I feel that it was an important part of the game and playtesting.

Project Future

Development will continue, aiming for a release on Steam in December.

If the game does well, a sequel (Return to The Bunker 2106) is planned for August/December next year, this will feature some of the original characters returning with their partners/family and rescuing the rest of the underground citizens.....



Project Future

Research has been made into funding from Creative Wales[4], Media Cymru[5], and Tramshed Tech[6]. However, it is hard to find funding for a startup with no employees and no previous commercial releases.

I'm looking for funding that would allow me to work full time on the game, create an online lobby for multiplayer without a LAN connection, and commission voice actors, etc.

Conclusion

I feel that the project has achieved the intended outcome and has been an excellent learning experience.

Feedback from playtesting has aligned with my previous research, although the test userbase was limited.

Demo and Questions

Thank you for listening!

I would now like to show you the game first-hand and answer any questions you may have.



Appendix A: Use of Generative AI

InvokeAI[7] with stable diffusion[8] models was used to create a few textures in the game, these are detailed below:

Type	Filename in game files	Usage description
Whole Texture	res://textures/level_0/TV_wallpapers/0.png res://textures/level_0/TV_wallpapers/1.png res://textures/level_0/TV_wallpapers/2.png res://textures/level_0/TV_wallpapers/3.png	TV screen slideshow in first level living room
Partial Texture (just the posters and photos)	res://textures/level_0/albedo_orm_normal_2/AlbedoOnly_baseColor.png	Poster and standing photo in first upstairs bedroom, first level
Partial Texture (just the posters and photos)	res://textures/level_0/albedo_orm_normal_2/AlbedoOnly_baseColor.png	Posters in second upstairs bedroom, first level
Partial Texture (just the posters and photos)	res://textures/level_0/albedo_orm_normal_2/AlbedoOnly_baseColor.png	Standing photos in third upstairs bedroom, first level
Whole Texture	res://textures/level_1/UV_poster_albedo.png	Poster in square courtyard in second level

Appendix B: Downloaded Assets

A few downloaded assets were used in the game, these are detailed below:

Type	Source	Filename in game files	Usage description
Whole Image	Chabad.org, “Does Judaism Believe in the Apocalypse?,” @chabad, Apr. 22, 2018. https://www.chabad.org/library/article_cdo/aid/4006520/jewish/Does-Judaism-Believe-in-the-Apocalypse.htm (accessed Apr. 29, 2025).	N/A	Used as menu background in first playtest.
Whole Image	“heart Vector Icons free download in SVG, PNG Format,” Veryicon.com, 2019. https://www.veryicon.com/icons/miscellaneous/eva-fill/heart-126.html (accessed May 07, 2025).	res://textures/ui/heart-126-64.png	Health icon on HUD.
Partial Texture	“Free Texture Cracked stucco,” Texturelabs.org, 2020. https://texturelabs.org/textures/concrete_123/ (accessed May 07, 2025).	res://textures/level_0/level0_down stairs_floor.png	Kitchen floor.
Whole Texture (modified)	“Free Texture Rough aged wood,” Texturelabs.org, 2020. https://texturelabs.org/textures/wood_127/ (accessed May 07, 2025).	res://textures/level_0/table.png	Dining table.
Font	1001 Fonts, “Bad Suabia Swing Font · 1001 Fonts,” 1001 Fonts, 2015. https://www.1001fonts.com/bad-suabia-swing-font.html (accessed May 07, 2025).	res://fonts/bad-suabia-swing.regular.otf	Title font.
Font	“SEGMENT16C Font 1001 Free Fonts,” 1001 Free Fonts, 2025. https://www.1001freefonts.com/segment16c.font (accessed May 07, 2025).	res://fonts/Segment16C Regular.ttf	Radiation meter display font.

References:

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