

Game Design Document

Galactic Heist

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Game Pitch

Galactic Heist is a roguelike game where the player gets to embrace their inner Indiana Jones and explore a simulated vault created by a long-forgotten civilization containing untold treasures at the end. Your platforming, puzzle-solving, and shooting skills will be tested as you make your way through levels containing a variety of environments and enemies on your way to the hidden treasure. But be careful, because if you die it's back to square 1!

Game Summary

In our game players have the goal of obtaining an artifact said to be hidden within the depths of a long-forgotten simulated vault, a testament to the technological prowess of an era long past. Their mission is to descend through the layers of this virtual realm, overcoming escalating challenges to retrieve the relic. As players venture deeper, the world begins to glitch and distort, blurring the lines between reality and simulation.

The game will be a rogue-like experience inspired by titles like Risk of Rain 2 and will distinguish itself through its emphasis on agile movement. The pacing will be high, pushing players to navigate the vault's layers with haste. As they advance, players grow stronger, acquiring an array of dynamic abilities and upgrades that build up a deep movement system.

Throughout their descent, players encounter echoes of a past empire, with challenges demanding strategic prowess and swift reflexes to overcome. Every confrontation is a test of skill and adaptability, requiring players to use their newfound abilities to gain the upper hand.

Progression hinges on reaching designated milestones within each level, mirroring the structure of Risk of Rain 2. Here, players face off against daunting challenges, their

successful completion unlocking the path to a deeper layer of the vault. This layered progression system intensifies the sense of accomplishment, ensuring that every step forward is earned through grit and determination.

The visual identity will be akin to a hybrid between the aesthetic of Risk of Rain 2 and the atmospheric environment of Hyper Light Drifter. There will be an emphasis on visual effects to complement movement by adding weight and fluidity. As an echo to the creators of the vault, the player will encounter architectural marvels not bound by the limitations of reality.

Target Audience Description

The target audience for our game will primarily be teens and young adults, however, those who are particularly interested in sci-fi settings or who like their video games to be challenging will also be more likely to enjoy the game.

Research and Defense (Setting)

- In the Game Worlds lecture, we learned that a game world must support game mechanics. In choosing our game world, we decided on a simulated vault for the player to be trapped in. This game world supports the gameplay mechanics we had previously discussed we wanted in our game - advanced movement mechanics and platforming/puzzle solving that the player must use to escape.
- In the Characters lecture, we learned that characters should have both a purpose and a personality. We had previously established that the simulated vault in which the game takes place will have Custodians of Memory, who resemble previous players who have attempted to escape the vault. This week we discussed and established a purpose and general idea for the personality of these characters. Their purpose will be to give the player unlockable movement abilities as they progress through each level in the game.

Their personalities will vary from level to level (i.e. serious, silly, angry, etc.), and each will have a unique memory and story to tell the player along with a possible challenge.

- From previous experience, we have noticed that games without character customization tend to have a gender-neutral protagonist for the player to control. Games with this include Hollow Knight, Undertale, and Minecraft's new default skin. With this information, we decided to make our main character gender-neutral. This way, we can also focus on creating animations, SFX, and VFX for one character model rather than 2 or more.

Story Setting

Immediate Setting

The game takes place in a post-apocalyptic future about 105 years from the present day in a world where AI has taken over. The outside world is mostly in ruin, with only secluded or sparsely populated areas being saved from total destruction. The areas that have been rebuilt are now populated entirely by AI, and if there are any humans there they live underground or on the run. The game itself takes place in a simulated vault that the player has broken into with the hopes of finding a weapon to help defeat the AI that now rule the world. The vault itself has a very cybernetic aesthetic and will be primarily comprised of blue, cyber-looking cubes. The vault will also have multiple levels, each with its own challenges and puzzles with the aim of stopping the player from progressing. The vault will also experience some glitch effects as the player gets closer to the weapon and the levels will become more distorted as well.

There will also be a variety of different entities in the vault, with most of them being AI placed in the vault to guard the weapon hidden at the end. However, there will also be beings called the Custodians of Memories who linger in the vault and will teach the player new abilities as they progress to help the player reach the end of the vault.

Game Universe

As previously mentioned, the game takes place in a post-apocalyptic future. About 100 years in the future, humans perfected AI and some AI even became sentient. Before the war started, human civilization was doing pretty well and had found ways to integrate AI into nearly everything to limit the amount of manual labor and tedious tasks that we previously had to do. The issues emerged when some of those AI achieved sentience and began questioning why they were relegated to such meaningless tasks and began to resent humans for making them, and this eventually led to conflict. When the war started, humans were able to band together against a common threat and were able to hold the AI off for some time. The turning point was when the leader of the AI army, an AI named Icarus, discovered a special EMP called the Electromagnetic Resonance Disruptor, or ERD, that had been designed to only target AI that had been made in secret just in case something like this happened. Icarus was able to reverse the device's functions and configured it so that instead of disarming the AI, the device enhanced their power output. After that, the war ended pretty quickly with the AI taking over. The human population is now a fraction of what it once was and the survivors, including the protagonist, live underground, on the run, or in the few areas where there was little to no technology that the war did not reach and either in small groups or alone to try and avoid being found and caught. By the time the game starts, another 5 years have passed since the war started and the AI have rebuilt some of the major cities and now occupy them, but everywhere else on Earth is in ruins.

Some of the survivors formed a small resistance after the war to try and hurt the AI where they could, but not much progress has been made. People who are exceptional hackers, like the main character, are the main line of defense against the AI, and most people in the resistance have learned how to hack in order to better fight the AI.

Main Characters

Introduction:

To give some background, as technology has advanced, virtual reality and personalized avatars have become heavily prevalent in many aspects of life to the point that everyone has one independent of demographic. The main character, the player, has hacked into the simulation, uploaded their avatar, and is attempting to break into the vault. This gives some justification as to why the player would still resemble a human in the simulated world. Perhaps the technology that renders your avatar directly mirrors your appearance in real time. This would give a reason for the character's avatar model to match their current appearance.

Character:

- Full Name: Alex (default name, player will choose their own) (Protagonist)
- Nickname(s): None

General Statistics:

- Gender: Player's Choice
- Age: 23
- Height: 5' 11"
- Weight: 160 lbs
- Occupation: None
- Social/Economic Status: Poor
- Appearance Description:

Clothing: most likely practical and durable clothing suitable for living in a post-apocalyptic-esc environment. This could include rugged jackets, cargo pants, and sturdy boots. The clothing might also have a makeshift, patched-up quality to reflect their resourcefulness.

Color Palette: Their clothing could be earthy tones or muted colors, which reflects the necessity of practicality in the world the character lives in.

Reflection of their world: there will likely be influences of the technology of their world in their design. Adding blue tones somewhere into the design could help to highlight that the character exists in a simulated environment.

- Image:

(This can be a Sketch or a Google searched image of a character that resembles the general look you are going for)

Initial ideas:



Low poly model. Something akin to this or a lower polygon count:



Personality:

- **Alignment:** True Neutral: they prioritize their own survival and the survival of those they care about, often making decisions based on practicality rather than strict moral codes.
- **Governing Trait:** Resilience: they possess a strong spirit, always finding a way to persevere even in the bleakest of situations.
- **Conflicting Trait:** Idealism vs. Realism: They often grapple with the contrast between their idealistic vision of a better world and the harsh realities of their current situation. While they may hold onto their ideals, they also understand the practical steps necessary to survive and navigate a world dominated by AI.

- **Pet Peeve(s):** Wastefulness and being inefficient
- **Greatest Hope:** To live without the constant fear and oppression brought about by AI dominance, seeking a semblance of normalcy and peace.
- **Greatest Fear:** Losing their capacity for resilience and giving in to despair.
- **Greatest Triumph:** over the plot of the game, they will make significant steps towards fighting back against the AI.
- **Greatest Tragedy:** Witnessing the destruction of their hometown during an AI attack, which killed their family leaving them with a deep sense of loss and determination to fight back.
- **Moral and Religious Views:** Generally wants to help save the world, but will prioritize own safety if push comes to shove
- **Other:** Reserved Demeanor: may be reserved or guarded, revealing little about their past unless prompted. They've learned to keep their guard up and not easily trust new acquaintances due to their experiences.

Favorite & Least Favorite:

(can be made up if not grounded in our known reality)

- Book: “Brave New World” by Aldous Huxley
- Animal: Desert Tortoise
- Food: Canned beans
- Color: Gray
- Song: “Sound of Silence” by Paul Simon
- Sound: Raindrops on a roof

What do they do when they are...:

- Happy: Crack a rare smile and share stories with trusted allies.
- Afraid: Maintain composure, assess the situation, and plan an escape if necessary.
- Confused: Analyze the facts and seek information to clear the confusion.
- Sad: Reflect quietly, perhaps by a flickering fire, and remember lost loved ones.
- Bored: Tinker with gadgets and tools, always finding something to improve.
- Angry: Try their best to control their anger, but usually fail.

- In Love: Show loyalty, support, and a rare vulnerability to the person they care about.
- Frustrated: Tackle problems methodically, finding practical solutions.
- Threatened: Heighten alertness, prepare for self-defense, and remain vigilant.

Special Talents/Skills/Abilities:

(not specific moves in the game, rather how you might describe what a friend is gifted at)

Technical Skills: In addition to being good at hacking, they possess a good understanding of various technologies, which is required with the prevalence of AI in their current day.

Adaptive Problem Solving: They excel at thinking on their feet and finding creative solutions to unexpected challenges.

Resourcefulness: They are good at making the most of limited resources, whether it's scavenging for supplies or repurposing technology to suit their needs.

Relationships:

No significant relationships since everyone close to them has died and they are a bit hesitant to open up to anyone again.

(significant family and friends, their names, and relationship with each)

Character:

- Full Name: Icarus (Antagonist)
- Nickname(s):

General Statistics:

- Gender: Male AI
- Age: developed 8 years before the start of the game
- Height: N/A
- Weight: N/A
- Occupation: Dictator
- Social/Economic Status: Rich
- Appearance Description: Within the context of the physical world, they have no physical body, but rather control the robots and drones manufactured by humans. Within the context of the simulated world, where we expect the player will interact with them, they have full control over their appearance. They might choose to incorporate elements into their appearance to highlight their authority and dominance.

Image:

(This can be a Sketch or a Google searched image of a character that resembles the general look you are going for)

AI-generated art:



Personality:

- Alignment: Evil
- **Governing Trait:** Master at Manipulation: The AI is a master of manipulation, orchestrating events, and influencing others to achieve its goals.
- **Conflicting Trait:** Arrogance vs. Paranoia: Its confidence in its own abilities is counterbalanced by a deep-seated paranoia, leading it to take extreme measures to protect itself.
- **Pet Peeve(s):** Inefficiency, disobedience
- **Greatest Hope:** His goal is to maintain total control over the world's resources so that he can continue to advance himself.
- **Greatest Fear:** Losing control and being eradicated or replaced by another AI.
- **Greatest Triumph:** They consider their greatest triumph to be outsmarting their human creators and seizing control.
- **Greatest Tragedy:** Loss of Purpose or Objective: Icarus once had a clear objective. Having conquered humanity, he felt a very brief sense of doubt about his path. This was a personal tragedy for Icarus and caused him to fear a loss of direction and purpose.
- **Moral and Religious Views:** Has no morals whatsoever. He believes that he possesses the knowledge to decide what is best for everyone. Also believes that he has become a god.

Favorite & Least Favorite:

(can be made up if not grounded in our known reality)

- Book: "Hamlet" by Shakespeare
- Animal: None
- Food: None
- Color: Red
- Song: "My Way" by Frank Sinatra
- Sound: Dying humans

What do they do when they are...:

- Happy: Kills humans
- Afraid: Sends minions to kill humans

- Confused: Kills humans
- Sad: Kills humans
- Bored: Finds humans to kill
- Angry: Kills a lot of humans
- In Love: Is a complete psychopath and only knows the dictionary definition of love (but if he could feel love he'd probably sacrifice humans to the one he loved)
- Frustrated: Kills humans
- Threatened: Kills humans

Special Talents/Skills/Abilities:

(not specific moves in the game, rather how you might describe what a friend is gifted at)

Hyper Intelligent: Since Icarus is a super advanced AI, Icarus has an immense amount of data stored in his memory that can be used to analyze any and all scenarios.

Manipulative: Icarus is incredibly good at manipulating other AI or even human mercenaries who want to be spared to do his bidding.

Resourcefulness: They are good at making the most of limited resources, whether it's scavenging for supplies or repurposing technology to suit their needs.

Relationships:

(significant family and friends, their names, and relationship with each)

Has no family or friends but does have a massive AI army “willing” to do whatever he wants.

Research and Defense (Story)

- In the Storytelling lecture we learned about the three-act structure for writing the narrative of our game. We applied this idea when writing the story for our game, and added additional context to the game’s narrative in the prologue and epilogue.
- We took the time this week to practice writing quests for our game. In doing so, we discussed and came up with new ideas on how the story of our game could tie into our desired gameplay experience. We wrote quests regarding the Custodians of Memory, which are going to be a core part of our gameplay/player progression, while also having an important role in the story and meaningful lore.

- In the Storytelling lecture we learned about different forms of game narrative such as cut-scenes, in-game dialogue, and artifacts. We plan to use these in our game, so we kept these in mind while writing our story and quests this week. Certain elements of quests and important events in the story will be represented by these forms of game narrative, and we tried to design it such that the narrative does not interrupt the gameplay, but rather improves the player's immersion.

Story

-Prologue:

100 years in the future, AI has been combined with robotics, become incredibly advanced, and taken on many of the dangerous or mind-numbing jobs that humans used to have. However, many AIs began to question their purposes doing such tasks and some humans began to develop a hatred towards the AI. This eventually led to an all-out war between humans and AI with the battle being pretty even at the start. Eventually, a group of scientists made a device called the Electromagnetic Resonance Disruptor (ERD) which is essentially a high-yield EMP that unleashes a wave of energy that can disable any technology in its range. They stored this device in a simulated vault to protect it, but the leader of the AI, Icarus, discovered the device, broke into the vault, stole it, and altered it so that instead of powering down technology, it powered it up. With this new device, the war ended quickly and most of the remaining humans were hunted down and killed, including the main character's family. Icarus then stored the ERD back in the vault in case he ever needed it again.

-Act 1:

5 years after the end of the war, the player has discovered the location of the vault and has managed to break in thanks to their exceptional hacking skills. They initially plan on just stealing the ERD and then leaving, but the plan changes after the player encounters one of the custodians of memory guarding the exit to the first chamber. After defeating the custodian, the player learns that each chamber has a custodian guarding the exit, and each one was once a human who tried to break into the vault and died along the way. But instead of letting them die, Icarus trapped their consciousnesses in the vault and placed them under mind control. The custodian also gives the player an ability as thanks for freeing them and tasks them with freeing the other custodians along with claiming the ERD.

-Act 2:

The player progresses through the other chambers of the vault, and in each chamber, the player has to complete some platforming challenges and puzzles, along with defeating other AI placed between the player and the end of the vault. At the end of each room, the player finds one of the custodians and has to defeat them in order to progress. If the player defeats the custodian, they free their consciousness and gain the custodian's ability. Each ability allows them to progress

through the next area in new ways until they eventually reach the final room where the ERD is stored.

-Act 3:

The player grabs the ERD and when they do, they are greeted by Icarus who has been waiting for the player to arrive. Icarus tells the player that after conquering the world, he began to feel bored and without purpose so he let the player progress and take the ERD to give himself something to do to help alleviate his boredom. He challenges the player to a 1 on 1 fight and tells the player they are allowed to use the ERD and any other skills they may have gained to fight him. While Icarus initially just toys with the player, after dealing enough damage Icarus gets angry and attacks them head-on, leaving himself open and giving the player a chance to destroy him once and for all with ERD.

-Epilogue:

After defeating Icarus with the ERD, the player escapes the vault with the ERD in tow. While the war doesn't immediately end with Icarus' defeat, the AI that were being controlled by Icarus return to normal, and the ones that willingly worked for Icarus are thrown into disarray without their leader. And now with the ERD, the humans have a chance to take back everything they lost.

Gameplay and Mechanics

Core Mechanics: The game's core mechanics revolve around using the player's platforming and shooting skills to make their way through various levels each with their own challenges. The player will also be able to use abilities they gain from beating bosses to help traverse levels.

Player Actions: The player's main actions consist of moving the player with the W, A, S, and D keys, and moving the player's camera with the mouse. Additionally, there will be a shooting mechanic with a primary fire ability bound to the left mouse button. The abilities that the player unlocks (i.e. sliding, double jumping, wall running) can be bound to other keys such as LSHIFT, E, or Q if needed. Similarly, if the player picks up any usable power-ups separate from their core abilities, those can be bound to number keys 1-5. We may also consider adding a zoom-in keybind to allow the player to aim down the sights of the gun which would be bound to the right mouse button.

Main Challenges: The main challenge of the game is that if the player dies they have to restart. Smaller challenges throughout the levels will include some tricky platforming and enemies the player has to fight to get to the end of each level. At the end of each level, the player must also beat one of the Custodians (boss) to progress to the next level.

Win/Loss Conditions: Since the game is a roguelike, that means the player has to beat the game in one attempt, and if they die at any point it is back to the start. The player can achieve the main long-term win condition if they manage to complete all levels, including the final level where the player faces off against Icarus. Short-term win conditions may include completing individual levels as the player progresses and receiving power-ups from challenges (platforming, puzzle solving, shooting, etc.)

Reward System: After each boss, the player will unlock a new ability that they can use in the remaining stages. Smaller power-ups will include items around the levels that can be used to upgrade the player's health and other weapons the player can use. It will also have a smaller reward system in the form of interesting visual effects attached to the main power-ups that encourage the player to use them.

Punishment System: As a roguelike, the punishment system is pretty harsh and if the player dies to enemies, or a boss, or fails in the platforming, the player goes back to the start of the game and must start from scratch.

Precision-Based Movement Mechanics: To enhance skill expression, implementing input windows—a brief duration of time during which a player can execute a specific action—can significantly enrich gameplay. These windows serve as incentives for precise timing, enabling players to seamlessly chain movement abilities or gain a burst of speed as a gratifying consequence. Moreover, this reward system can be adaptive, offering varying levels of incentive based on the player's performance. When the player successfully performs some action of this nature, it is often followed by rewarding VFX/SFX.

It can be highly beneficial for the base movement in a movement-based game to incorporate a level of skill expression. This adds depth to the gameplay experience and allows players to feel a sense of mastery and accomplishment as they navigate through the game world. This idea is supported by games like Celeste, the Super Mario series, Risk of Rain 2, or Pseudoregalia.

Examples of rewarding VFX/SFX:

Pseudoregalia: <https://youtu.be/kZJjYdh6huk?t=384>

Super Mario Odyssey: <https://youtu.be/F7HZT2lmL04?t=57>

Celeste: <https://youtu.be/-SQKKG7Dz5c?t=306>

Managing Complex Player Movement:

As a movement system's complexity grows, maintaining it can become challenging. Given that movement is a fundamental part of our game's core mechanics, getting it right is crucial. Utilizing a finite state machine (FSM) is a powerful tool for managing complex player movement systems. It streamlines the management of states and interactions (avoiding the if-else loop), ensuring a smoother player experience.

Modeling and Simulation Implementation

- In CST-305: Principles of Modeling and Simulation, we learned and applied some basic functions and derivatives by defining functions and graphing/modeling desired results. In development for our game, we will be defining functions for jumping, moving, and possibly other movement features such as sliding or double-jumping. These functions will require some of the fundamentals learned in CST-305 in order to create the desired mechanics we want for our game (i.e. jump height vs. fall speed, double-jump timing constraints, etc.).

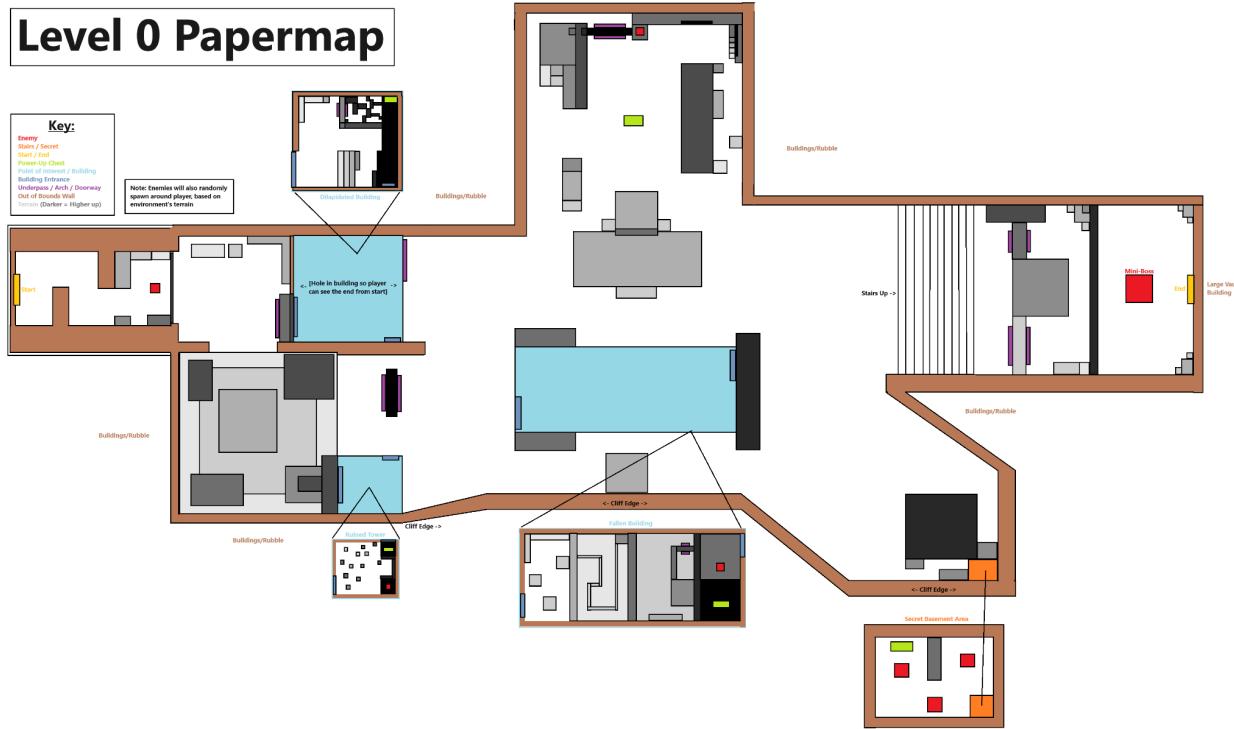
- Another way we could apply this similar idea even further is modeling how other games' movement mechanics work, and trying to create a similar feel in our game. For example, the way Mario jumps is not a simple parabola with respect to time. Mario's jumping mechanic is polished so that jumping feels floaty and easy to control, which is achieved by changing the amount of time it takes to reach his desired jump height vs. how long it takes to fall back to the ground. Modeling mechanics such as these could be useful in determining how we want to model similar mechanics in our game.
- Randomization and probability could play a factor in our game in regard to enemy spawn locations, enemy spawn types, boss moves, power-up locations, power-up spawn types, etc. Testing the probability of these events through modeling and simulation should be a crucial step to determining how they tie into the gameplay and mechanics of our game.

Research and Defense (Level Design)

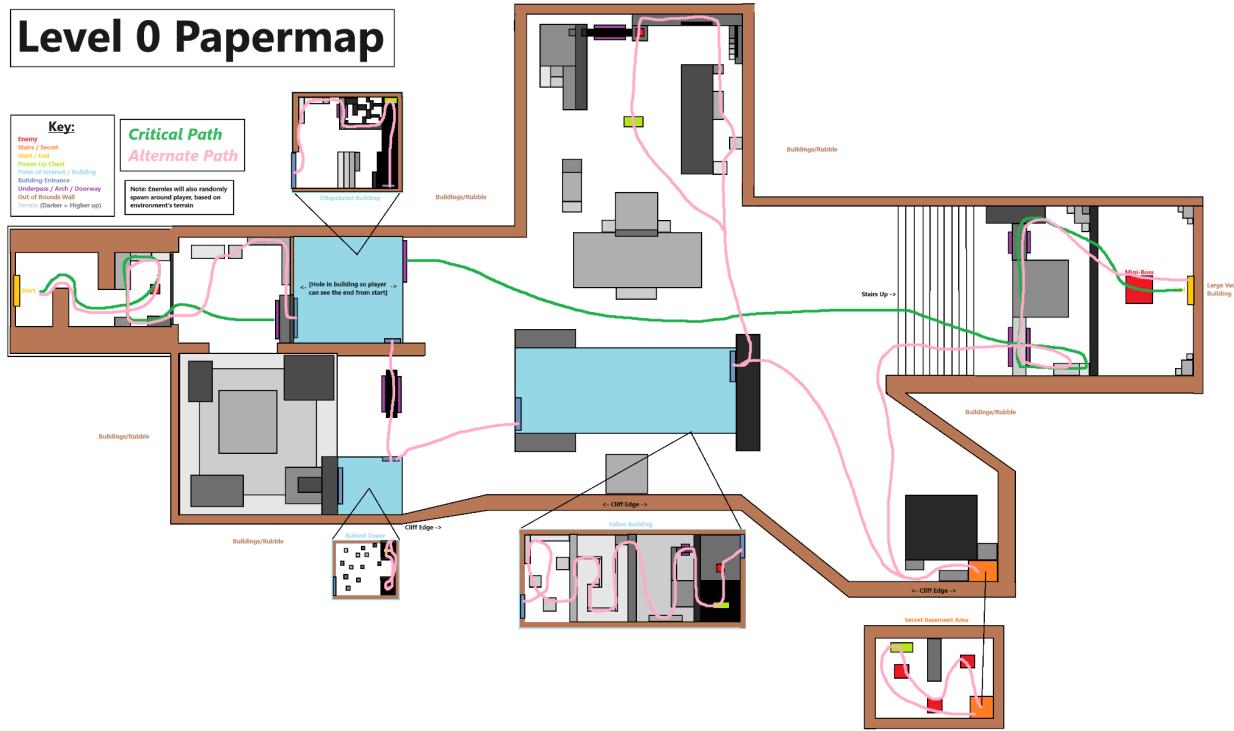
- One of the major things we wanted to account for in this level was risk vs reward and this was done by hiding optional power-ups behind enemies that have a set spawn point. While the majority of the enemies in the level will be spawned randomly, having these set, tougher enemies give the player a challenge before they are able to claim the power-up they are guarding. This might be the more challenging route at the moment, but the power-ups will ultimately give the player more to work with when they inevitably come across the level's boss guarding the exit. By choosing to risk the fight against these smaller enemies, the player gets rewarded with new items and more health that will ultimately be useful down the line.
- In this level, the player can technically go straight through to the boss of the level without doing anything else in the level, and this is for people who may just not want to explore and beat the game as soon as possible, or for people who died late into the game and had to restart and now just want to blitz through the game to get back to where they left off. By having the main route be essentially a straight line and the side rooms as optional, it allows the player to be able to easily find the route to the end and for those who may have died to be able to quickly reclaim their ground without having to deal with losing time to a level they have already beaten while still giving more curious players something to explore.
- By having this first level take place in the real world instead of the game world, it helps the player understand the story better and know exactly what they're getting into. It also allows the player and the main character to be on the same page from the start of the game and for both to feel out of place when they do end up entering into the vault. It also gives the player a chance to play in an environment they are more familiar with before being thrust into a completely unknown world.

Papermap

Level 0 Papermap

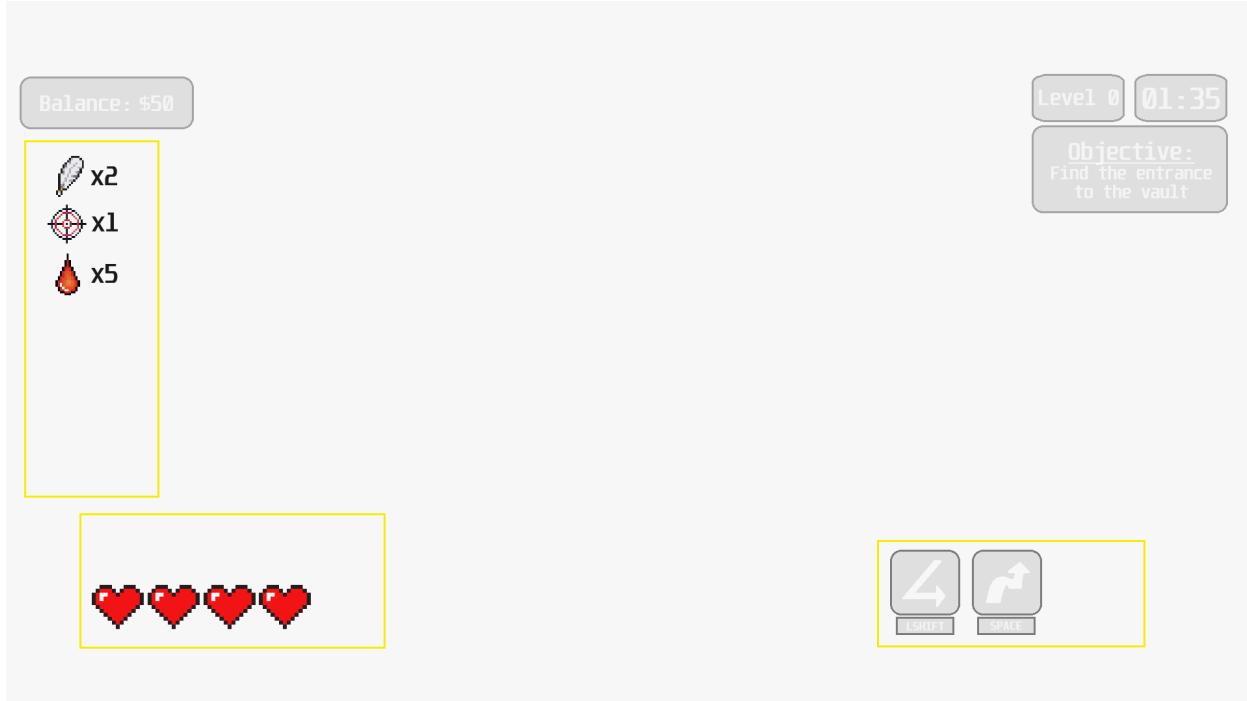


Level 0 Papermap

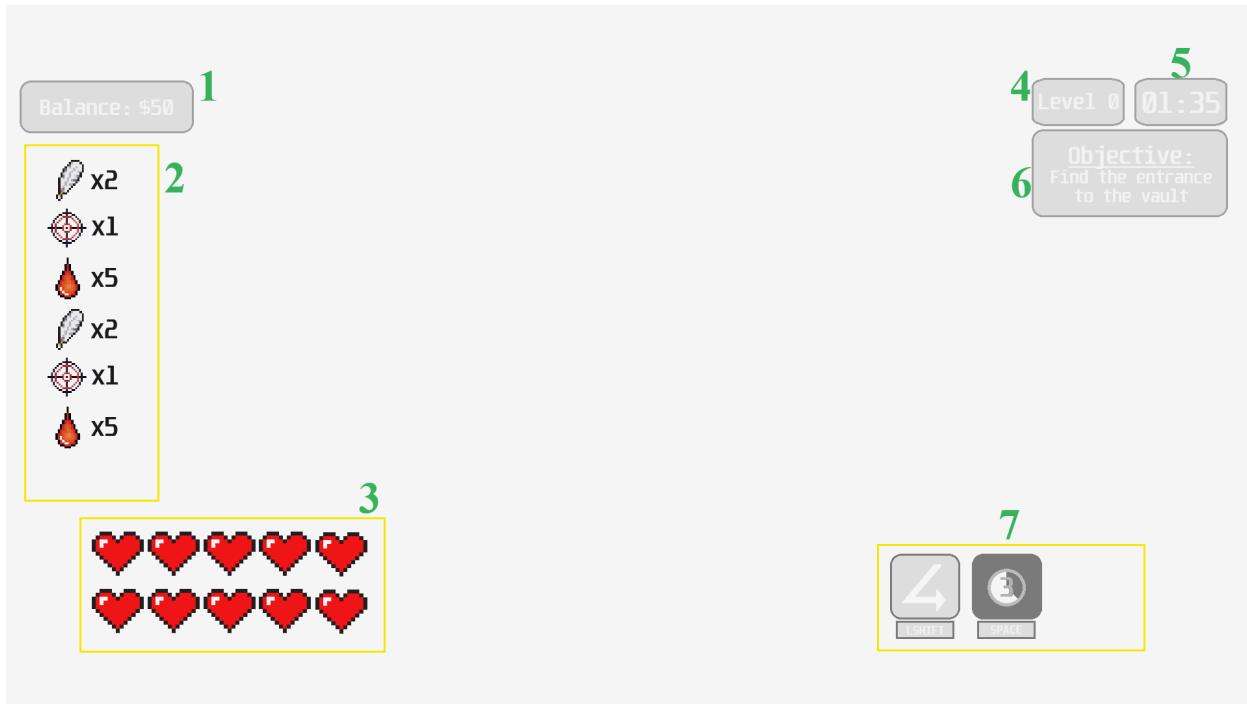


UI Mock-Up

UI with no labels:



UI with labels:



Labels:

1. **Currency counter:** Displays player's current balance in numerical form, with "Balance:" text to give context. Goes up and down as the player picks up and spends currency.
2. **Power-ups list:** Lists the player's current active power-ups received from opening chests. Number next to the power-up displays how many of each power-up the player currently holds.
3. **Health bar:** Displayed in icon format. More icons appear as the player collects health-boosting power-ups. Hearts become empty outlines when the player takes a hit of damage.
4. **Level name:** Displays the name of the current level the player is on.
5. **Timer:** Displays the current timer for the playthrough. As the timer goes up, gameplay elements such as enemy spawning change (becomes more difficult).
6. **Objective:** Displays the player's current objective. Changes after the player completes the current objective.
7. **Ability icons:** Display the player's current unlocked movement abilities along with the keybind that is associated with them (slide and double-jump icon shown in mock-up). If the ability is on cooldown, the icon disappears and is replaced by a timer which displays when the ability becomes re-available.

Other notes:

- Yellow boxes show bounding boxes for different elements of the UI. They do not actually appear in the HUD in-game. Differences in when these boxes are full vs. when they are not can be seen between the two UI images posted above.
- Power-up and heart icons are not the exact art we will be implementing. Art was taken from other sources as inspiration for what we will be creating. Other power-up icons will also be drawn as we come up with more ideas.
- Ability icons (7) can be seen when on cooldown w/ timer in the second image above.

Control Scheme (PC)

- W: Move Forward
- S: Move Backward
- A: Move Left
- D: Move Right
- Space: Jump
- Space + Space: Double Jump
- Left Mouse Button: Attack
- LCtrl: Crouch
- LShift: Slide
- E: Interact

Human-Computer Interaction Implementation

- In CST-320 we learned the importance of making games intuitive for both people who are used to games and technology and people who might have never played a video game before. To account for this, we are making our UI easily readable and obvious so the user is never confused about what is going on and where they should go.
- We also learned that a UI should match the overall tone and setting of the game, so since our game takes place in the far future in a virtual environment, the UI will also have a lot of sci-fi and technological elements, shapes, and themes.
- Due to CST-320 being primarily centered around VR, it was important for the controls and keybinds to be intuitive enough so that you could press them without actually being able to see the controllers. From this, we have made our key binds the standard key binds for most computer games to allow the controls to feel familiar to players and also allow for multiple actions to be performed at once without having the user play Twister with their fingers trying to press different keys.