

CISC 226  
Project Proposal: Frostfall  
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Group 25

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## **1. Key Concept:**

"Frostfall" is a 2D vertical platformer where players control a rugged mountaineer navigating a challenging, winter mountain and castle setting using a grappling gun and pickaxe as tools. Players must also engage in combat with enemies being rewarded for precision and timing of attacks, enhancing the overall strategic gameplay. The main goal is to reach the end of the map by defeating bosses and overcoming obstacles. "Frostfall" targets players aged 10-30, offering a progressively challenging experience while remaining accessible to players of varying skill levels.

## **2. Novel Idea:**

### **Unique Gameplay Mechanics**

The most novel aspect of our game is the varying movement mechanics. Most notable is the grappling gun, which creates a tether from the player to a point on the map, allowing for swinging movements. However, this motion is dependent on momentum, which is provided by an omnidirectional boost system. This boost is controlled by player input, determining the direction and intensity of the swing. The grappling gun is the primary source of vertical movement, this is followed by an equipable pickaxe that allows players to hang from vertical cliffs. Combining both the grappling gun and pickaxe allows the player to vertically traverse various terrains such as ice and snow blocks. Each tool on its own has specific capabilities, but when used in tandem, opens up a wider range of vertical movement options. These gameplay mechanics are innovative in how they add a 2nd approach to movement within the game. Traditional platformers usually only allow horizontal movement with very limited vertical action. With the grappling gun and pickaxe, players will spend the majority of the level climbing upwards. This dynamic vertical approach also provides us as developers with more freedom when designing levels and environments.

### **Strategic Placement of Exchange Points and Checkpoints**

Exchange points will be strategically placed across the map, each offering unique items, and encouraging players to explore different areas. This not only incentivizes player exploration but also incorporates item collection and item upgrades into the game. This adds a whole new level of strategy and diversity. Our game features a single initial checkpoint located at the beginning of the map. If the player dies they will respawn at this initial checkpoint, where they can use the existing currency to purchase upgrades, making subsequent attempts easier, and significantly reducing the repetition of challenging sections. Additionally, other map locations will offer purchasable checkpoints, presenting the player with the option to invest currency into upgrades and respawn points or save it for the possibility of a more optimal path to completion. As stated exchange points offer more than just upgrades for the player's abilities; they also provide an opportunity to purchase checkpoints. These checkpoints are a critical strategic element, allowing players to save their progress. Pre-existing checkpoints exist across the map however, letting players purchase them at milestones they deem most important adds a whole other decision-making aspect to the gameplay.

### **3. Gameplay Outline:**

#### **a. Macro Level Gameplay**

At the macro level, our game is focused on the player navigating through a series of progressively more challenging vertical environments. The player's primary goal is to navigate through these environments using the tools they've obtained, overcoming obstacles and defeating enemies to reach the end of the level. Along the way, they collect in-game currency to purchase tool upgrades, player enhancements, and respawn checkpoints.

#### **b. Micro Level Gameplay**

At the micro level, or 10-second span of play, the player engages in movement-to-movement actions using their pickaxe and grappling gun for quick vertical traversals of objects. The player might navigate a challenging vertical ascent using the grappling gun for a quick upward movement, then switch to the pickaxe to climb an ice face. If an enemy is encountered, the player must perform quick and precise attacks all while dodging incoming hits and assessing the enemy's attack patterns. Micro gameplay is fast-paced requiring players to constantly assess their situation and react accordingly to a constantly evolving environment.

### **Level Design**

The fundamental game concept is a 2D vertical platformer. The core objective is to move the player between different levels in the environment. Levels are characterized by platforms of varying heights that require the player to jump, climb, and grapple to traverse. The platformer will be mostly vertically traversed, with some limited horizontal traversal. Vertical traversals, i.e., when the player is climbing using a pickaxe, will be presented from a 2D rear camera view. Grappling, jumping, and running will be presented from a 2D side view.

Levels will be designed to challenge the player's skill in navigation and resource management. Verticality will be the core focus, with some horizontal navigation to provide pacing variations. Levels will be non-linear, such that there isn't an obvious path to follow. Allowing players freedom while traversing the map and encouraging the development of their own unique playing style.

The environment will be composed of different types of tiled blocks such as normal tiles which can be grappled onto, icy tiles which cannot be grappled onto, resulting in the player sliding, and snow tiles which must be scaled using the player's pickaxe. Varying tiled platforms with large gaps, drop-offs, and ledges force the player to utilize their different tools to traverse the environment.

## **Level Progression**

The game will have a progressive difficulty curve. Starting with simple challenges and mechanics as the levels progress enemies and obstacles gradually become harder. Environmental hazards like ice slides and blizzards will also add complexity as the player advances. Player progression is tied to mastering the game's mechanics rather than character upgrades or game currency, emphasizing skill and strategy.

The main goal of the player is to reach the end of the level. This goal is accompanied by subgoals of navigating the map and fighting enemies, each of which needs to be fulfilled to reach the main goal. Optional side goals include purchasing upgrades and respawn checkpoints using currency obtained from defeating enemies. Completing a level requires the defeat of a boss, forcing the player to showcase their skill and power and ensuring they are ready for the next level.

## **Variable difficulty progression system**

Our game introduces a variable difficulty system, the player begins with relatively basic abilities such as limited movement speeds, attack power, and no special abilities. As players defeat enemies they earn in-game currency, which is retained through respawns. This currency can be used at designated checkpoints and exchange points throughout the map to enhance players' abilities. This system caters to all players: skilled players can challenge themselves by foregoing upgrades, while those being challenged by the game can utilize the upgrades to make things easier. This unique approach allows for diverse player styles, accommodating players with varying skill sets and making the game more enjoyable for all players.

## **Characters**

The main character is a rugged mountaineer. An initial concept has been depicted below, the character is depicted holding a pickaxe and has a grappling hook on their belt. The character is dressed in a large beige coat and wearing a hood. They are equipped with spiked boots for navigating slippery terrain. Their face is obscured by a ski mask, leaving only their eyes visible. The character is shown with a pickaxe in hand for scaling icy surfaces and a grappling hook attached to their belt for swinging and reaching higher platforms.



Figure 1: 2D Arctic Rugged Mountaineer Character (ChatGPT 2024)

## **Character Development**

As players progress through levels the mountaineer character unlocks different tools. Starting off the character has no tools and can only run and jump. The pickaxe and grappling gun are then unlocked and equipped through level progression. These tools can also be further upgraded to enhance their abilities and effectiveness. The pickaxe can be upgraded to chip through tougher ice more quickly or to grant the player the ability to cling to walls for longer periods. The grappling hook can be upgraded to extend its reach and target more points quicker. These tools are not only essential for progression through the increasingly challenging levels but also serve as key elements in the game's mechanics. Allowing these tools to be upgraded provides the player with an enriching gameplay experience that progresses in numerous ways.

## **Enemies**

The game features three types of distinct enemies.

Flying enemies have superior air mobility and will aggressively charge at players using various attack patterns. Players will be required to skillfully use the grappling gun to evade these attacks. However, these enemies have longer delays between their attacks, leaving them vulnerable to counter-attacks from the player.

Grounded enemies possess limited ranged attacks and will be positioned on platforms. Players will either have to avoid and dodge these enemies or employ a parry technique (striking the enemy just before their attack lands). Players will have to adopt a more offensive fighting style against grounded enemies as opposed to flying enemies.

Large enemies or bosses have a unique characteristic allowing players to grapple onto body parts. Damage can only be inflicted at certain "weak spots" on their bodies, some of which become apparent only during specific openings. These enemies have larger health pools and are tougher to defeat than the other enemies. Their attack patterns can include a mix of ranged and melee attacks, and some may have the ability to fly.

Each of these enemies will provide varying in-game currency that can be used to purchase respawn checkpoints and other upgrades, as mentioned earlier. The amount of currency earned from each enemy is based on the enemy's difficulty level and the player's progress within the level. This promotes a gameplay style where taking greater risks leads to greater rewards.

## **Combat**

Our combat system is also novel in its approach, by rewarding accuracy and discouraging the spamming of attacks. Player attacks are followed by a cooldown period, a common element in combat systems. However, our game introduces a unique twist on this mechanic, if a player successfully lands an attack on an enemy, the cooldown period for the next attack is reduced.

This rewards precision and good timing, challenging players to be more strategic in their combat decisions.

## Environment Design

The main set of the platformer is the winter mountain and castle that the player is attempting to scale. The environment ranges from icy cliffs and snowy ledges to castle walls and towers. The changing landscape is also accompanied by an unpredictable weather system that changes throughout progression.

The game prominently utilizes tile sets to create the world, with each set carefully designed and created to reflect the harsh winter environment. They will include icy and snowy surfaces that are slippery and difficult to navigate. Rocky terrain and protruding ice formations will also provide natural platforms for the player to navigate. The verticality of the levels will be emphasized throughout the towering ice cliffs and castle walls. Larger modular castle elements will also be created to facilitate the creation of more complex features throughout the world. Some small example elements are pictured below.



Figure 2,3: 2D Arctic Castle Platformer Game (ChatGPT 2024)

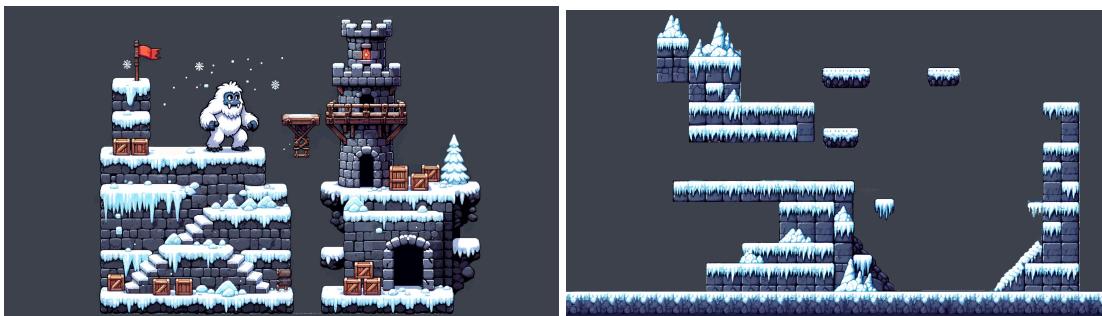


Figure 4,5: 2D Arctic Castle Platformer Game Tile Sets (ChatGPT 2024)

## Background

The game's background graphics will also encompass the winter and arctic landscape. These concepts will revolve around a snowy and icy mountain range and at other points will involve a very large castle. This differentiation in backgrounds will be made when the player reaches checkpoints throughout the game. Below is a concept background.



Figure 6: 2D Mountain Range Backdrop (ChatGPT 2024)

#### 4. Target Platform:

Development on Unity allows the release of builds on many platforms including PlayStation, Xbox, PCs, mobile, extended reality (XR), and websites. In unity, a build is a method used in C and C++ software development to speed up the compilation of projects by combining multiple translation units into a single one, usually achieved by bundling up multiple source files into one larger (executable) file. The chosen target platform for our game is Windows with x86\_64 architecture, and Mac/Linux standalone. All inputs into our game will be through keyboard and mouse. The game's architecture allows for expansion onto mobile platforms such as Android and iOS, but this is a feature that will likely have to be implemented outside the term development time frame. We will also be deploying using Unity's supported WebGL onto game distribution software such as itch.io as users can appreciate not having to download a whole package of files just to play a single game.

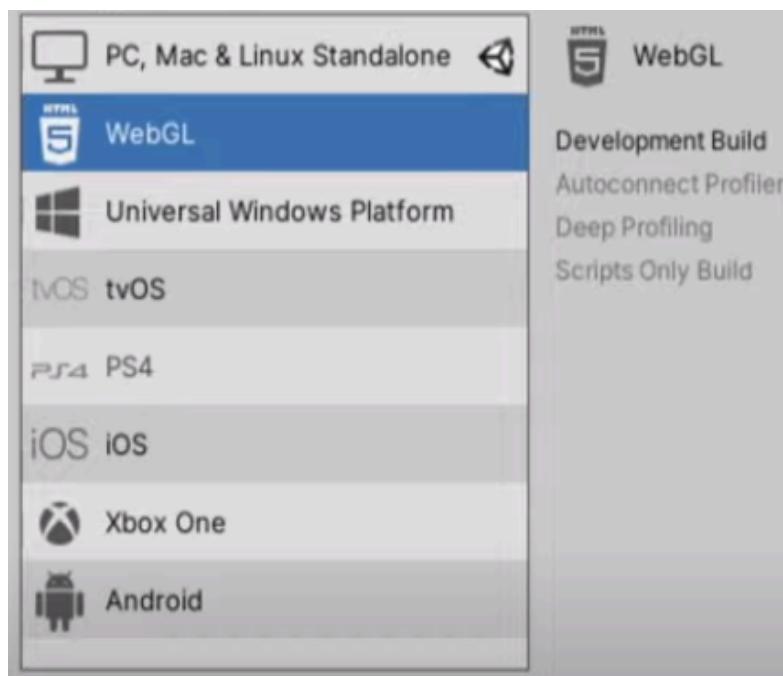


Figure 7: Demonstrating supported build release platforms on Unity

The key controls for the game are described in the following table.

*Note: that these are the proposed key controls and are subject to changes.*

Action	Key Control
Grapple Aim	Mouse pointer direction
Grapple Action	Mouse pointer click
Jump (charge)	Up arrow key (hold to charge)
Attack	"F" key
Dash	"Z" key
Move Left	Left-Arrow-Key
Move Right	Right-Arrow-Key
Interact	"V" key
Climb (with pickaxe)	Up-Arrow-Key

Our game is intended to require a linearly increasing skill level, starting easier allowing the player to gain experience with the gameplay mechanics. It is targeted towards players aged 10-30 who enjoy immersive and evolving challenges, particularly those who seek to enhance required skills over time. As players advance, the game becomes more difficult and increasingly more demanding, testing players' skills. This design choice ensures that while the game is accessible to beginners, it remains engaging and challenging for more experienced players.

## 5. Development Tools:

For the development of our game, we have chosen several versatile tools to help our team be as efficient as possible throughout the development process. We have chosen Unity as our game engine, this will be accompanied by programming done in C#. For version control and code collaboration, we're considering GitHub or GitLab. We plan on initially creating a GitHub repository but have considered GitLab as a backup/alternative in case our project size exceeds the limitations of GitHub. The creation of our game's art assets will be done using Adobe Photoshop and Paint.NET. To streamline our project management and keep track of tasks, we will use Trello, a customizable Kanban board, that allows us to organize and prioritize features updates, and bugs in a collaborative environment. By integrating these tools, we hope to create a seamless and efficient workflow.

## **6. Group Coordination Plan:**

The group is to have one virtual meeting per week via Discord and is to be attended by all members. It will be held whenever all group members have a free hour, usually on Thursday evenings. Continuous communication of progress and updates will happen through Discord, allowing other members to give feedback on recurring issues/bugs and important changes. By using Git for version control, we will be able to share and collaborate on all code written for the game. When all members are available, we will book in-person rooms to discuss prominent issues or bugs that need to be tackled. The majority of tasks will be assigned to multiple members, allowing multiple perspectives to be applied. A team member will take the lead on a project or task but will have assistance from one or more other team members. This allows for real-time peer feedback and review, creating a more cohesive and seamless game as our result. All team members will actively contribute to the development of code for the game, however, only specific team members with experience and comfort in graphic design and illustration will engage in the art asset and environment development/creation. To further enhance coordination, our group will maintain thorough documentation throughout our code base to ensure all team members can efficiently understand and follow the contributions of other team members. We will also implement progress tracking tools such as Kanban boards, to ensure timely completion of tasks.

### Works Cited

2D Arctic Rugged Mountaineer Character. OpenAI. (2024). ChatGPT (4) [Large language model]. <https://chat.openai.com>

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2D Arctic Castle Platformer Game Tile Sets. OpenAI. (2024). ChatGPT (4) [Large language model]. <https://chat.openai.com>

2D Mountain Range Backdrop. OpenAI. (2024). ChatGPT (4) [Large language model]. <https://chat.openai.com>