# Introduction

## Abstract

The purpose of the project is to publish a 3D game with graphic shader functionality. The unreal engine is used for the development of the real-time game. The game’s genre is an Action RPG Roguelike and the goal is to escape from a dungeon with a co-op combat system.

## Executive Summary

There are over 73,000 games published on Steam and the number of games released on Steam is increasing every year. Team have to represent a model that is following public interest in general, but have to be unique in a way so that the game is attractive. Some contents in the game must be regulated before publishing such as hate-speech, copyright, and more.

# Motivation

## Competitive Analysis

| Game Title | Feature | Image |
| --- | --- | --- |
| [Darkest Dungeon](https://store.steampowered.com/app/262060/Darkest_Dungeon/) | * Turn-Based Combat * Rougelike * Unique drawing * 2D Game |  |
| Summary:  The Darkest Dungeon is a challenging roguelike turn-based RPG with unique gothic 2D drawings. The successful feature of the game is the psychological stat system in the game such as horror, stress, and disease that increase and sometimes decrease the difficulty of the game. This feature helped the game to gain popularity as difficult game but also upset players because of too much unfair randomness that leads to mostly negative events. Thus, it is recommended to think a model that is more fair and not too random. | | |

| Game Title | Feature | Image |
| --- | --- | --- |
| [Warriors: Rise to Glory!](https://store.steampowered.com/app/582330/Warriors_Rise_to_Glory/) | * Turn-Based Combat * Rougelike * Online Co-Op * Multi-player * Comedy |  |
| Summary:  The Warriors: Rise to Glory! is a rogue-like turn-based combat game. In the game, you create a gladiators with different styles and fight against enemy in the arena. The successful feature of the game is customizable character with various items and meme to entertain players, but some memes are outdated and arkward. It is encouraged to add adding more items to customize the character as free as possible, and put more recent parody to entertain players. | | |

| Game Title | Feature | Image |
| --- | --- | --- |
| [Monster Hunter: World](https://store.steampowered.com/app/582010/Monster_Hunter_World/) | * Real-time Combat * Co-Op * Multi-player * Action * Open World |  |
| Summary:  Monster Hunter: World, is a real-time combat game. The game is open world using everything from disposal of the monsters to hunting down stronger monsters in the world by teaming up with other players. The successful feature of the game is great action with vivid combat effects and smooth movement. The downside of this game is too much repetition to gather items for upgrade. If possible, it is promised to reference the movement and effects in this game to improve combat effects in the team's game. | | |

## Journal Articles

| Title: [Game Recommendation System for Steam Platform](https://gcris.mef.edu.tr/bitstream/20.500.11779/1721/1/Serhan%20Bayram.pdf) |
| --- |
| The steam main dataset includes about 65,000 unique users and 8,000 unique games. According to the author, 93.78% of games are paid and 94.64% of paid games priced under $20. Moreover, 32.9% of games are not played for even an hour. Steam uses implicit feedback or, hours played, as a more accurate measure of user preferences than explicit ratings on actual games in their algorithm and the study is conducting that the user tend to find similar games they are owning.A challenge in recommendation systems is the "cold start" problem, where new users or items lack sufficient data for accurate recommendations. Therefore, the system aims to develop strategies to promote lesser-known or newly released games. |
| Our goal is to not only create a game, but also successfully upload our game to the Steam platform. In order to be selected from Steam algorithm, it is important to implement similar features from previously uploaded games because users in the Steam platform are likely to looking for similar games. It is important to follow basic features of the “Rougelike”, but it is challenging to increase play-time unless there is a unique feature. One consideration is to add outstanding game stroy. Moreover, it would be justifiable to set the price of game to be free since the goal is to attact more people to play. |

| Title: [GameFlow in Different Game Genres and Platforms](https://dl.acm.org/doi/pdf/10.1145/3034780) |
| --- |
| A general model for player enjoyment that has been used in evaluating video games across genres and platforms. The GameFlow consists of eight main criteria including Challenge, Player Skills, Control, Clear Goals, Feedback, Immersion, and Social Interaction. The GameFlow is initially developed to assess real-time strategy games, but the author expands the use of GameFlow beyond strategy games, applying it to first-person shooters and adventure games on different platforms. Overall, concentration and immersion are crucial to player enjoyment across genres but the authors suggest it should evolve to accommodate new gaming trends, particularly in multiplayer. |
| The Immersion is a concept that the players feel deeply involved, losing track of time and surroundings. In roguelikes, death is permanent, meaning that players lose all progress and have to start from the beginning. This sense of challenging pushing players to be fully immersed in their decision-making process, however, it is also dangerous since when the character is dead players are likely to lose all interest right away. It is our goal to set up the gameplay to be balanced that is challenging but also not too easy to play. Moreover, we should consider whether the player can continue with partial progress or force to completely start over from the beginning. |

| Title: [Design Your Rules-A Roguelike Designe](https://www.atlantis-press.com/proceedings/cdsd-22/125984875) |
| --- |
| The author introduces the core characteristics of a roguelike game, such as randomness and permanent death, and discusses how these elements are evolving. The game allows players to modify its rules, offering diverse strategies and outcomes. Modern trends in roguelike design include multiple game modes, such as 2D RPGs where players fight monsters in a grid-based environment or card games where players use identity cards with special abilities to gain gold coins. Players can also customize their victory conditions by progressing through stages and gaining cards that define new rules for each session, creating a distinct experience every time. While these changes provide more varied experiences than traditional roguelikes, maintaining game balance and keeping players engaged remain key challenges. |
| Important goal to design a roguelike game is to make the gameplay balanced and keeping players to be interested to play the game. The trends in roguelike is improving by adding new features to the game and not just keeping the basic core of the game such as randomness and permanent death. It is our job to find a way and redefine the roguelike. One consideration is story-telling that immerses players in a dynamic narrative, where each decision impacts the plot and progression. Another consideration would be unlimited customization with limited time, where the user can edit their characters with their choices and compete against each other in time-based challenges. This could add a sense of urgency and strategy, allowing players to explore different builds and tactics in a condensed timeframe, keeping the gameplay fresh and competitive |

# Requirements

## High-level Description:

The product that we will develop will be a rogue-like action game created with Unreal Engine. It will include a custom shaders system created by our team that will create lighting and special particle effects.

## Functional requirements table

| **ID** | **Title** | **Requirement Description** | **Date** | **Done** |
| --- | --- | --- | --- | --- |
| F1 | User Interface | Users will interact with different interfaces in the game such as main menu screen, pause screen, options screen, etc. | 9/17/2024 |  |
| F2 | Character Stats | The user has stats about their player such as health bar and attack and defense levels | 9/17/2024 | X |
| F3 | Controllable Player | The user has an in-game character that they will be able to control by moving, attacking, and interacting with the in-game world | 9/17/2024 | X |
| F4 | Enemy Characters | The user will have adversary characters that will try to attack the player and that the player will have to fight off during gameplay | 9/17/2024 |  |
| F5 | Gameplay Tasks | During gameplay, the user will have to complete tasks to progress within the game | 9/17/2024 |  |
| F6 | Multiplayer Functionality | The user and another user will have the ability to play together co-op style | 9/22/2024 |  |

## Functional requirements description

**F1 User Interface**

In our video game, the user will interact with different menus and interfaces to help them navigate through the game and explore possible options. These interfaces include menus such as the pause screen, main menu, and settings menu. These interfaces will be user-friendly and provide the user with options such as customization, beginning the game, and leaving the game.

**F2 Character Stats**

The playable character that the user will be controlling throughout gameplay will have real-time statistics available about their character such as health, attack level, and defense levels.

**F3 Controllable Player**

The end user will have a character that they control throughout gameplay which they will use to physically navigate through different levels, interact with the environment they are in, and attack adversaries.

**F4 Enemy Characters**

The user’s playable character will have one or more adversary units that will try and harm the player and disrupt their progress through the game. Enemy units will be programmed to systematically try and break down the main character's health and try to end the player’s attempt at completing the level.

**F5 Gameplay Tasks**

Users will have tasks during gameplay that they will need to complete in order to unlock and complete certain levels. The users will have to strategically balance fighting off enemies whilst completing tasks at the same time.

**F6 Multiplayer Functionality**

The user will be able to play co-op with another player on the same screen to work together to complete the game. This is an optional functionality, users can play as a single player if they wish.

## Non-functional requirements table

| **ID** | **Title** | **Requirement Description** |
| --- | --- | --- |
| NF1 | Engine | The game will use Unreal engine as the backbone for the backend |
| NF2 | Programming Language | The C++ and Blueprints programming languages will be used for the application |

## Non-functional requirements description

**NF1 Engine**

The engine that the video game will run on is Unreal engine. Our team will utilize plugins and extensions available on the Unreal engine to enhance gameplay.

**NF2 Programming Language**

Our scripts will be made using C++ as we have the most experience with it compared to other languages, we will also use Blueprints to make implementing those scripts easier

# 4. Design Document

## UML diagram

## Paragraph

# 5. Prototype

# 6. User Study

## Interview Questions

1. How much time can you typically dedicate to playing games in one session?
   1. Less than 1 hour
   2. Between 1 to 3 hour
   3. More than 3 hour
2. Do you prefer games with a strong story or ones that focus more on gameplay?
   1. Story
   2. Gameplay
3. Do you enjoy single-player or multiplayer experiences more?
   1. Single
   2. Multiply
4. How do you feel about randomness in item drops?
   1. Like
   2. Dislike
   3. Does not matter
5. Do you prefer long-ranged or short-ranged combat for the main character?
   1. Long-ranged
   2. Short-ranged
6. How would you your characters to be like
   1. Casual
   2. Video game
   3. Action

## Demographics

| Name | Age | Gender | Q1 | Q2 | Q3 | Q4 | Q5 | Q6 |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Yoori Whang | 18 | Female | B | A | A | B | A | C |
| Mattew Han | 32 | Male | A | B | B | B | A | C |
| Diane Han | 29 | Female | B | A | B | B | A | C |
| Takashi Hayashima | 37 | Male | B | B | A | A | A | A |
| Tae Jin Kim | 42 | Male | B | B | A | B | B | A |
| Jilson Interiano | 29 | Male | B | B | A | B | A | B |
| Minyoung Kim | 40 | Male | B | A | B | B | B | A |
| Luis Angel Bernardo | 50 | Male | A | B | B | C | A | A |
| Carlos Lopez | 20 | Male | C | B | A | B | B | B |
| Juan Montalvo | 44 | Male | B | B | B | B | A | A |
| Tomonari Kojima | 55 | Male | A | A | B | C | A | C |

| Gender Distribution  Male: 9  Female: 2 | | Chart | |
| --- | --- | --- | --- |
| Age Distribution  10 - 19 = 1  20 - 29 = 3  30 - 39 = 2  40 - 49 = 3  50 - 59 = 2 | | Chart | |
| Question#1  How much time can you typically dedicate to playing games in one session?  A) Less than 1 hour  B)Between 1 to 3 hour  C) More than 3 hour | | Chart | |
| Question#2  Do you prefer games with a strong story or ones that focus more on gameplay?  A) Story  B) Gameplay | | Chart | |
| Do you enjoy single-player or multiplayer experiences more?  A) Single  B) Multiply | | Chart | |
| How do you feel about randomness in item drops?  A) Like  B) Dislike  C) Does not matter | | Chart | |
| Do you prefer long-ranged or short-ranged combat for the main character?  A) Long-ranged  B) Short-ranged | | Chart | |
| How would you your characters to be like  A) Realistic  B) Humorous  C) Casual(cute) | | Chart | |

## Results

Based on feedback from our semi-structured interviews, we gathered important insights that help refine the design of our roguelike game. The majority of players reported having only 1 to 3 hours available to play games at a time. One stage in the game should be designed with difficult level or need to implement multiple stages with easy task to comple. Most players expressed a preference for gameplay over a story. This suggests that we should prioritize implementing and polishing game mechanics, player controls, and in-game systems. While a basic story can provide structure, the core of the experience should revolve around engaging gameplay rather than complex narrative development. The feedback was evenly split between players who prefer single-player and those who enjoy multiplayer. This indicates the importance of offering both modes, if possible. Implementing a multiplayer feature could appeal to a broader audience while still preserving a strong single-player experience for those who prefer to play solo. Majority of the players responded randomness in item drops was generally disliked. Players want more predictability in terms of loot and rewards. Designing each stage with fixed drop rates and difficulty levels would enhance the sense of control and strategic planning, improving the overall experience. Players should feel that they can overcome challenges with skill rather than luck. The majority of players preferred long-ranged combat over short-ranged combat. This means that long-range combat should be a central focus. However, short-ranged combat should not be neglected, as there will still be a portion of players who favor this style. Players tend to prefer either realistic or cute characters. We need to decide which direction the art style of the game will be. We can design a characters with a more real appearance or cute for the both main characters and enemy characters. A clear art direction will enhance the overall appeal and consistency of the game.

In addition to the question feedback, there are several issues were identified with the current state of the game. Players mentioned that the character's actions feel stiff and lack fluidity. More motion variety and smoother transitions between animations are needed to make combat and movement more immersive. Moreover, enemies are too static as well and do not present enough challenge or variety. Adding more action patterns to enemies will increase the dynamic gameplay. There is no background art or a detailed story in place. Even if the players prefer gameplay over story, having some basic background story of the world can make the game feel more polished and give players context for their actions. The fixed camera makes the game feel less immersive so more dynamic camera movment with the action will satistify visual experience. Players expressed that the game lacks unique abilities or skills, which are expected in roguelike games. Implementing character abilities can add depth to the gameplay and give players more strategic options. In our current state, the game is not standing so that the players reported they would not spend time playing it. We need to focus on making the gameplay, art style, and features more distinct and memorable to attract and retain players.

# 7. Accessibility Conformance Report

# 8. Team Reporting

## Team tasks chart

## Team commit chart

Jae Min Whang:

* Week 6:
  + [Commit\_I](https://github.com/Draftyjester/ProjectRogue/commit/0176b71cb3287cce5e621afeb1f9dd9949e401c8)
    - AI implementation with chase and attack
  + [Commit\_II](https://github.com/Draftyjester/ProjectRogue/commit/01ea6291d14a3ad33da97054baae1373d12e5010)
    - Zoom in/out and change view from top-down to third-person
* Week 7:
  + [Commit\_III](https://github.com/Draftyjester/ProjectRogue/commit/01ea6291d14a3ad33da97054baae1373d12e5010)
    - Combat system with damage motion and reflecting health bar

## Success Report

# 9. Conclusion