

# The Far Journey

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## ABSTRACT

UPDATED—November 29, 2022. Our project is a 3D real time game in the Unreal engine. The game is a fantasy genre in a medieval setting. The game will have 3 levels in it. It will have a variety of enemies and weapons. There will be magic. The different types of magic for the player to use would include pyromancy and sorcery. There will be a class system that has two classes. The two classes are the Mage and the Warrior. Each level will have a boss enemy in it.

## Author Keywords

Authors' choice; of terms; separated; by semicolons; include commas, within terms only; this section is required.

## 1. INTRODUCTION

To introduce this project we decided to develop a game, and the game will have the title of "The Deep Journey." This game is in the first person. The general setting is that of medieval fantasy, and it will have 3 different levels. The first level will be where the character will start out in, and it will be the castle level. The castle includes two courtyards and middle building. The second level will be the castle's dungeon which will have holding cells for enemies and middle room where the main boss is. The third level will be the fort area which will be a walled structure with small buildings. The main building for the level will be a tavern which will hold the boss. The character player will have different types of weapons to choose from which will include hammer or staffs. The character player will be facing off against different enemies types including orcs, and wolves. The character will also be able to wield different kinds of magic. There will be two different types of magic the character can wield pyromancy and sorcery.

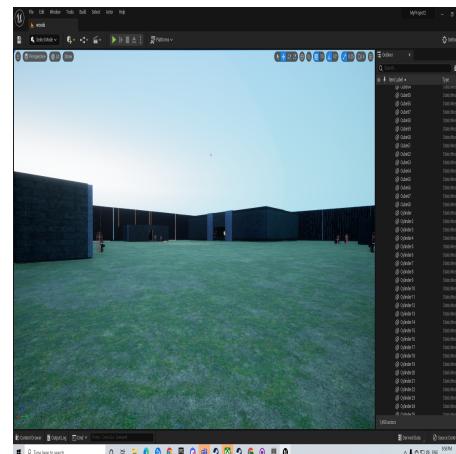
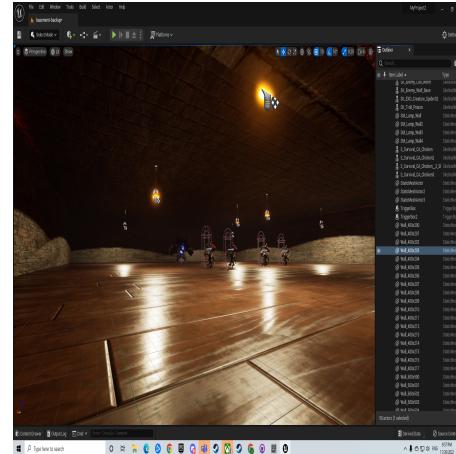
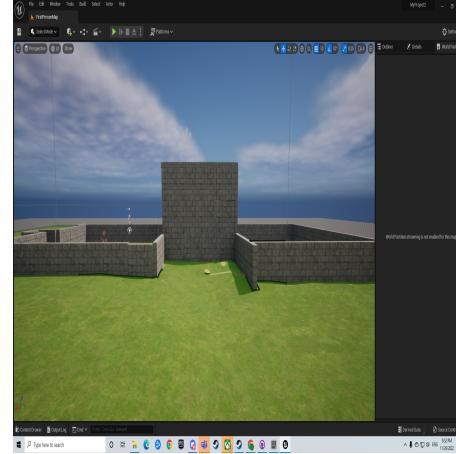
## 2. TECHNICAL SPECIFICATIONS

We are using Unreal Engine for our project. We will be using C++ and blueprints in Unreal and behavior trees for the AI. Behavior trees are essentially used to create AI by having branches that decide actions. Blueprints will be used in places that require simple execution such as taking the player to a new level. An example would be the AI just searching and then it will execute a different branch when it finds someone. GitHub is being used for collaboration with each other and version control. All the assets that are currently being used is in the unreal store.

## 3. LEVELS

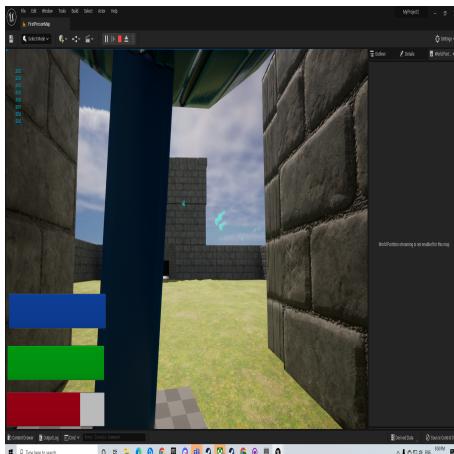
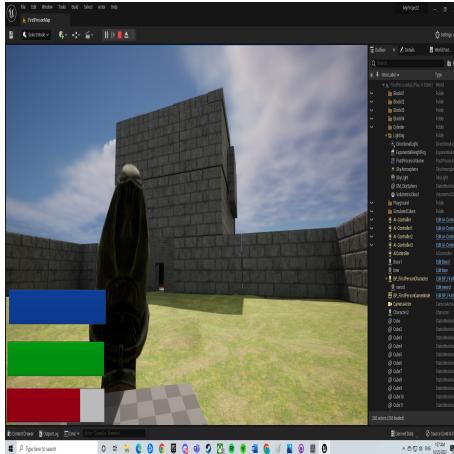
There are three levels in this game. The first is the castle area and it was the first one made. It is two court yards and a main building each courtyard will have some smaller enemies for you to deal with. The Middle building will have two stories. The first one is just a way to get to the other court yard, basement level, and upstairs. The second level will hold the boss enemy for the level. The second level is the basement/dungeon. It is a smaller level with just two holding

cells and a backroom for the boss and some enemies. The third level is a bigger level with a bunch of small buildings in an enclosed space. It has wolves and orcs next to the building with a tavern in the back with the boss.



## 4. CLASSES

We made two classes for the game the mage and warrior. The warrior was the first class that was made and is the more simple of the two. Its first ability is just a heal ability which is useful for staying alive since you have to be in melee combat. The second ability is a damage buff which will give double damage to his attacks. The third ability is his ultimate which gives health regeneration to the player. The mage class is the range dps class. The first ability sends out fast moving disks in front of the player. The second ability shoots a fireball which does a lot of damage which is useful for the bosses in the game. The ult will regenerate the players resources to cast more spells.



## 5. WHAT WE LEARNED

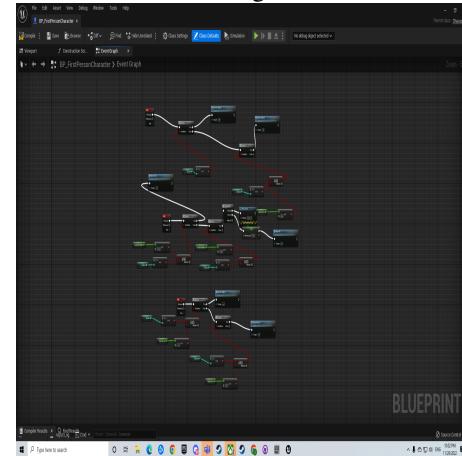
This section will cover what we learned over the course of making our project. Over the semester we learned about game development within unreal engine 5. Unreal engine is made by Epic Games and is free to use. We also learned how to go about making a game and all the steps that require it. Making the game involved a whole host of different things like having to plan out the different levels within the game, choosing an overall art direction for the game, deciding on what kind of enemies the player will go up against, and the different abilities the player character will have. Something else we learned how to do was create custom animations within the unreal engine. The enemies and their ai that is used to make them work was

something else we learned. The player characters' different projectiles and weapons that can be used were implemented. An interface for the player character that shows the players health, magic, and ultimate ability was made.

## 6. MECHANICS

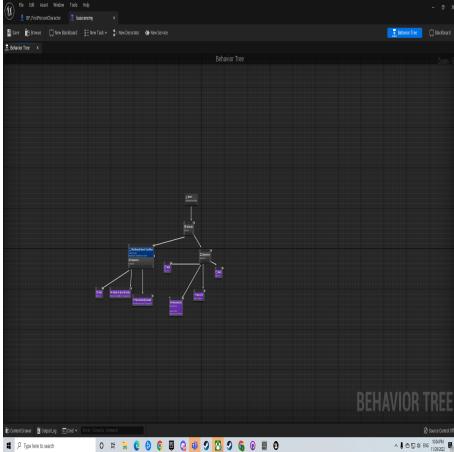
### 6.1 blueprints

The major blueprints that were made were dealing with the classes. The projectiles used were changed blueprints of the original projectile. Things that were changed about it were the damage numbers gravity and speed. The class systems for the warrior used changing of simple variable values to achieve the effect of healing similar effects were done for other values such as resources and ultimate bars. The damage buff ability was achieved by having a damage buff variable and having it change from 1 to 2 and having it affect weapon damage. The only problem I had with that was the casting to player character which took finding more information about casting online. The mage abilities used similar blueprints since it was just spawning the projectile and the only thing that was different was the damage numbers and the cost in implementing. Overall the blueprints were very modular since you could reuse the code to do different abilities and projectiles. The ultimates were just having a timer run over different variable to regenerate that bar.



### 6.2 AI

AI was a little tricky since at first I just had simple blueprints to do basic tasks such as see and move towards the player. That later changed when I learned about behavior trees. All a behavior tree does is choose paths and execute commands. Example of commands used is turn to face player and walk towards player. The movement is basically the ai finding a spot nearby and moving towards it until it sees the player. The AI will make the enemy move towards the player. This part of the project was difficult, and we had to use a tutorial made by unreal to get more information about behavior trees and get basic functionality.



## 7. TRIALS AND TRIBULATIONS

Over the course of creating and perfecting the project certain issues were encountered. Even though we used github for our version control and collaboration we still ran into using where work was lost. Another issue encountered was the differences in performance specifically gpu power between our personal machines complicated development. Some of the concepts were difficult such as the ai. There are also a lot of options on the blueprints and objects so it was easy to get overwhelmed by it. Implementing the classes was tedious since choosing a class and a weapon can not be on the same keybind for some reason. The class ultimates were difficult since loops are awful in the blueprint system and would throw a no end condition error. We had to use timers which are much better to deal with.

## 8. FUTURE WORK

There are some areas in our project that we weren't able to implement and could be considered future work. The first idea we had was porting the game to mobile. This is possible because unreal engines work cross platform. More levels being added was something else we would like to do in the future. Adding more enemies and weapons for the player character to use could also be worked on later down the road.

## 9. PROJECT DEVELOPMENT

The project started with just a map that later became the empty castle. At first it was just messing with the toolkit to figure things out. I later added enemies that just stood there and then later they would move randomly. We started working on the second level which became the basement level since it seemed to transition well. The levels after the castle stay stagnant since we started to focus on the mechanics of the game. It first started with the ai which was a nightmare to work with so we switched over to working on the class system since it was easier. We added a warrior class with abilities such as healing, damage buff, and a regeneration ability. The ultimates required us learning about timers since they were required to make it work. The mage was the next class made which had different spells it could use. The spells required us to make more projectiles that have different stats. We then shifted focus back to the ai and got them to start moving round and attacking the player. Melee weapons were added close to the end of the project development.

## 10. OPINIONS ON PROJECT

The project was overall helpful for learning about a new toolkit and it forced me to look for help online when I ran into trouble. Example the ai was difficult since it required multiple blueprints and something called a black board. It also required making a ai controller for the enemies to use. We would have never figured that out unless we looked online for help. We also need to look up tutorials for the ai and the UI. Unreal does not really show you how to do things on its service.

## 11. CONCLUSION

To conclude over the semester with our project we were able to make a playable first person action game. This game was called the deep journey and was developed using unreal engine 5. We used the blueprint system within unreal engine 5 to deal with the different player classes and connect the levels using trigger boxes. The project development started out with just one level and by the end we had three distinct levels with different enemies the players could fit using their classes abilities. The project helped us learn game development and the new toolkits we needed to use. We have improvements and additions to the project that could be completed in the future. Overall this project was a fun way to demonstrate our resourcefulness/work ethic as computer science majors and showcases how we can use the knowledge we've procured over the years to accomplish great things.

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