

Summary

Karma is a First-Person Shooting game that gives players an awesome FPS experience while exploring different maps, skills trees, and customizable elements in RPG crawlers.

Code Metrics

Lines of Code: 25559
Number of Scripts: 235
Commits: 614

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Karma

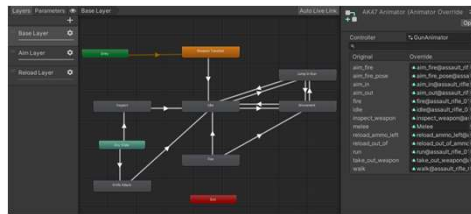
Poly Gamers, CSE5912, Spring 2022
Hongda Lin, Baihua Yang, Jason Lian



FPS System

Instead of using the Asset, we decided to write our own FPS System from scratch, for better customization and collaboration between scripts.

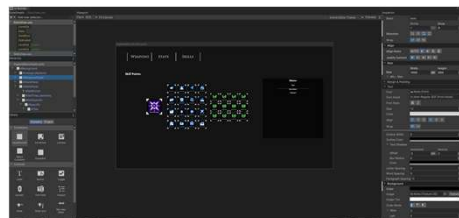
- (1) Apply CharacterController as basic control.
- (2) Use Unity New Input System for player inputs.
- (3) Create three Animation Layers transits between Moving, Shooting, and Reloading.
- (4) Utilize Polymorphism between Gun classes.
[ex: Firearms -> AK47, Glock, MP5...]
- (5) Centralized weapon control by writing WeaponManager.



UI Design

Different from using the traditional UGUI, we boldly tried to develop our entire in-game UI using the most advanced UI development tool: UIToolkit.

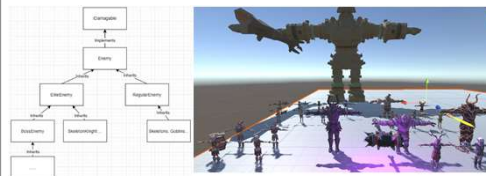
- UIToolkit is like designing a web page, however, because the relevant resource is limited, the development process is the most difficult part in the entire game .
- Able to make cool UI effects, like fading, frosted glass, animated inventory, etc.



Enemy AI

To have an awesome FPS experience. We made 22 different enemies that is difficult enough for players to challenge.

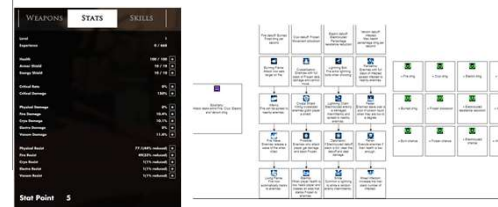
- (1) Controlled using Navmesh Agent.
- (2) Utilize Polymorphism between Enemy classes.
[ex: Enemy -> Elite Enemy -> Archer Goblin]
- (3) Categorize enemy into three different type: Regular, Elite, and Boss.
- (4) Regular enemy implemented without root motion enabled. Elite enemy has applied root motion for better animation results. (ex: dodging, skill attack...)
- (5) Enemy behaviors include wander and patrol.



Stats & Skill System

Skill, Looting, Level up are commonly found in RPG games.

1. Player could increase their stats while killing monsters.
 - The Stats system allows player to customize their health, armor, damage, resistance...
2. While leveling up, player also earn skill points.
 - The skill tree system contains 1 main skill, 16 debuff skill, and 12 buff skill.
 - Skill have different elemental type.
3. Enemy will drop weapons and attachments in different rarity.
 - Top rarity attachment could unlock powerful attachment skills.



Level Design

The game consists of three levels. Players need to find the hidden teleporter at each level and defeat the boss in order to process to the next level.

1. There are respawn points in each level, player could use them to restore health and ammo. The respawn point is also a data save point.
2. Hint is another way we guide player to proceed with our game.



Saving & Loading

Utilize Unity Serializable and Microsoft DataContract and DataMember to transform game data to the format of class GameData.

- Use BinaryFormatter to serialize GameData when local saving and deserialize when loading.

