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Week 7 – Software Engineering

NPC UML State diagram

NPC — Description

The NPC is a character in the game that has the ability to function on its own without input from the player. Its behavior is sporadic acting without any forethought. A lot of its decisions are based on chance— for example, the logic in its *looting* class is dependent on a random number. This value decides whether or not the NPC loots an item in a specific room. The NPC shares inventory with the main controllable player, meaning if the NPC loots an item, it is automatically appended to the player's(self) inventory.

Deciding the state of the NPC

With the NPC acting as teammate, to make the game harder, he has a lower chance of attacking zombies and looting, to make the actual player be forced to be the one doing these game progressing actions. In order to pick a state, the main class will first check if there is an item even available for the npc to pick up, if there is not, the loot state will simply be excluded when randomly picking a state, similarly the NPC is not able to attack if there is nothing to attack, so if there is nothing to attack as well, that state will also be excluded when randomly picking a state. Keeping all that in mind, there is a 40% idle chance, 40% move chance, 15% attack chance, and a 5% loot chance. The state changes every turn, although states can be repeated, they are not hardcoded, they are simply randomly picked every time, directly after the turn of the playable character.

States — IDLE, MOVE, ATTACK, LOOT

IDLE

The NPC enters the *Idle* state according to the *Idle* chance (40% chance the NPC enters the *Idle* state) Once the NPC leaves the *Idle* state, it cannot return.

LOOT

The NPC is able to loot items. This state is only possible if there is an item in the room to loot. This state has a very low probability (5% chance) of happening, since it greatly benefits the playable character.

Some rooms contain items in locked *subrooms*. If the NPC attempts to access an item in a locked *subroom*, the game will output a message saying 'the NPC failed since the

room was locked.' Alternatively, if the NPC attempts to access an item in a subroom that has been unlocked by the player, he is able to do so.

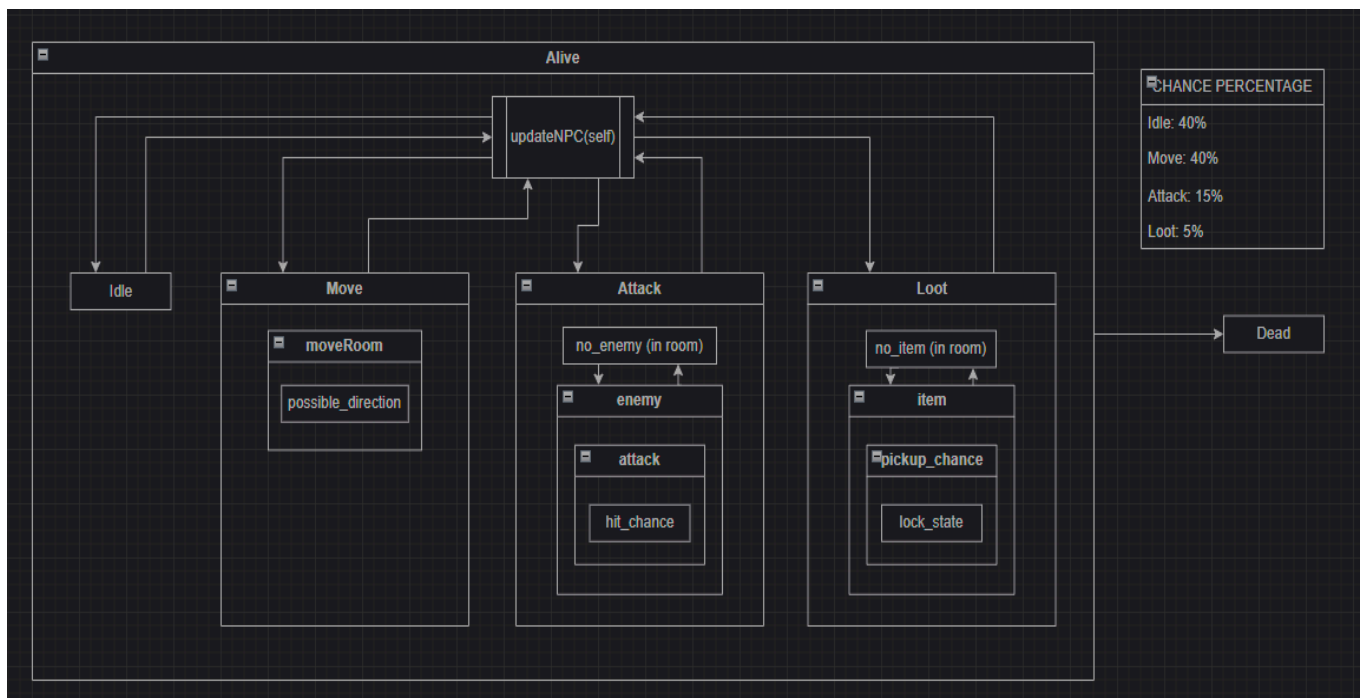
MOVE

This state allows the NPC to move between rooms. Every room leads somewhere meaning the NPC can not reach a dead-end. Therefore, this state can always be called. Like the playable character, the NPC can only make legal moves. I.E. the NPC cannot teleport from the attic to the basement. Every turn he would have to make one legal move making him closer and closer to the attic, until he arrives there.

ATTACK

The NPC is attacking a zombie. This state is only possible if there is a zombie in the room to attack. His damage will be randomized each attack. If the attack state is called, the game will call the combat class.

NPC UML State Diagram:



Also submitted as a .jpeg separately