AI assessment Chase game plan

By Joseph Huskey

**Project Overview**

I plan to make a 3d platformer chase game where there will be an enemy ai that is fleeing from the player firing shots that create obstacles and spawn enemies to chase the player. The player will fight back against this AI using attacks that remove the chasing enemies or slow down the main enemy.

**Behavior overview**

I’ll be creating a behavior system that will generate a grid with enemy bots and a player on it, and I will use steering behaviors and A\* pathfinding to help the bots move around.

**Pathfinding Solution**

I will use A\* pathfinding to make guesses as to how to get to a target optimally based on which tiles are better by ranking them and sorting to make a guess on the fastest path there. This way the Runner AI won’t be running away from the player off the grid.

**Decision Making Overview:**

There are two main finite state machines in this project one for the runner AI and one for the chaser AI. These will simply determine the AI’s behavior at any given time.

Runner AI:

If the player is too far from the runner, they will change to the pursue behavior unless there are too many obstacles nearby. If the player is too close to the runner AI they will flee occasionally switching to an attack behavior if the player doesn’t have a high chance of catching them.

Enemy attack types planning:

An attack that removes a floor tile.

An attack that spawns an enemy that will chase and eliminate the player once they get too close to the enemy.

Finally, an attack that spawns a simple block the player and enemies need to run around or jump over. Enemies can’t jump.

Chaser AI:

This will be the most simple AI in the game they will chase after the player using exclusively the pursue behavior except they will also have a detection object on them that will let them know of obstacles on the grid.

**Third Party Graphical Framework**

I’ll be using Unity 3D version 2019.3.6f1 for this project.

**Suitability**

Using Unity is suitable for this project because Unity offers a lot of different UI objects that make it easier for me to develop and test the tools for this project.

**Technical Impact**

The only thing that will be impacted for this project by using Unity will be the use of their game object, and vector math systems for some of the pathfinding calculations.

**Licensing**

Unity 3D TOS <https://unity3d.com/legal/terms-of-service>

**Additional Third-Party Libraries**

No additional Libraries currently

**Underlying Mathematical Operations and Algorithms**

**Mathematical Operations**

Currently No formulas outside the normal.

**Advanced Operations**

Currently I plan for my project to have a finite state machine that will be based on how far away a player is, and how many obstacles are in the way of a given direction. I plan on using a switch statement to determine the action by changing the case value depending on the situation.

**Research Material**

Currently no research material

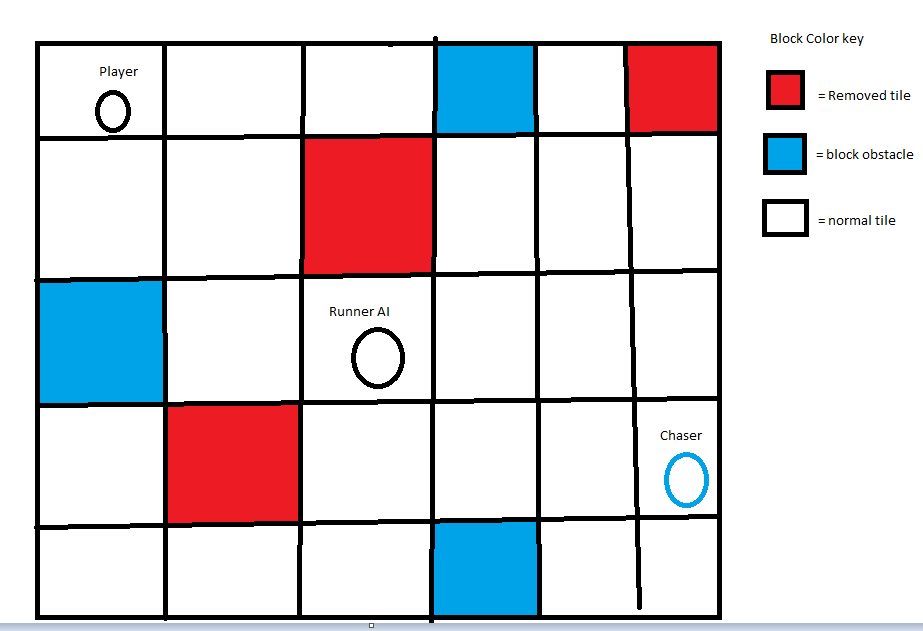
**Technical Risks**

Currently no known risks

**Credits**

Joseph Huskey ®2020

Obstacle/basic map diagram(not to scale and not final, just to help conceptualize)

Diagram for the Runner AI state machine

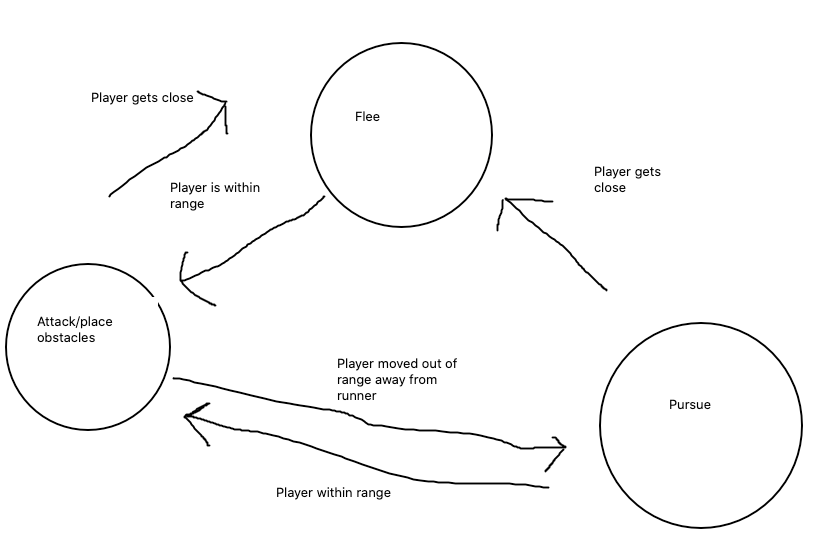


Diagram for the Chaser AI state machine

