Grand Canyon University

Project 7 – Things Are Not What They Seem

Justin Dietrich and Ryan Scott

CST-415: AI in Games and Simulations Lecture & Lab

Dr. Ricardo Citro

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A brief description of the game or simulation (one paragraph)

1. Our game will be from a top-down view, set in an environment that has paths, walls, and other types of cover or obstacles. The player can move around the environment, trying to eliminate enemies while trying not to get eliminated themselves. Project 7 features a revamped spawning system that uses conditional independence and variable elimination to identify key places to spawn enemies, just outside the Player’s field of vision.

How are the concepts listed above relevant and its purpose? (one paragraph)

1. In Project 7, we spawn enemies in varying locations depending on circumstance, as opposed to the guaranteed spawner locations from before. This gives the feeling that “things may not be what they seem”, as the Player never knows where the enemies will come from next. Possible factors to account for when determining an enemy spawn include the Player’s location, enemy concentration, and past spawns. Certain variables such as enemy locations and item locations correlate to where the player is most likely to go next.

Which search method will be used? (one paragraph and bullet points outline)

1. Bayesian network (use this for spawning enemies in good positions). Certain variables will be analyzed, some affecting chances of some and some affecting chances of others. It will all boil down to the chance of where the player is most likely to travel, which is the area the enemy will be spawned.

Reference: <https://en.wikipedia.org/wiki/Bayesian_network>

Github: <https://github.com/AsePlayer/CST-415>

Example Scripts

Direction chance()

If (health kit nearby)

If (player health < max health)

Chance of getting health kit +

Else normal chance of getting health kit

If (enemy in direction)

chance of continuing in direction -

Chance of continuing in direction += chance of getting health kit

How will you overcome unforeseen obstacles during implementation? What is your 'plan B'?

1. If we cannot implement a large Beyesian network, we could just use a small one with maybe 4 variables. Simplifying to lower expectations is always a good plan B. This is also better for us computationally in general, as we won’t have as much to account for.

How is the project aligned with the current topic objectives?

1. The project shows that we can create a functioning Bayesian network. It will have a couple chance tables that affect other chance tables. It will all lead up to the final chance table that we require, which is the one that predicts where the player is going to travel to.

What will appear on the screen: animation, user interactions, information dashboards, UI elements, etc.

1. Project 7 features a proper “How To Play” UI, explaining the controls of the game with accompanying visual clarification. This was a necessary step in making the game more user-friendly for people playing for the first time.

List the platform and software tools you plan on using

1. Stuff we will use:  
   Unity (with C# scripts)  
   Adobe Photoshop  
   Adobe Illustrator  
   MS Paint  
   Audacity

Screenshots below:



