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B1: Navigation Basics

26 February 2020

Report

Github: https://github.com/vobos2/NavBasics

1. Describe your braking mechanism for agents:
    - The agents measure distance between themselves and decrement speed when the brake distance threshold is met. The agents also measure distance between the goal position and themselves to know when to decelerate/accelerate.
2. Describe a way for implementing how an agent can avoid obstacles without carving.
    - Without carving an agent can avoid obstacles by using navigation static and setting navigation area to not walkable (or increasing cost of the weighted plane) before baking the NavMesh.
3. Explain the difference in behavior between carving and non-carving options for a NavMeshObstacle. When and why should you use carving? What is the issue with making all obstacles carving? What is the issue with making all obstacles non-carving?
    - The difference in behavior between carving and non-carving options for a NavMeshObstacle is that non-carving obstacles won't dynamically update the NavMesh if their position changes.
    - For example: With carving, if a cube moves from its initial position after baking, the NavMesh will update itself so that the agents know to avoid its new position when planning the route and see the initial position as walkable. Without carving, the agent will assume the area that is now blocked by the cube is still walkable and avoid the area the cube was in initially.
    - The issue with making all obstacles carving is they will be updating at runtime, so with more obstacles you will need more computing power and memory. Also, if the obstacle is a sliding door and there is only one way to get past it then carving could throw off auto re-planning while it's closed, since the path becomes invalid. Whereas with a navigation static obstacle the agents will remain at the door until it opens again.
    - The issue with making all obstacles non-carving is that you can't have objects that move during runtime if you expect the agent to plan a path around them.