Procedural Dungeon AI User Manual

AI Dungeon made in Godot 4.1

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Getting Started

Welcome to this application of a Procedural Generated Dungeon made in Godot 4.1.
The purpose of this game is to watch an AI Agent move from point A (Spawn) to point B (Target) whilst using the A* algorithm for finding the best path available in the Grid. This process can be quite taxing for your computer and maybe it'll be difficult to understand so let's get going with this User Manual.

How does it work?

This project implements several algorithms included in the Godot inside methods like A* Pathfinding, Delaunay Triangulation and other various utilities.
A* Algorithm is an implementation of Dijkstra's Algorithm that implements heuristics between the nodes.
Delaunay Triangulation it's a given set P of discrete points in a general position is a triangulation DT such that no point in P is inside the circumcircle of any triangle in DT.
With the use of these, we can create a graph with the points on DT that will be used for the GridMap inside the game.
It works in three parts.
The first one being the Delaunay Triangulation used to implement the GridMap.
The second being the dungeon creation that takes the GridMap and makes Cell Meshes on top of the GridMap former created.
The third and last will be the Agent AI spawning at a random room of the dungeon and a target objective that it's spawn will also be a random room. The agent will walk to the target using the best path possible of the dungeon.

Computer Requirements

Let's hope you meet the minimum requirements:

- 128 MB RAM
- 100 MB Available Space

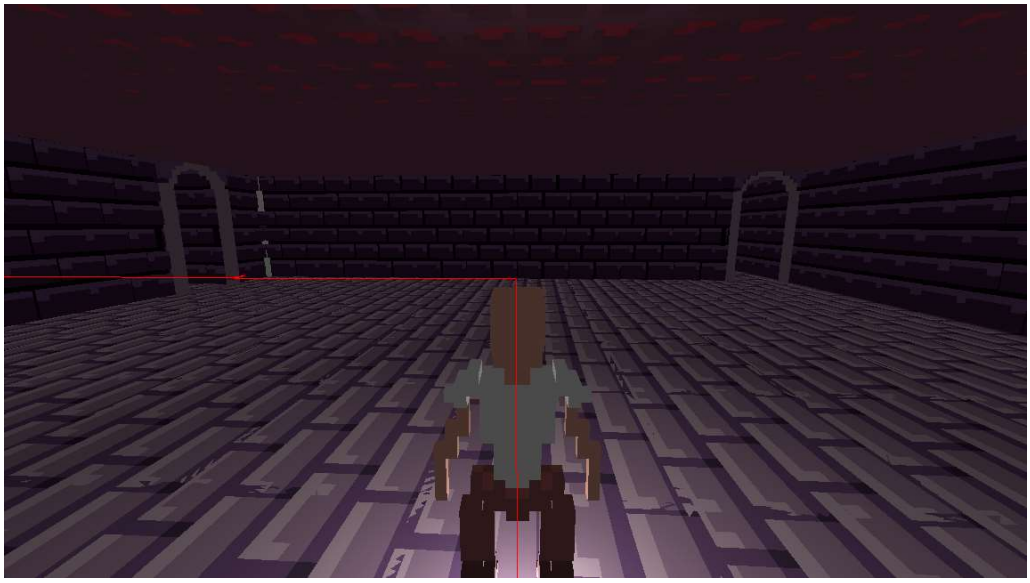
If you meet the minimum requirements, you can go through with the download.
Everything will be in the GitHub repository at:

https://github.com/Farionsg/Godot_Procedural_Dungeon_AI

Running the Game

For now, we'll focus on the ProyectoU1.exe that comes in the repository folder. Opening this executable will launch the game and you will be presented with a simple interface telling you to press "enter" to start, this will begin the Agent AI pathfinding process as you can see in the screenshots.
The whole game will consist on starting and watching the Agent AI walk to the target and each time you run a new instance, the dungeon will be different from before and the spawn and target positions will also be different at random.

You'll see the dungeon, the Agent AI, a red line which shows the path the Agent AI is following and the UI.



Controls

It should be easy to understand how to work the game with a simple UI.

Pressing:

- ENTER Key: This will restart in a new instance
- SPACEBAR Key: This will pause the game.

Using the Editor

As you saw in the requirements, to make changes to the game you'll need to use the Godot 4.1 Editor.
Godot is an open-source game engine that uses its own programming language which consist in a node base system.

The first thing you have to do is open the editor and Import (Figure 1).

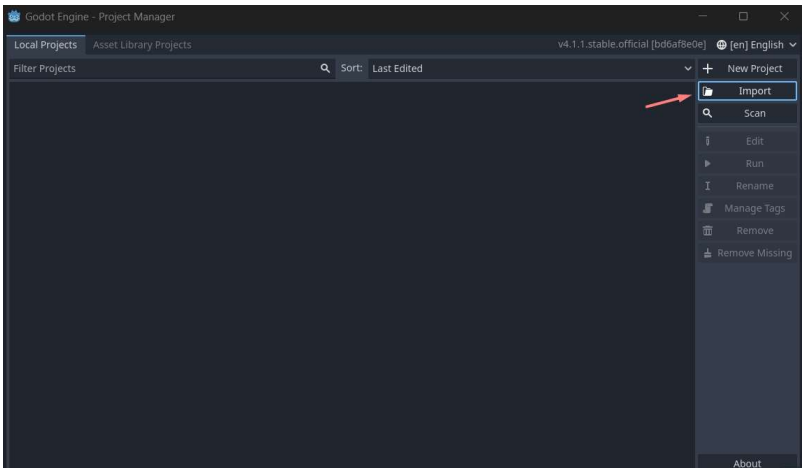


Figure 1

Then you'll travel to the path of the folder you downloaded from the repository and select the file that says project.godot, that will open the project on the editor.

Navigating the editor can be quite difficult for a new user but we'll just focus on the main scene.

Inside the editor we will travel to the bottom left and make our way through res:// -> DungeonGeneration -> dun_gen.tscn (Figure 2). We'll need to double click this scene so it will open in the editor.

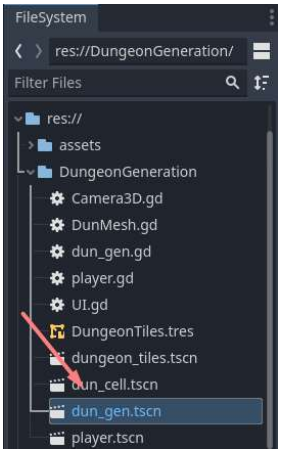


Figure 2

Inside this scene you'll be presented with many other options like the 3D Editor, the scene configuration on the left or the Inspector on the right, but we only want the latter. After selecting DunGen from the scene configuration we'll notice that the Inspector changes with new options as shown in the picture (Figure 3)

Figure 3

All of these are made for tweaking the game. Here you will be able to edit the Border Size, how many rooms we want, the margin between rooms and the size. You can also assign a seed to the dungeon so it will always form the same way whilst the seed is there.
You can also click the Start option so you see your changes on the editor instead of having to run the game every time you make a change.