

OpenMap

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What is OpenMap?

'*OpenMap*' is a work in progress **Unity3D** Editor extension. It is a tool that helps in the creation and management of environments. This is done through a grid system while staying very flexible. The main aim of *OpenMap* is in speed development of an environment, with this tool a user is **able to literally paint** and erase and then manipulate GameObjects in the Unity Editor. Along with this basic idea of 'painting' there are other features and tools that help in the creation and management of the map being made such as layers, selection tools, macro zooming and nested prefabs.

Features

There are several features being implemented into and many more planned for OpenMap. These are ones that have been or are being implemented:

Painting - Creating - Replacing - Size - Rotation

The main and core feature of OpenMap is the way in which you can place GameObjects into the Unity Editor Scene. After creating a map all is set up. The mouse become a very accurate brush to fill in the grid. A part of this feature is that it will take the real space dimensions size of mesh with applied scale to calculate the best fit size for the object and fill that space. This then leads to bigger objects replacing ones that it covers and rotating around the center of the space. Painting is very efficient and fast and can be done with large maps and when the grid is small and zoomed out.

Deleting (Erasing) - Replacing - Eraser

Deleting is the counterpart to Painting. OpenMap is being designed to be optimal as well as functional. This means that, like mentioned before, objects that overlap will be removed from the Scene and replaced with the new object. The tool has also an implemented for just deleting. Working just like Painting the mouse can be used to get rid of Objects that have been placed on the Map and in the Scene.

Layers - Multiple / Unlimited - Protected

An integral part and useful feature is the ability to create layers. Like in a digital imaging-editing program OpenMaps when working in one layer others layers are not affected by the editing tools. This way maps can be full to the brim without worry.

Grid - Visible - Relative - Color - Alpha

With every map comes a visible grid to show where pieces can be created. This grid is created to size which is as big as one want. This grid is relative and by using a detection plane with it objects can be created on the map at any angle, so rotation and scale do not affect were the object is created. If the mouse is clicked inside of a box the object will be created there, though sometimes is visually tricky (though there will be a feature that will benefit this). The grid of course can be adjusted in color and transparency so that clarity can be achieved.

In Scene GUI - Accurate - Quick

Generally Unity3D Extensions are controlled through the Editor or a separate window. While this was the way originally done OpenMap developed in Scene GUI so that when making a map focus never has to leave the work area. The GUI is accurate and non intrusive. It has the basic editing tools and have lead to a few new ones. The GUI will end up being custom made to be as best as possible.

Selection - Time Saver - Integrated - More Accurate

Just developed was a selector tool for OpenMap. Unity3D's selection tool works fine for a three dimensional 'unmanaged' space. However how the selector behaves does not intuitively, nor accurately, work with the visuals of of a gridded map. With the developed selector just by selecting the grid do objects get selected, this then gets sent to Unity's selector and so is integrated and provides a familiar control afterwards, and is in fact faster than using Unity's selector (it is less laggy). The selector also has been incorporated into other features like a Fill or 'Area Paint' function to fill-in large areas and setting objects for the Camera Macro.

Random Generator - Useful - Intuitive

Included is a random generator using two or three objects a layer of the map can be filled with them. Using sliders that adjust with each other it becomes an easy and intuitive process of setting the probability for each piece. Also you can leave one blank and have it keep spaces open. With this tool layers can be quickly filled and given texture or even used to randomly place objects quickly across the map.

Zoom Macro - Quick - Structured yet Open - Focused - Adaptable

A tool included is the Zoom button and is used along side the selection tool. After selecting a part of a layer by using the Zoom button the Scene View moves into focus on that particular object. All other objects are hidden so only what is selected can be worked on. Even though there are arrows to rotate around the objects Unity's own navigation tools are welcome. Using the button with an eye will toggle on and off the surrounding objects. Once done by clicking the Zoom button again the Scene View will revert to the view it had before Zooming in. This is

useful when working on a larger area and you can Zoom in and out incredibly fast without having to navigate the 3D space. Also the Zoom function knows how big the selection is so that all of what was selected can be seen.

Nested Prefabs - Exporting / Importing

OpenMap uses empty game objects to organize all of the map contents. However if you try to take the map outside of the Scene and putting it into the Project folder you are taking the whole map with it. This is because Unity does not support Nested prefabs and this new prefab has no link to any prefabs that might have been used in the map. This makes it a big file and prefabs no longer update. But by using the Save and Load features of OpenMap you can export a small prefab of the map that then can be used in another scene and loaded up with prefabs that are correctly linked.

Real Time Management - Autonomous

OpenMap tries to be as ready as can be and updates according to changes. One example of this is if you delete an object normally OpenMap knows that object is no longer part of the map. Also adding objects under any of the map objects does not lock up the system and Layers can be deleted without harming the structure of the map. There are other features like supporting multiple maps in a scene and turning them off when not being used.

Layer Management - Control

Layer Management is for more detailed managing of layers. This means a way to delete and add layers easier and through the Scene GUI. Layer merging is also an idea.

Previewing - Speed - Accuracy

A simple helper function to show things before they are set. Mainly for when painting the cursor is a mesh already loaded and when making a map show the grid size. This mesh is shown at the actual scale and rotation of the object and the area it will displace. The cursor mesh can be either in a wireframe mode or a colored solid mode with transparent (wireframe has no transparency). With this also the scroll wheel rotates the object so that going back to the Editor panel each time is no longer needed.

Future Features

These are features that are planned for implementation.

3D Layering

This will be a way to have different levels where objects are placed. The height of the level can be set and can be as many levels as wanted. Levels can be separate or linked through the different levels.

Nested Objects

Just as objects are made as nested prefabs via painting them, objects can be dragged in normally and linked to a layer or to an object. This way objects that do not need to be tiled are used or need to be more organically placed can take advantage of being nested.

Editor for Map Controller

The map object has a script attached that holds all the references and settings of the map. Currently it is just a script. By having an editor made for the map controller it can be made safer since settings and objects can be changed what are not tracked and an editor would hide those. Also basic functions could be provided, such as layer adding and removing, without having to open the Map Editor Window.

Undo

This is a basic function and feature that needs to be implemented. It has been tried several times but only with minimal success. Undo works for area painting and random generation since undoing the whole scene is easy to do. However this is too slow for painting and erasing.

Grid Sizing

Being able to adjust the size of the grid for the map is another basic feature. Also there is the possibility of having layers having their own grid sizes too. The only issue with getting this in is that much of the framework of the editor is based on a static size, thus tedious and prone to breaking once switching over.