RUNTIME TERRAIN EDITOR

Getting Started

Thank you for buying this asset!
This documentation will explain the project structure and will walkthrough over how to modify and add custom content.

Motivation

Unity Terrain is a rapid and powerful tool to create your project scene environment. But it's limited to Unity Editor itself. There is no official solution to use it in runtime/playmode.

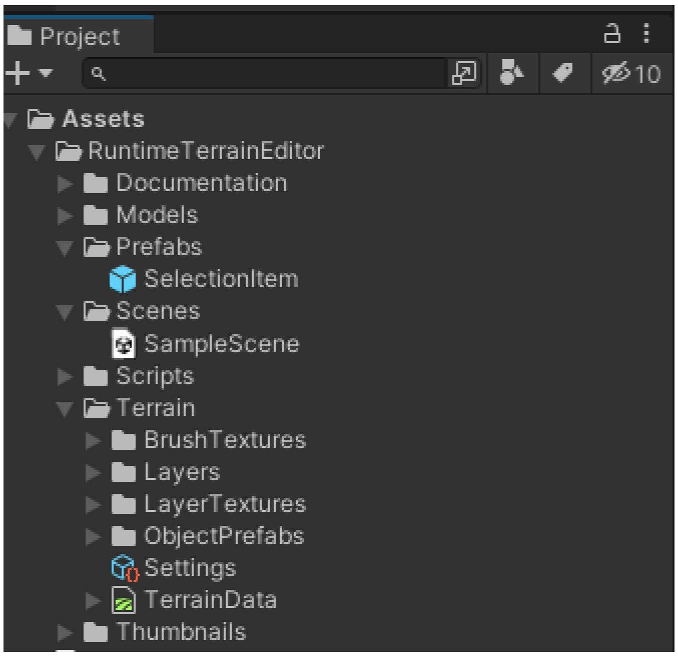
This package aims to utilize the Unity Terrain API and demonstrate how to make a runtime terrain editor to achive the idea of providing such tools in runtime.

Also, I used this project as a base to create my own sandbox application, Map Sandbox.

`Note: This project uses Legacy Input and Legacy Unity UI components for the sake of simplicity.`

Example Scene Breakdown

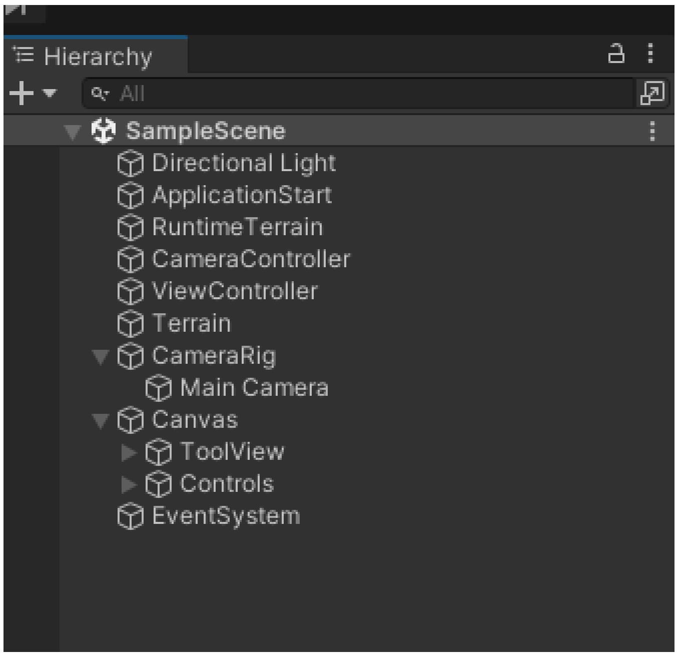
This is the project structure



```
Project
Assets
  RuntimeTerrainEditor
    Documentation
    Models
    Prefabs
      SelectionItem
    Scenes
      SampleScene
    Scripts
    Terrain
      BrushTextures
      Layers
      LayerTextures
      ObjectPrefabs
      Settings
      TerrainData
    Thumbnails
```

Open the `ExampleScene` from `Scenes` folder.

Let's take a look into hierarchy.



ApplicationStart

System entry point. Initialize the controllers and `RuntimeTerrain`.

RuntimeTerrain

Holds reference to target terrain and settings.

CameraController

Listens for camera movement related inputs.

Navigate:

- WASD
- Arrow Keys
- Hold Mouse Right Click

Rotate:

- Q and E (Horizontal)
- Middle Click (Horizontal)
- CTRL + Middle Click (Vetical)

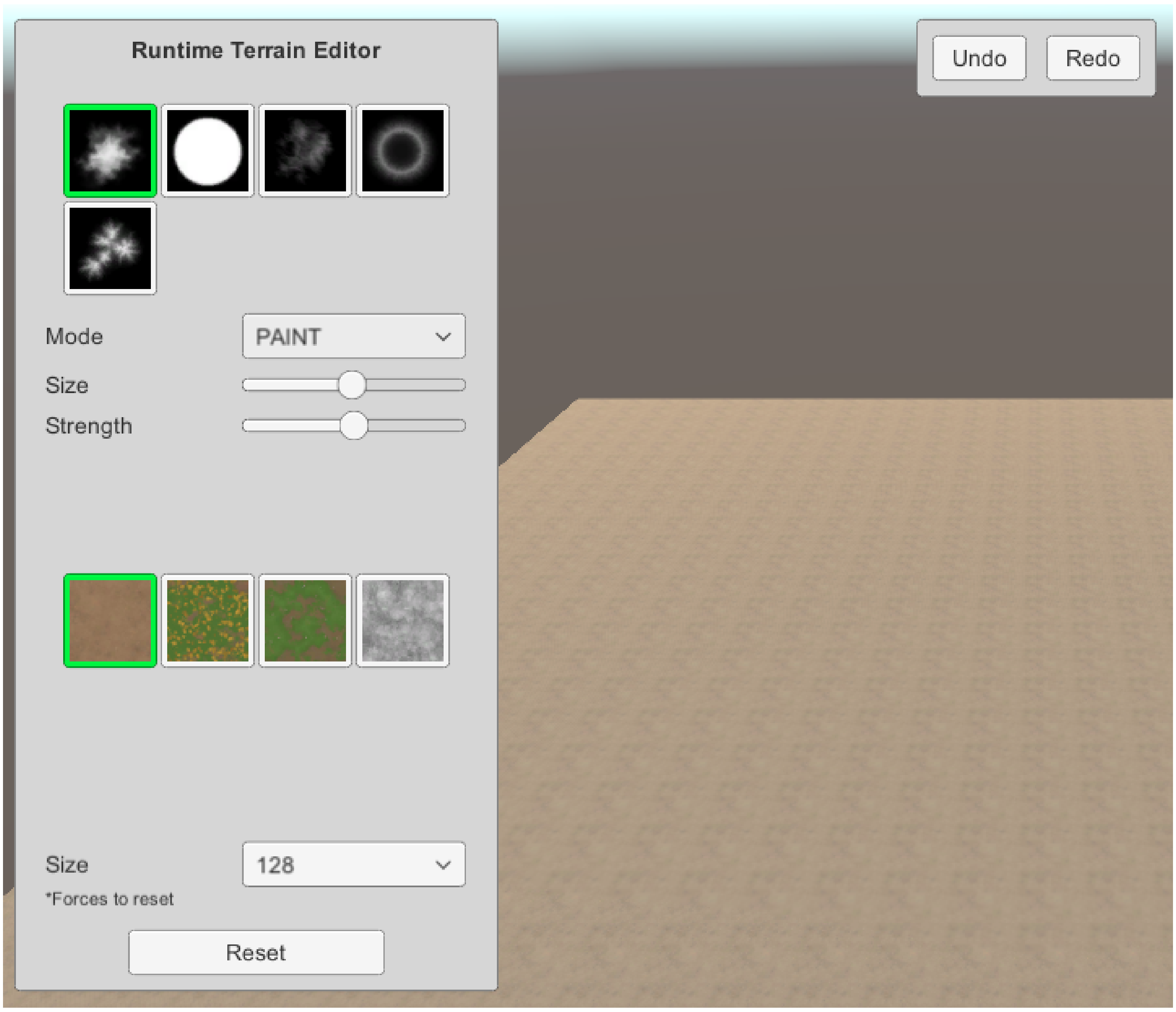
CameraRig

The parent object for main camera. `CameraController` use it for handling rotation.

ViewController

Populates the `ToolView` by settings and default values. Listens ui events and modifies the `RuntimeTerrain` accordingly.

ToolView



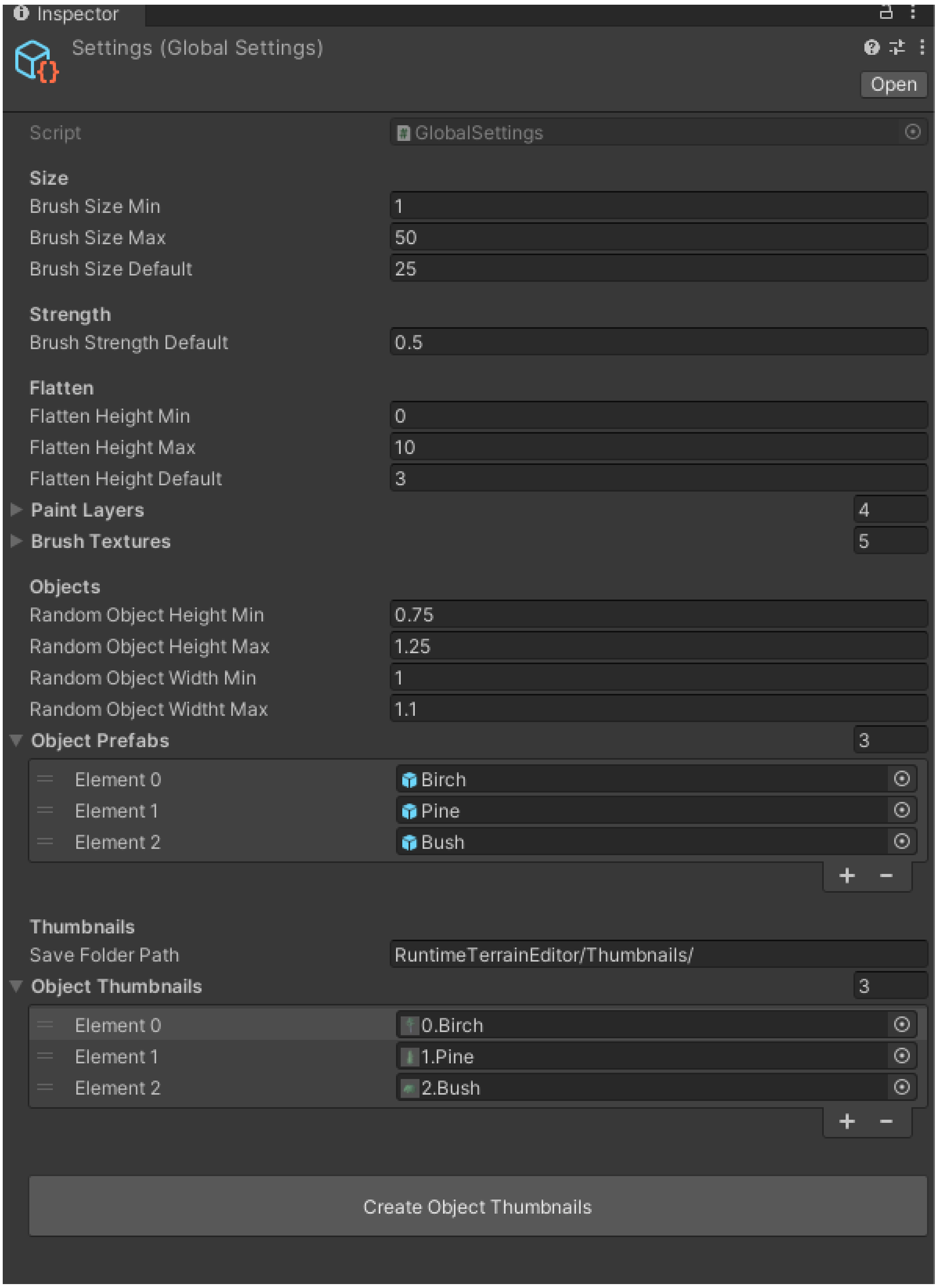
Holds unity ui object references

InputController

Listens for terrain modification related inputs and registers the actions to `CommandHistory`:

- CTRL + Z (Undo)
- CTRL + Y (Redo)
- Left click actions(Hold and release)

Settings


Inspector

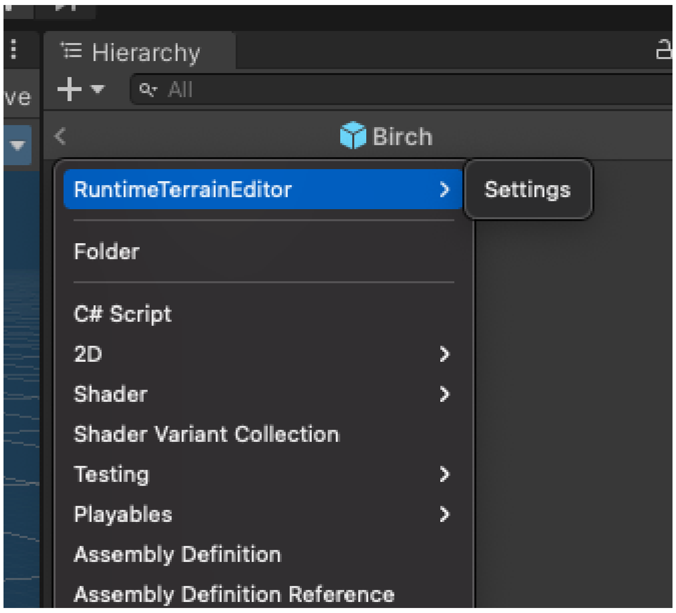
Settings (Global Settings)

Open

Script	GlobalSettings
Size	
Brush Size Min	1
Brush Size Max	50
Brush Size Default	25
Strength	
Brush Strength Default	0.5
Flatten	
Flatten Height Min	0
Flatten Height Max	10
Flatten Height Default	3
Paint Layers	4
Brush Textures	5
Objects	
Random Object Height Min	0.75
Random Object Height Max	1.25
Random Object Width Min	1
Random Object Widtht Max	1.1
Object Prefabs	3
Element 0	Birch
Element 1	Pine
Element 2	Bush
Thumbnails	
Save Folder Path	RuntimeTerrainEditor/Thumbnails/
Object Thumbnails	3
Element 0	0.Birch
Element 1	1.Pine
Element 2	2.Bush

Settings is an asset available as ScriptableObject to provide editing functionality. `ViewController` and `RuntimeTerrain` initializes the settings values.

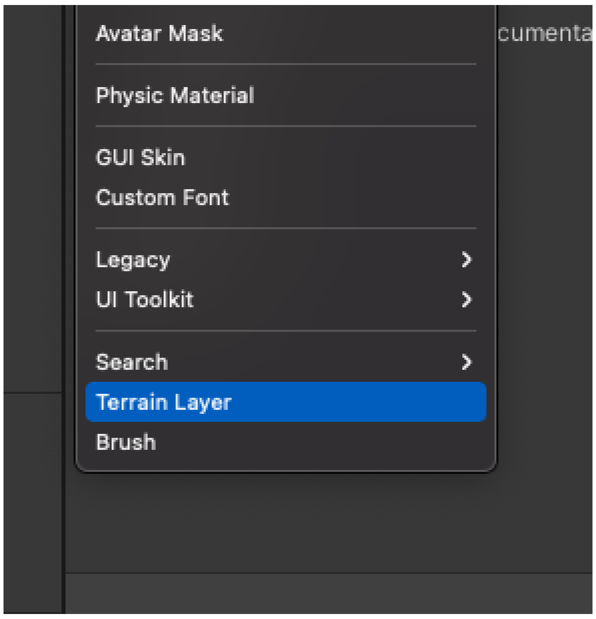
It is also possible to create multiple settings asset in your project. You can create a new settings asset from create menu shown below:

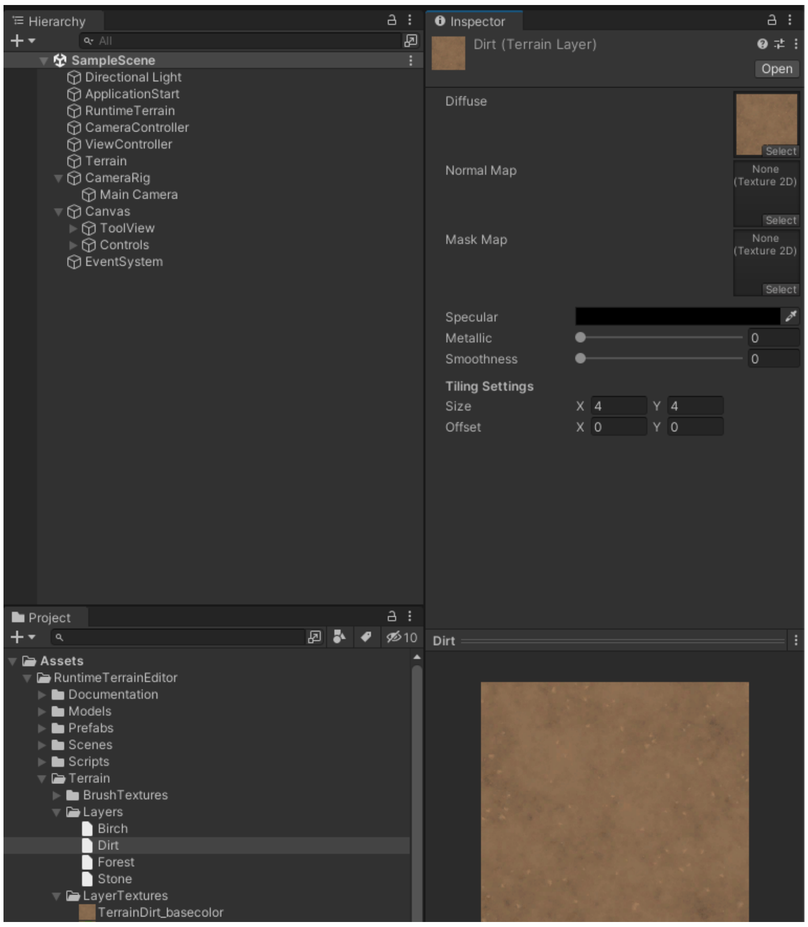


Paint Layers

This project uses standart Unity Terrain Layers for paint. This list will be appear in view by order.

To create a new layer, open Create menu in project panel and click Terrain Layer like shown below:





Diffuse
Normal Map None (Texture 2D)
Mask Map None (Texture 2D)
Specular
Metallic 0
Smoothness 0
Tiling Settings
Size X 4 Y 4
Offset X 0 Y 0

Brush Textures

`RuntimeTerrain` will read grayscale information from the source texture. This list will be appear in view by order.

Any texture resolution could be used since active brush texture will be scaled down or up by current brush size.

Object Prefabs

This project uses TreePrototype to register prefabs to Terrain and TreeInstance to place on terrain.

You can add your custom prefabs to use in editor.

Note that Unity Terrain requires LOD setup to place any GameObject. This prefabs will appear in `ToolView` in order of this list.

Object Thumbnails

Thumbnail textures will be used by prefab index. If no index found, it will appear white color.

To create thumbnails, you can use `Create Object Thumbnails` button. Generated textures will be saved to path provided at settings(`Save Folder Path` field), afterwards they'll be initialized to this list.

Using the API

`RuntimeTerrain` uses the `Terrain` and `TerrainData` to modify the target terrain. It exposes fields and methods to control from outside.

Read-Only Properties

returns	property
`BrushEffectMode`	`BrushEffectMode`
`int`	`BrushSize`
`int`	`BrushIndex`
`float`	`FlattenHeight`
`int`	`PaintLayerIndex`
`int`	`ObjectIndex`

Medhods

`void Init()`
Initializes the setting values into terrain.

`void UseBrush()`
Starts to modify by current `BrushEffectMode`.

`void SetBrushSize(int value)`
Shouldn't bigger than actual terrain size.

`void SetBrushStrength(float value)`
`value` should be between `0.0f` and `1.0f`

`void SetFlattenHeight(float value)`

`void SetBrushIndex(int index)`
Set active brush texture by `index` from `Settings.brushTextures`

`void SetPaintLayerIndex(int index)`
Set active paint layer by `index` from `Settings.paintLayers`

`void SetObjectIndex(int index)`
Set object prototype by `index` from `Settings.objectPrefabs`

`void SetObjectDensity(float density)`

`void SetMode(BrushEffectMode mode)`

`void SetTerrainSize(int size)`
Use `TerrainSize` enumeration values to get best result.

Sets the values following:

- TerrainData.heightmapResolution
- TerrainData.alphamapResolution
- TerrainData.baseMapResolution
- TerrainData.size

Calls `Reset()` internally

`void Reset()`
Clears the objects, heights and paint splats with default values.
Also clears `CommandHistory`.