User Documentation

Terragen is a C# script created during a bachelor's project by a group of students at the University of Applied Sciences FH Joanneum. The script's purpose is to allow quick and easy generation of terrain in unity based on heightmaps. Additionally it allows the application of a custom texture and material to the terrain as well as populating the terrain with objects designated by the user. This document will provide instructions on how to use utilize Terragen's functions.

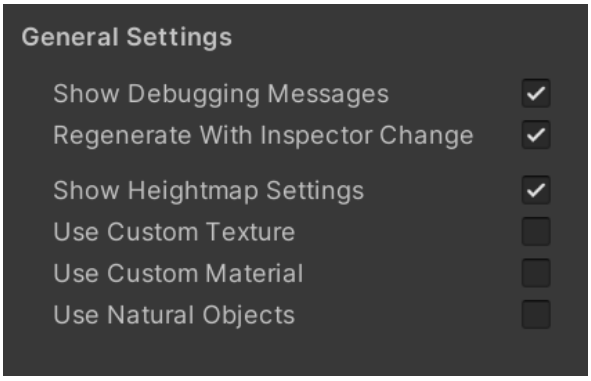
Terragen was originally developed for unity version 2021.3.24f1

1. Installation

To use Terragen in a Unity project retrieve the *Generator.cs* file from https://github.com/rickstick-code/Terragen and add it to the project. Next create an empty object in the scene and add the script to it as a component.

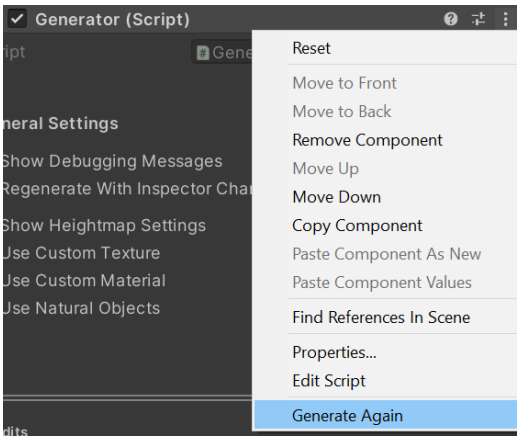
2. General Settings

When attached to an object the General Settings will be displayed at the very top of the script. These settings are used to select which features they require.



Show Debug Messages: Debug messages will be displayed un the Unity console if this option is selected.

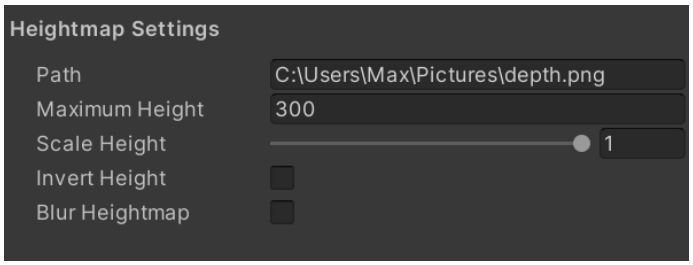
Regenerate With Inspector Changes: This option decides whether changes made in the generator's settings should be executed only when in play mode or at all times. Even when this option is not selected it is still possible to update the terrain without entering play mode by clicking on the three dots next to the script's name and selecting *Generate Again*.



The bottom four options serve to make additional settings visible.

3. Heightmap Settings

The heightmap settings are used for providing the generator with the heightmap that the generated terrain should be based on. Additional options allow the terrain to be slightly tweaked to better match the users' requirements.



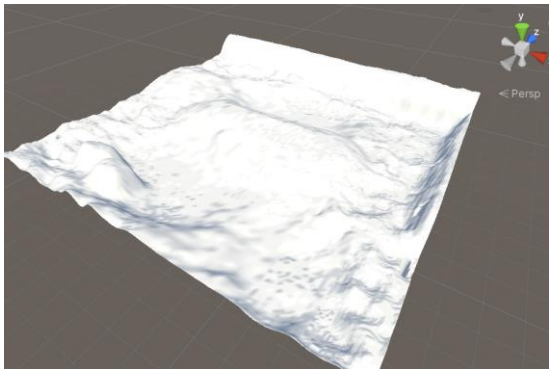
Path: This field requires the file-path of the heightmap.

Maximum Height: Is the maximum height that of the generated terrain.

Scale Height: Lowering this value leads to less significant height differences in the terrain.

Invert Height: The heightmap is inverted and low- and highpoints are swapped.

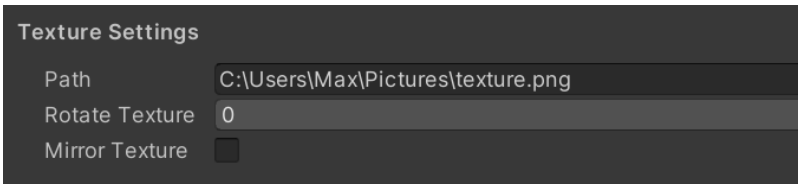
Blur Heightmap: Applies a filter to the heightmap which can lead to smoother elevation changes.



Terrain based on heightmap.

4. Texture Settings

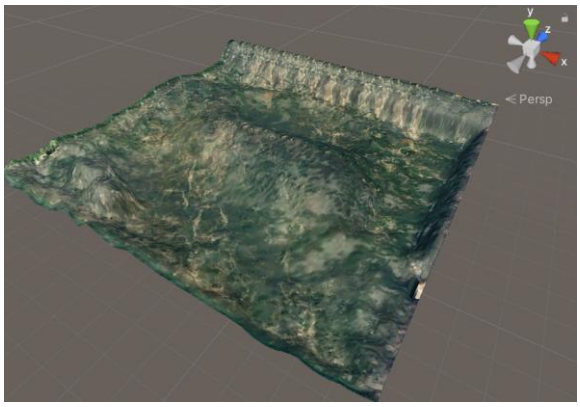
The texture settings are used to apply a texture to the generated terrain.



Path: This field requires a file-path leading to the image that should be used as a texture.

Rotate Texture: An option for changing the texture's rotation for the event that it does not match the heightmap's.

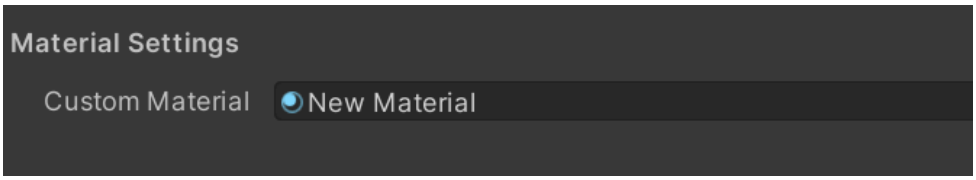
Mirror Texture: An option for mirroring the texture should it be necessary.

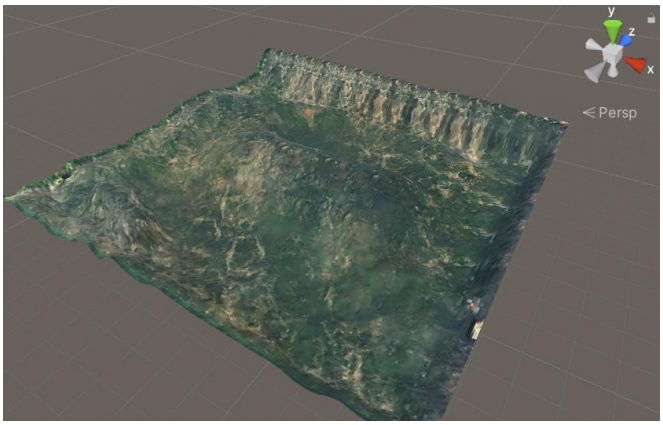


The previous terrain with a matching satellite image added as a texture.

5. Material Settings

The Material Settings are used to apply a Unity material to the terrain.





The same terrain from before, now with a material which makes it appear smoother.

6. Natural Object Settings

These settings allow the user to populate the generated terrain with objects, e. g. trees.

The two options for populating the terrain are prefabs or textures. Each object is assigned a **mapped colour**. The **Path For Map** field needs to be filled with a file-path leading to an image. Parts of the map where an objects mapped colour matches the colour of the map are populated with that object. To ensure the mapped colours match the colours on the map use of the eyedropper tool is recommended.

Increasing the **colour tolerance** will make objects appear even when the mapped colour doesn't exactly match the colour on the map.

The **Object Density** slider is used to set how many objects should be generated in total. A lower number is recommended for weaker hardware.

The map used for mapping the objects can be the same image that is used as a texture.