

Progress Report

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A Procedural, Minimal Input, Natural Terrain Plug-in for Blender

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1 Previous Objectives

Create a river generator with a radius of influence and then create the terrain based of that.

2 Progress

2.1 River paths

A simple river path was procedurally created, and then radius of influence calculations done using the distance formula to give a heightmap varying between 0.0 and 1.1, where zero would indicate a river bed and one the full extent of normal terrain generation methods (currently Fractional Brownian Motion). This heightmap is visible in Figure 1. Interpolating by generating the rest of the terrain gives Figure 2 with 2(a) having a radius of influence of ten units, and 2(b) having a radius of influence of 20 units. Using the erosion method and putting the two different width rivers through 1000 steps of erosion renders images as shown in Figure 3 [2, 1]. Although the ten radius image does not look entirely convincing before erosion, it does tend toward realism afterward.

2.2 Blender scene

The script was updated to create 1600x1200 renders by default, with a black background. The shader on the terrain mesh was also changed to permanently be the Oren-Nayer shader as this seems to generate better quality renders.

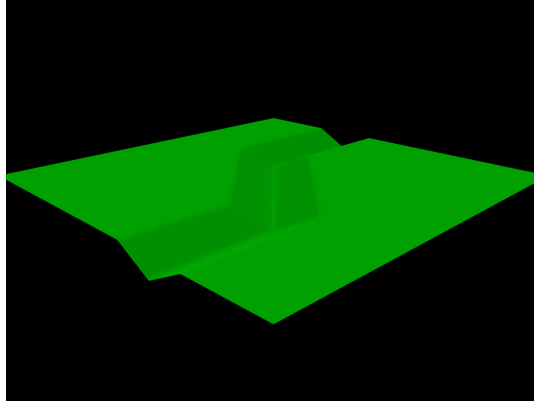
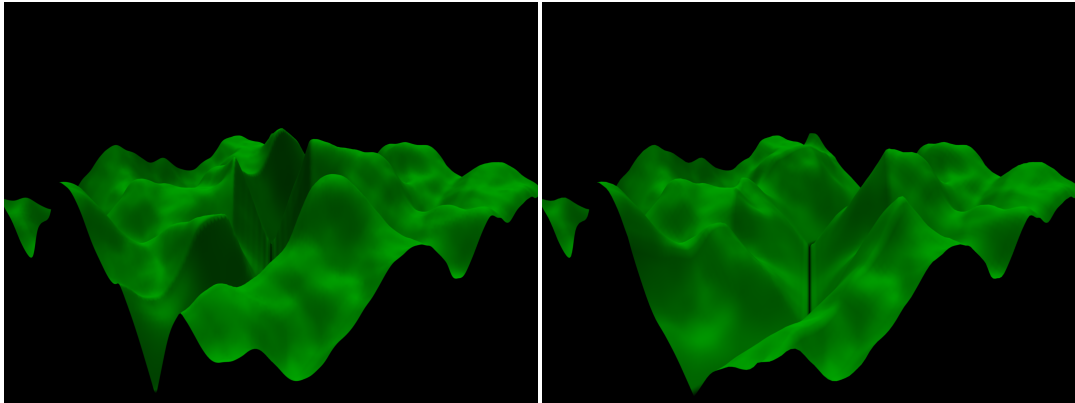


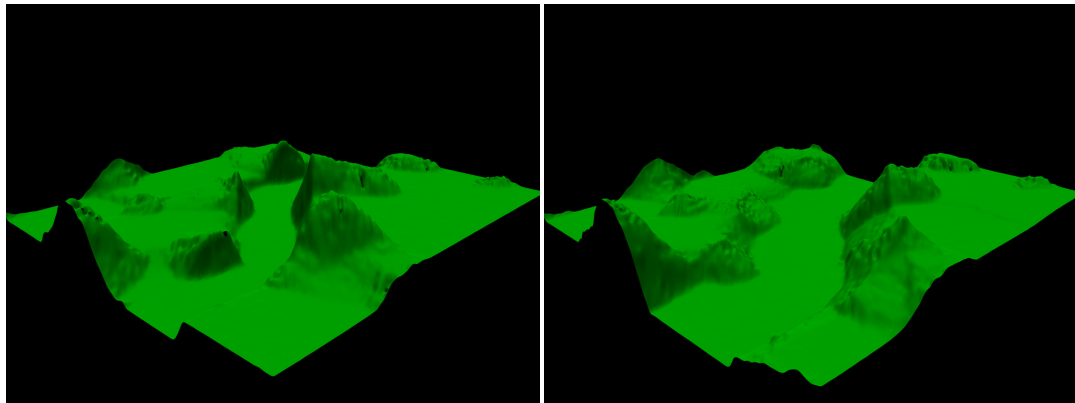
Figure 1: River path and radius of influence



(a) 10 radius

(b) 20 radius

Figure 2: Terrains with river paths



(a) 10 radius

(b) 20 radius

Figure 3: Eroded terrains with river paths

3 Problems

None

4 Objectives for Next Week

- Do a comprehensive visual analysis of all the factors influencing the Fractional Brownian Motion generator with the intention of being able to control not only the maximum height at a position, but create smoothly varying river banks too for instance.
- Experiment with creating Squig curves to generate the river paths [3].

References

- [1] Bedrich Benes and Rafael Forsbach. Visual simulation of hydraulic erosion. In *WSCG 2002 Conference*, 2002.
- [2] F. K. Musgrave, C. E. Kolb, and R. S. Mace. The synthesis and rendering of eroded fractal terrains. In *Proceedings of the 16th annual conference on Computer graphics and interactive techniques*, pages 41–50. ACM Press, 1989.
- [3] Przemyslaw Prusinkiewicz and Mark Hammel. A fractal model of mountains with rivers. In *Proceeding of Graphics Interface '93*, pages 174–180, Toronto, Ontario, May 1993.