Procedural Generation Using Noise

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DRAFT 1

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Abstract

Procedural Content Generation is a method of creating data algorithmically, often using stochastic models. These methods can be used to generate complex environments as opposed to manually creating environments by hand or by using photogrammetric techniques. Procedural generation can use a variety of techniques to achieve a stochastic or partially stochastic goal, including methods such as fractals, noise, deep learning as examples.

Contents

1 Introduction

This paper surveys various methods of procedural generation and their applications in generating geological formations.

1.1 Overview

2 Height Maps

Talk about usage of heightmaps, weaknesses
some weakness include - only 2 dimensional geological formations, so archways and caves are not possible
might be mitigatable by layering multiple different height maps, but increases computation time
example of practical application in rendering or pre generating voxel space heightmaps

3 Polygons

3.1 Rendering Differences

Constructing polygons from height maps, similar problem

3.2

4 Voxels

Voxels can be used in a lot of ways to render maps
Talk about minecraft's storage of voxel terrain data
Contrast with vooxel rendering techniques

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5.1 Areas of Research

Possible areas of research?
There is deep learning for procedural generation, but it appears to not be

very sophisticated - I cant tell any differences between the deep learning application of noise and just normal perlin noise

5.2   Algorithm Advancements

Talk about areas that have been advanced; i.e perlin noise vs simplex noise

6   Summary

7   Appendix

8   References

LaTeX [1] is a set of macros built atop TeX [1].

References

[1] N. Mikuličić and Ž. Mihajlović. Procedural generation of mediterranean environments. In *2016 39th International Convention on Information and Communication Technology, Electronics and Microelectronics (MIPRO)*, pages 261–266, 2016.