

Graphics Assignment 1

Terrain height field generation

1 What?

Write a program that generates a terrain height field that uses the *Mid Point Displacement* algorithm and displays the results on screen.

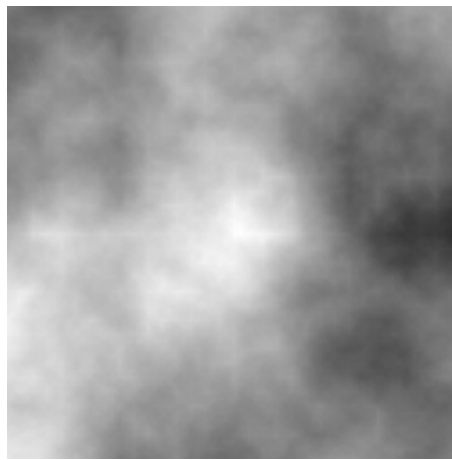


Figure 1: Example of a heightfield using mid point displacement

2 How?

A *height field* is a 2D bitmap that is used to store elevation data: the (x, y) position of a point in a height field corresponds to its real world (x, y) position, and the value at a point in a height field corresponds to its height.

The Mid Point Displacement algorithm (also known as the Plasma algorithm) is a simple recursive algorithm that can be used to generate reasonably realistic terrain data. The algorithm generates square terrains with dimensions $2^n + 1$ by $2^n + 1$. For this assignment you should generate a 257×257 height field. You can find a description of the Mid Point Displacement algorithm at:

<http://www.lighthouse3d.com/opengl/terrain/index.php3?mpd>