

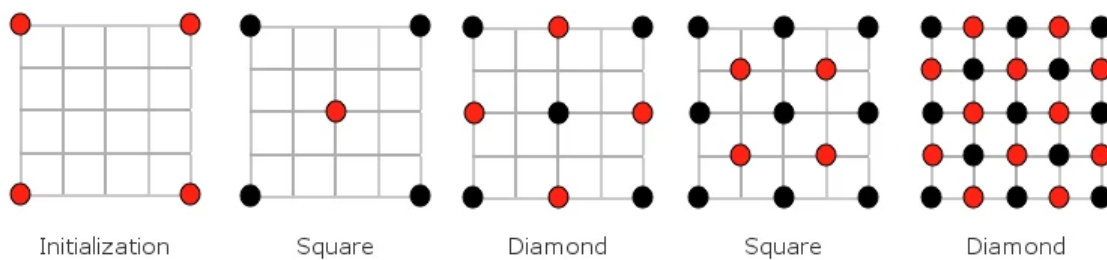
Ben Hudson

Portfolio

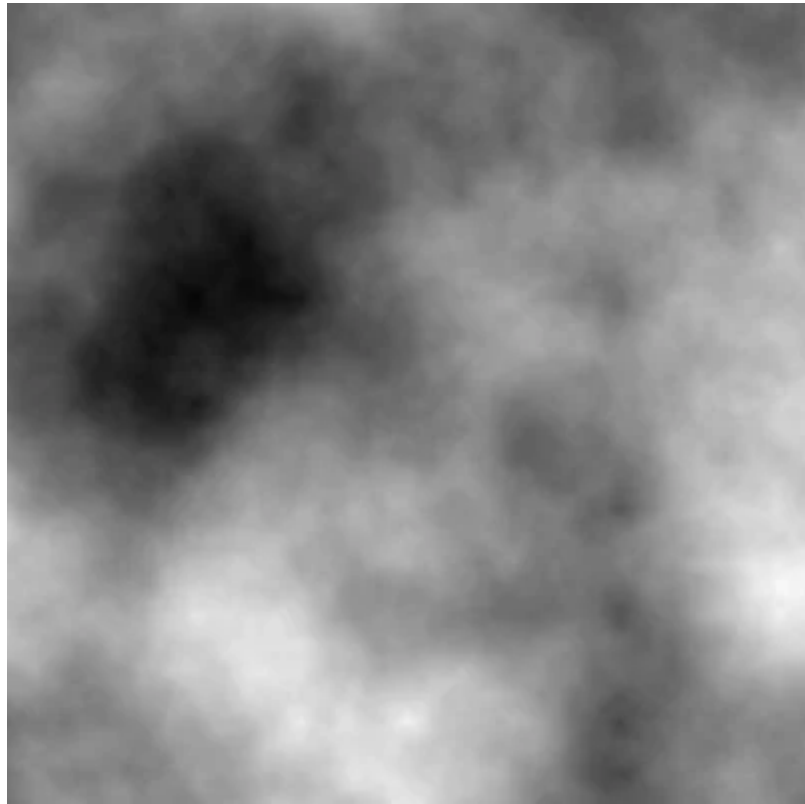


The diamond-square algorithm is a fractal algorithm used in computer graphics to generate random heightmaps.

Starting with a square grid, the four corners are initialized to a random height. Then, the “diamond” and “square” steps are performed alternately until all points in the grid have been set. In the “square” step the four corners of the grid (or sub-grid) are averaged and some random noise is added. The result is assigned to the point in the center of the grid. The diamond step is the same, except the corners form diamond, not a square:



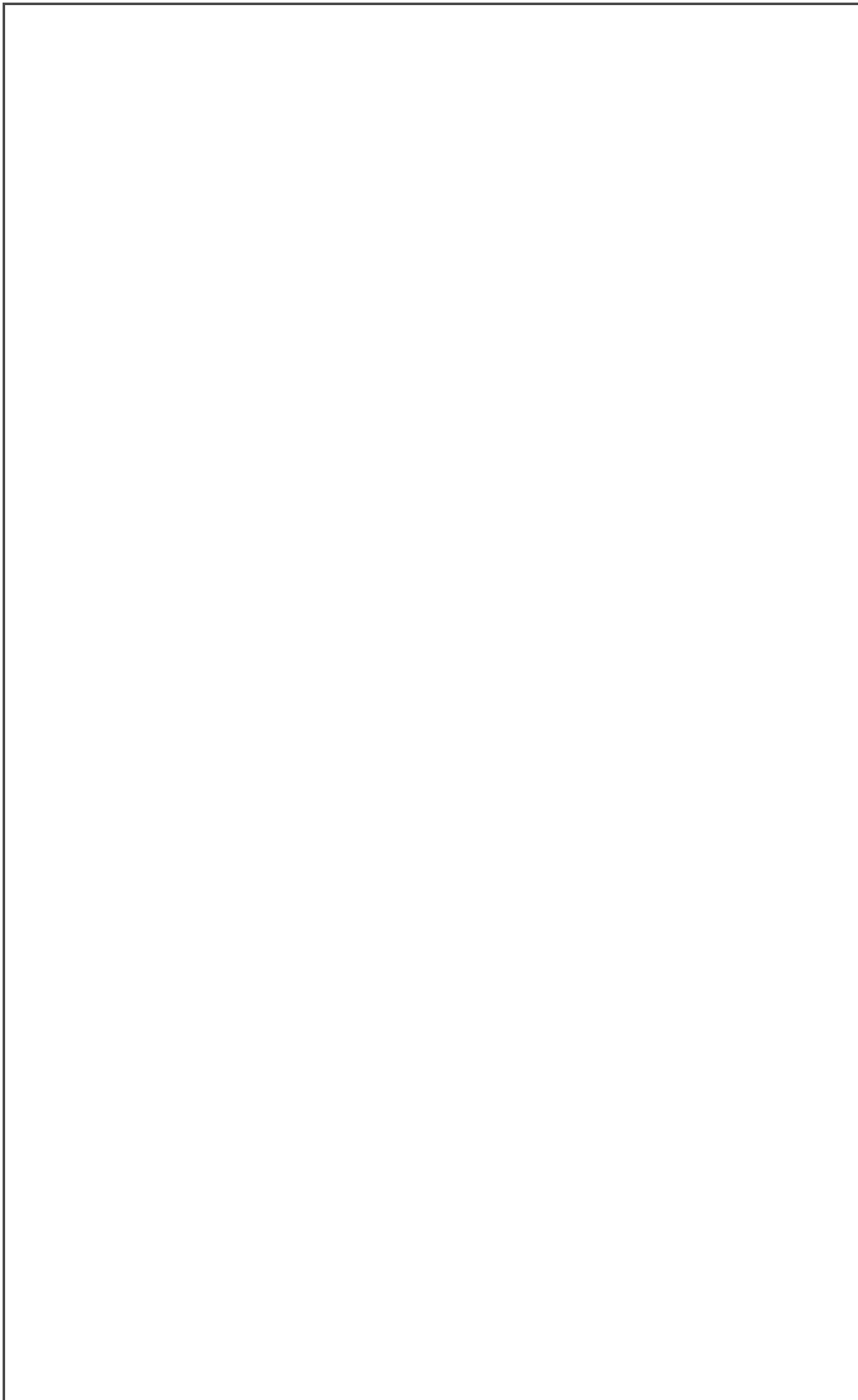
Up Next: Purrrbble



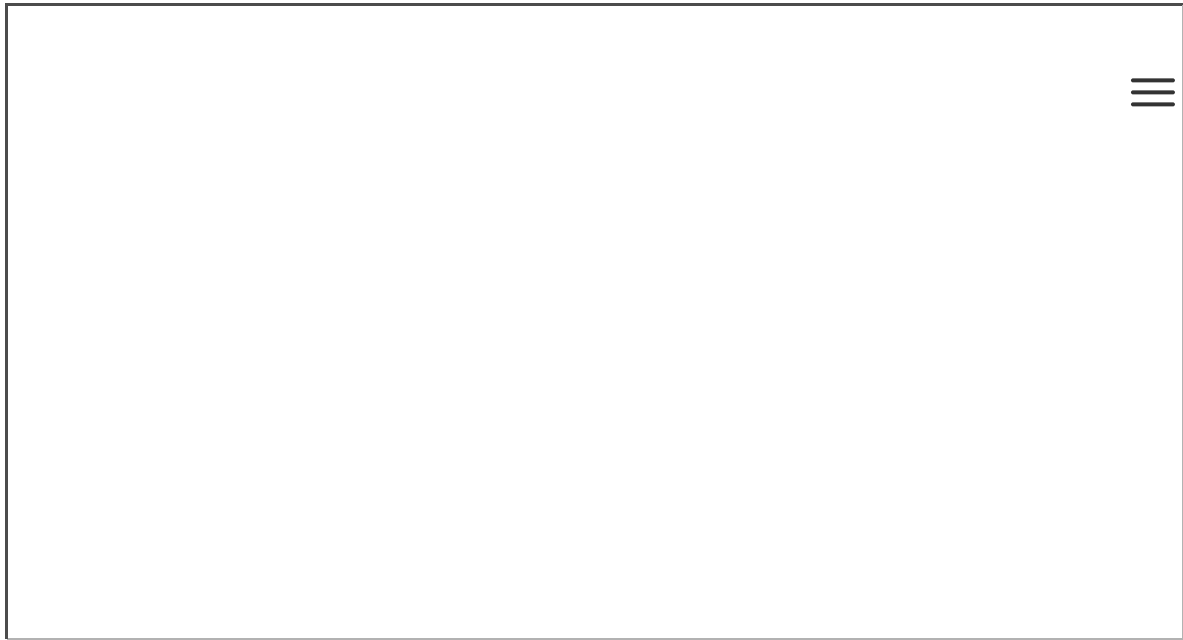
The darkest parts correspond to the the lowest points and the brightest parts are the highest.

2D is nice, but 3D is better

OpenGL makes it easy to turn a heightmap into a 3D surface. In the example below, the size of the grid has been reduced (65x65 compared to 513x513 in the 2D example) so the squares are visible in the wireframe. Increasing the size of the grid smooths sharp edges. Once lighting and a “sea” are added, it looks just like a real landscape!



Increasing the resolution renders a very realistic landscape:



Randomly generated landscapes using a fractal algorithm.

URL github.com/ben-hudson/fractal-landscapes

Tools C, OpenGL

Up Next: Purrrbble



Up Next: Purrrbble