Landscape Generation Using Perlin Noise

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Breakdown

A. Perlin Noise

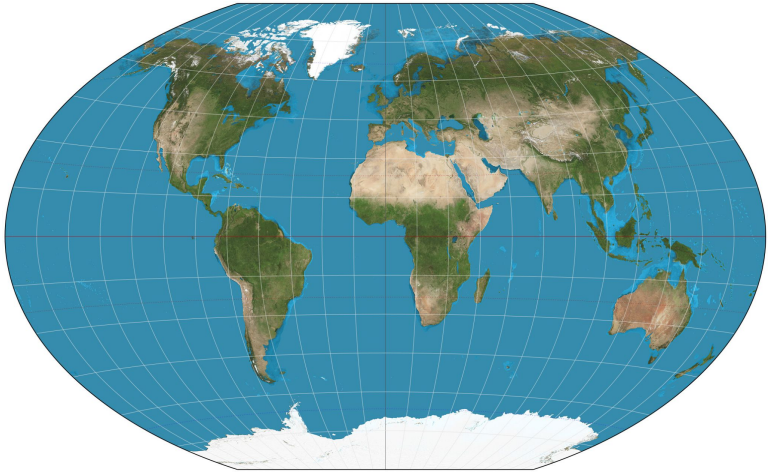
B. Inside-Outside

C. Parameters

D. Applications

E. Future Ideas

Our Landscape Comes from Noise!



Geography ❤️ Perlin noise

- Geography = Fluctuations
- Fluctuations = Perlin noise

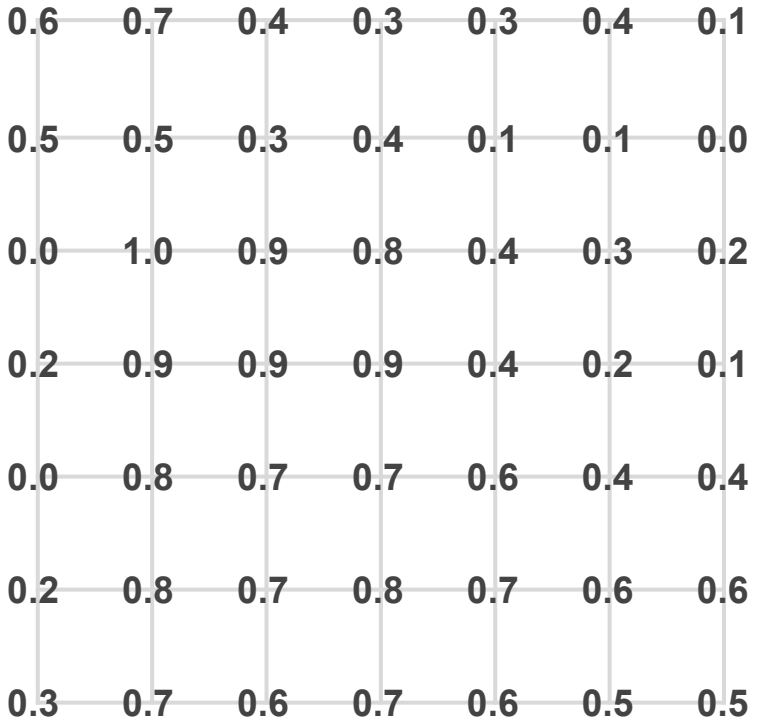
Landscape in a Grid??

Tile maps can look choppy

- ~~Tile = water/land~~
- Vertex = water/land
- 2 sprites vs 2^4 sprites

Translate Perlin Noise to Vertices

Each vertex gets
a float value [0, 1]

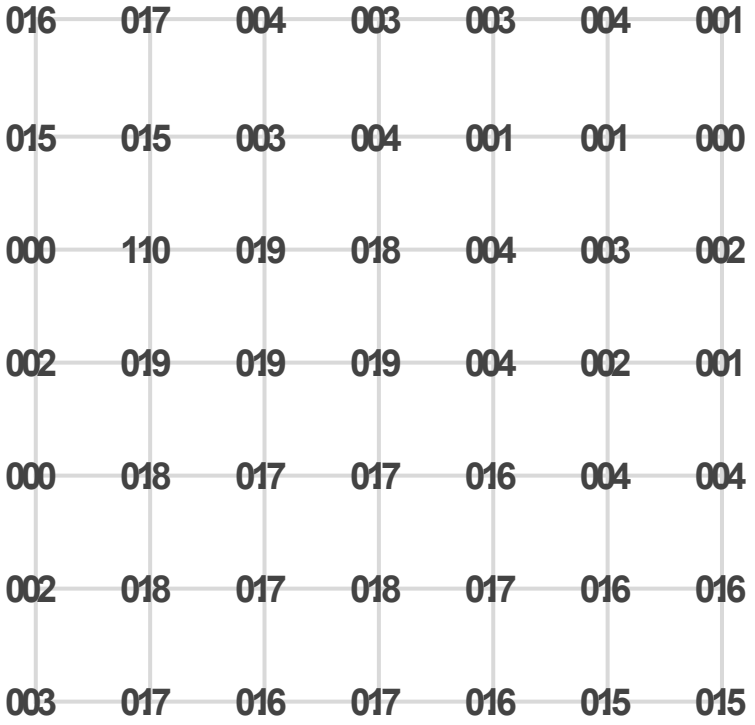


Translate Perlin Noise to Vertices

Set a threshold value:

If vertex ≤ threshold: water (0)

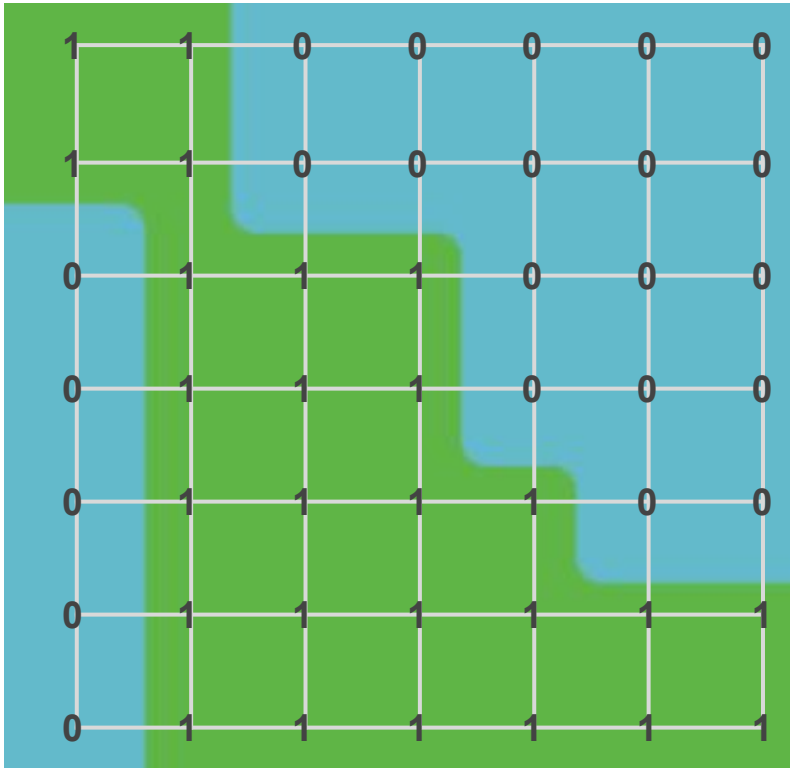
If vertex > threshold: land (1)



Translate Perlin Noise to Vertices

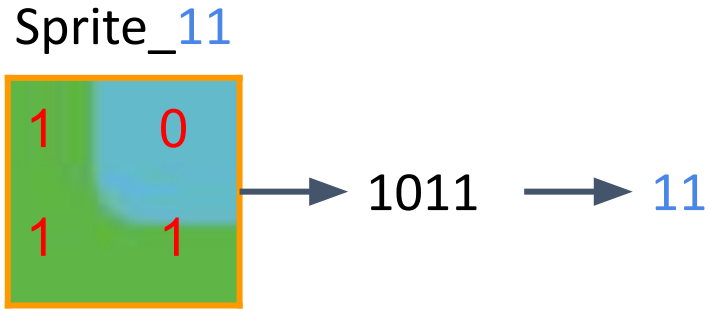
Each tile looks at its four corners

Loads the right sprite



A Clever Trick

- Q: How do we map a tiles vertices to a sprite?
- A: Convert vertex values to a suffix



Adjustable Parameters

Seed

- Predictable randomness

Noise Period

- Size of landscape features

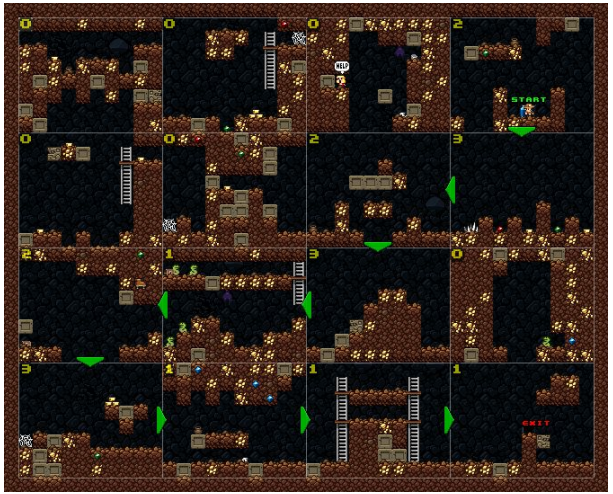
Sea Level

- Amount of water in the landscape

The Applications are Endless

Level Generation

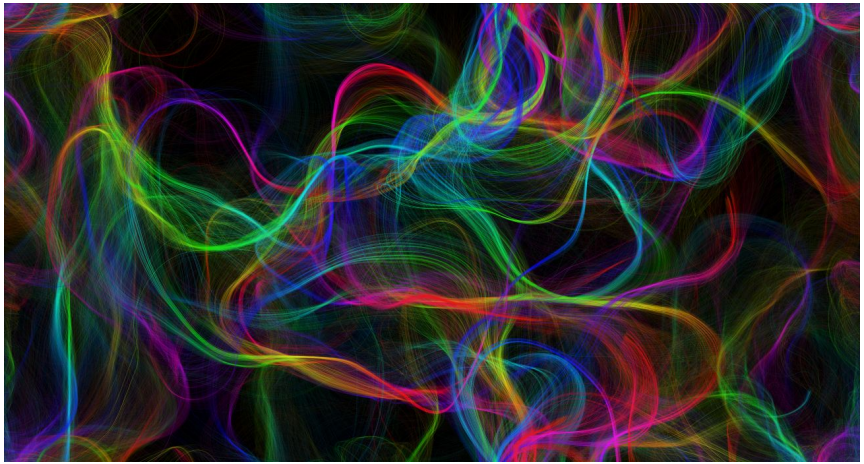
Spelunkey

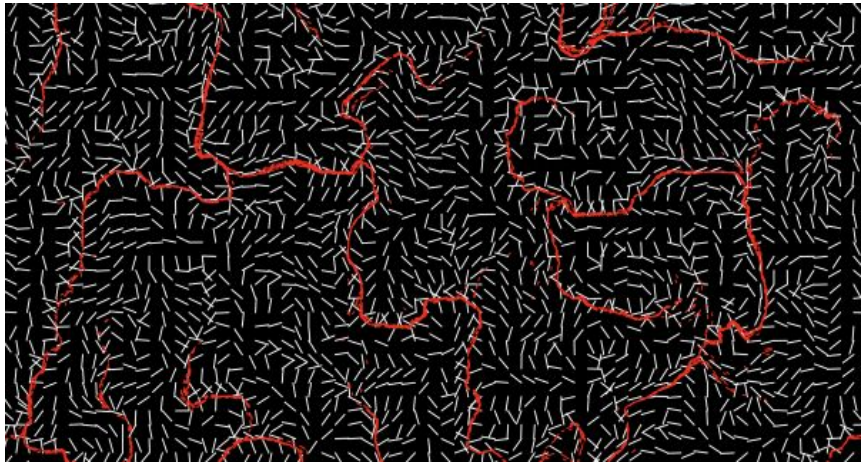


Spore

The Applications are Endless

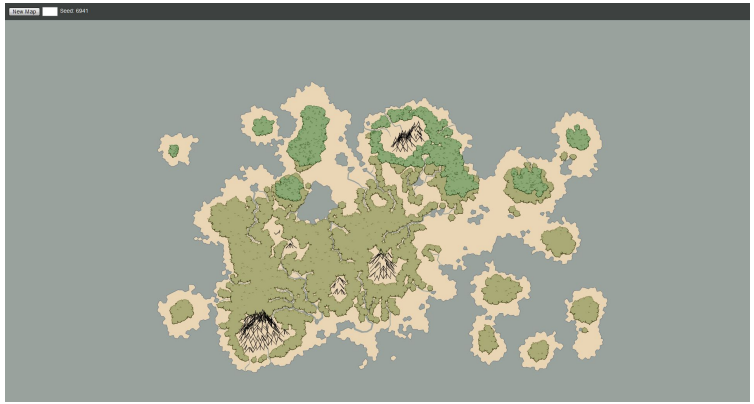
Art





The Applications are Endless

Geographical
Simulations



What Does the Future Hold?

- Add more vertex types
- 3D
- Add more parameters
- Live editing

Demo Time!

Thank You!