

Rendering Photorealistic Mountain Terrain

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Agenda

- ▶ Overview
- ▶ Background & Motivation
- ▶ Height-map Generation
- ▶ Rendering Techniques
- ▶ Technology
- ▶ Challenges
- ▶ Conclusion
- ▶ Future Work
- ▶ Demo
- ▶ Questions

Overview

- ▶ Height map generation
- ▶ Tessellation
- ▶ Calculating Normals
- ▶ Lighting
- ▶ Texturing
- ▶ Skybox
- ▶ Camera Controls
- ▶ Performance Statistics

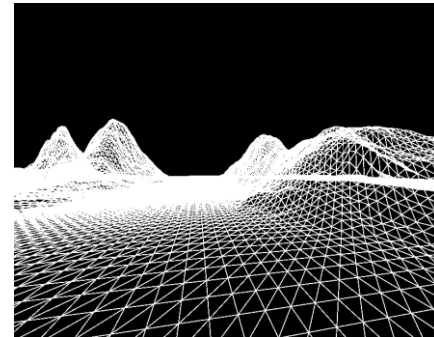
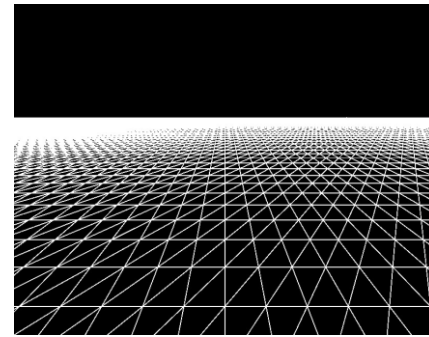
Background

- ▶ Diamond Square Recursive Subdivision
- ▶ Applications

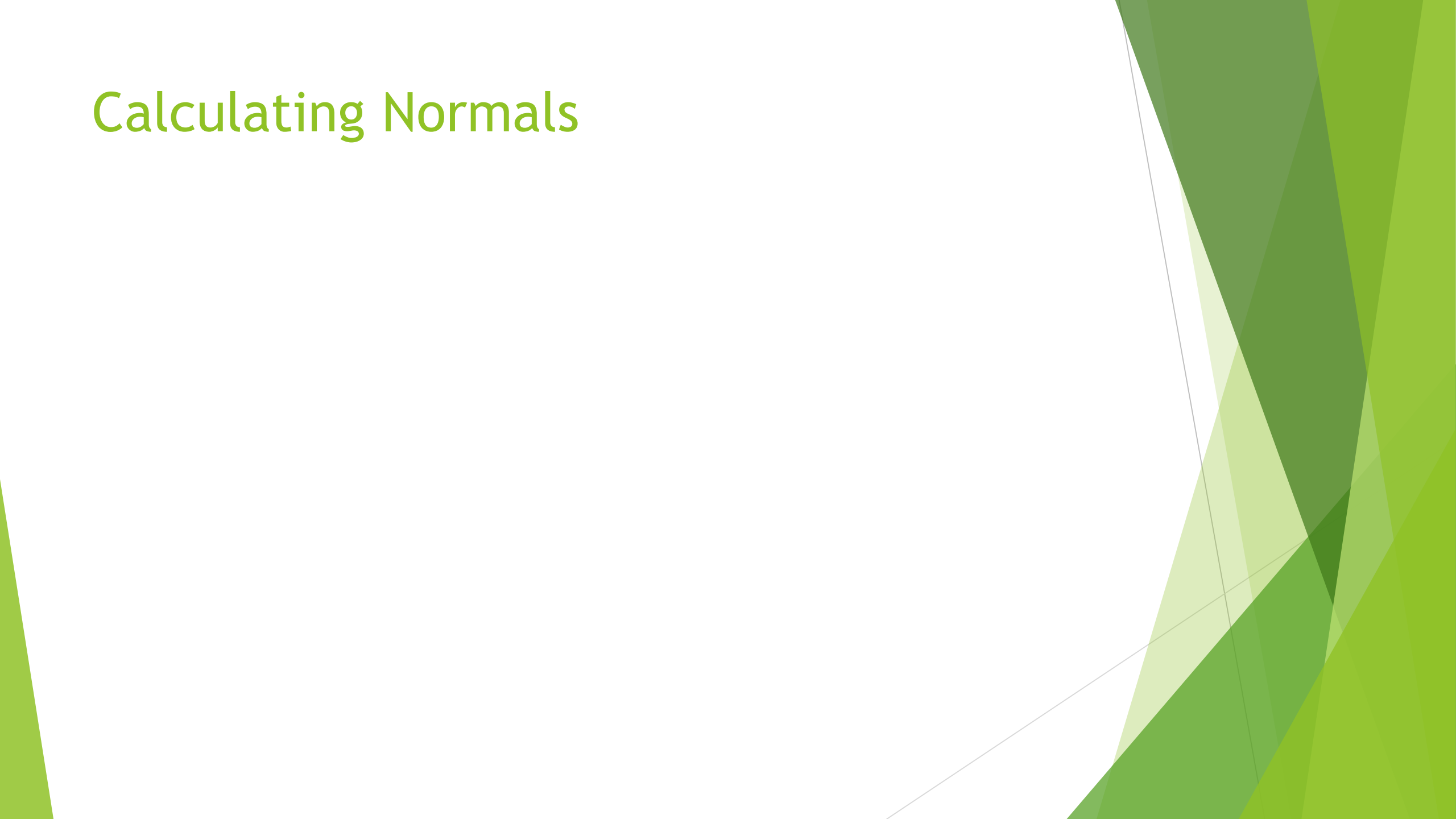
Height-map Generation

- ▶ Perlin Noise

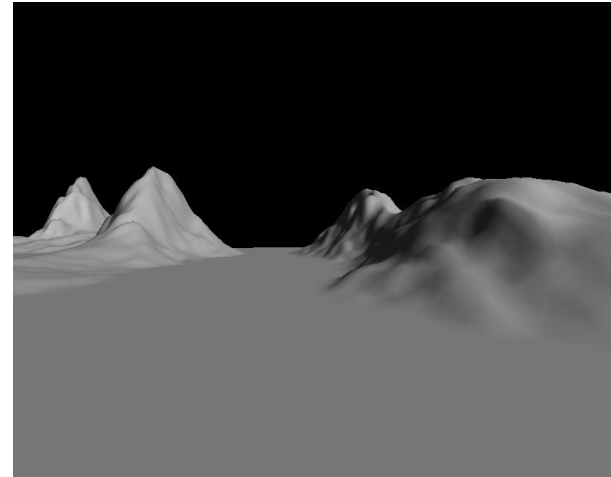
Tessellation



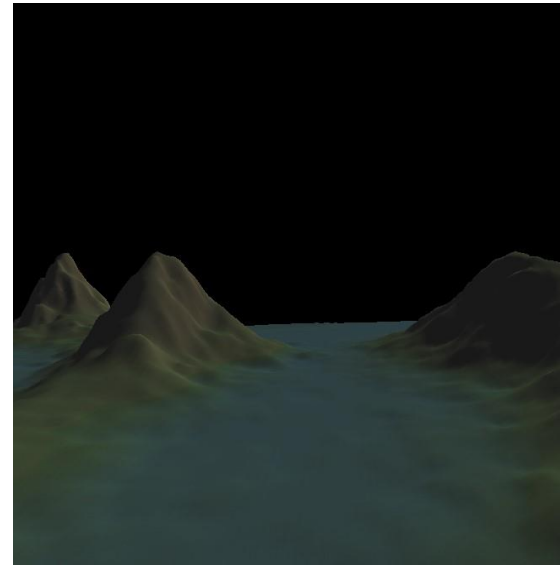
Calculating Normals



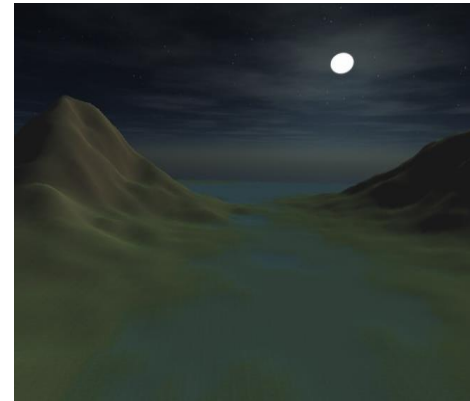
Lighting



Texturing



Skybox

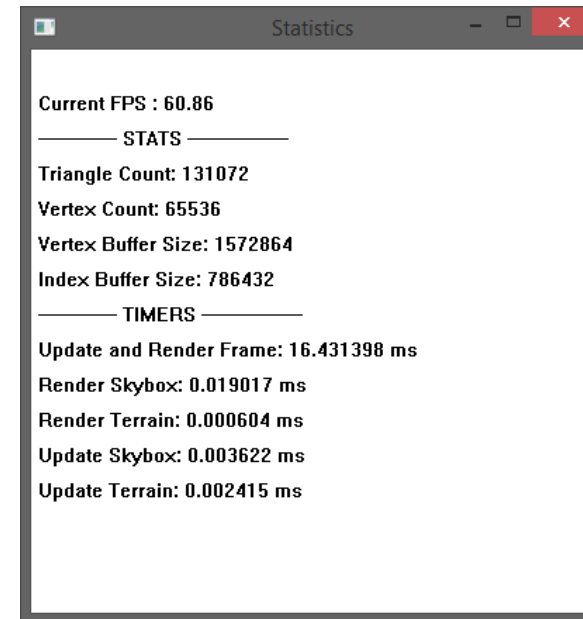


Camera Controls



Performance Statistics

► FPS



Technology

- ▶ C++
- ▶ Windows 8.1 SDK
- ▶ DirectX 11 SDK
- ▶ DirecXTK
- ▶ Visual Studio 2013
- ▶ Github / GitExtensions

Challenges

- ▶ Sharp Transitions
- ▶ Texture Stretching
- ▶ Sea Level Transisiton
- ▶ Clipping
- ▶ Skybox Edges

Conclusion

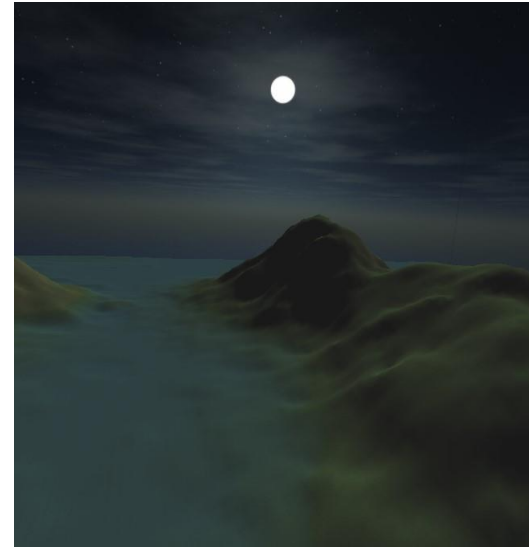
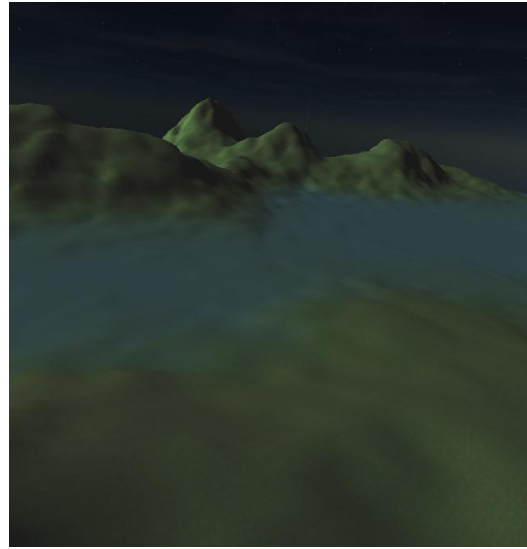


Future Enhancements

- ▶ Shadow Mapping
- ▶ Tessellation Shader
- ▶ Terrain Editor
- ▶ Ocean Shader
- ▶ User Interface
- ▶ Segway to Game Engine

Demo

- ▶ 'w' - Move camera forward
- ▶ 's' - Move camera back
- ▶ 'a' - Yaw camera left
- ▶ 'd' - Yaw camera right
- ▶ 'e' - Pitch camera up
- ▶ 'c' - Pitch camera down
- ▶ 'k' - Screen shot
- ▶ 'l' - Toggle Lighting
- ▶ 'm' - Toggle wire-mesh
- ▶ 't' - Toggle texturing
- ▶ '1' - Toggle terrain
- ▶ '2' - Toggle skybox



THANK YOU !

