

Leopold-Franzens-Universität Innsbruck

Institute of Computer Science Interactive Graphics and Simulation Group

Bachelor Thesis

Procedural Generation of Mountain Ranges Based on Geology

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advised by Univ.-Prof. Dipl.-Inf. Matthias Harders

Abstract

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Keywords keyword1, keyword2.

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Introduction

1.1 Section One

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1.2 Section Two

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Related Work

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Methods

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Results

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Conclusion & Future Work

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Bibliography

- [1] Alain Fournier, Don Fussell, and Loren Carpenter. Computer Rendering of Stochastic Models. *Commun. ACM*, 25(6):371–384, June 1982.
- [2] K. Raiyan Kamal and Yusuf Sarwar Uddin. Parametrically Controlled Terrain Generation. In *Proceedings of the 5th International Conference on Computer Graphics and Interactive Techniques in Australia and Southeast Asia*, GRAPHITE '07, pages 17–23, New York, NY, USA, 2007. ACM.
- [3] Robert Krten. Generating Realistic Terrain. Dr. Dobb's Journal: Software Tools for the Professional Programmer, 1994.
- [4] Xing Mei, Philippe Decaudin, and Bao-Gang Hu. Fast Hydraulic Erosion Simulation and Visualization on GPU. In Marc Alexa, Steven J. Gortler, and Tao Ju, editors, PG '07 15th Pacific Conference on Computer Graphics and Applications, Pacific Graphics 2007, pages 47–56, Maui, United States, October 2007. IEEE.
- [5] Tomas Möller and Ben Trumbore. Fast, minimum storage ray/triangle intersection. In ACM SIGGRAPH 2005 Courses, page 7. ACM, 2005.
- [6] F. K. Musgrave, C. E. Kolb, and R. S. Mace. The Synthesis and Rendering of Eroded Fractal Terrains. In *Proceedings of the 16th Annual Conference on Computer Graphics* and Interactive Techniques, SIGGRAPH '89, pages 41–50, New York, NY, USA, 1989. ACM.
- [7] Jacob Olsen. Realtime Procedural Terrain Generation: Realtime Synthesis of Eroded Fractal Terrain for Use in Computer Games. 2004.
- [8] M. Shimrat. Algorithm 112: Position of Point Relative to Polygon. Commun. ACM, 5(8):434–, August 1962.
- [9] Laurii Vitanen. Physically Based Terrain Generation: Procedural Heightmap Generation Using Plate Tectonics. B.S. Thesis, 2012.
- [10] Mason Woo, Jackie Neider, Tom Davis, and Dave Shreiner. OpenGL Programming Guide: The Official Guide to Learning OpenGL, Version 1.2. Addison-Wesley Longman Publishing Co., Inc., Boston, MA, USA, 3rd edition, 1999.