Terrain Generation Engine using Voxels

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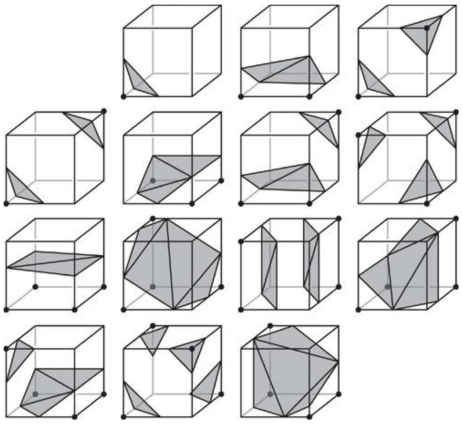
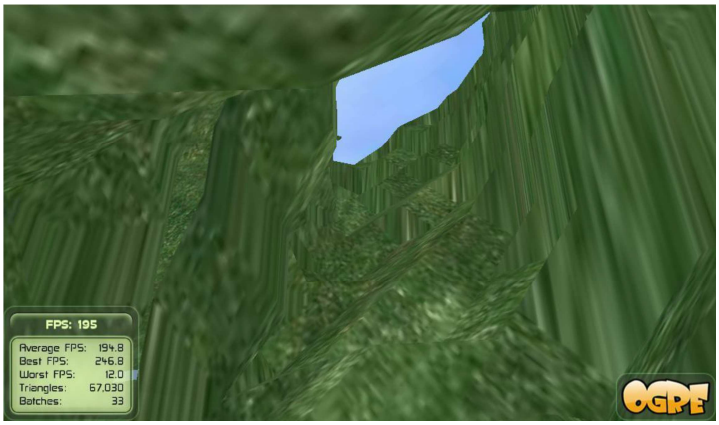
Abstract

Traditional computer terrain generation techniques rely on height maps which suffer from constraints preventing them from generating complex features like caves, overhangs, and arches. With the advent of more computing power, voxels are a viable alternative to create such structures. This project consists of a terrain generation engine written in C++ using the OGRE 3D rendering engine, allowing the user to control the terrain features with a simple Graphical User Interface. The created terrain expands to encompass the position of the camera in real-time, and is generated using voxels, the Marching Cubes algorithm, and multithreading.



14 Marching Cubes configurations



Inside of cave, looking at the sky

Committee Members:
M. Barnes, chair
G. Wang
P.Gabrovsky

Date: May 2, 2013
Time: 11 am
Location: JD 4440