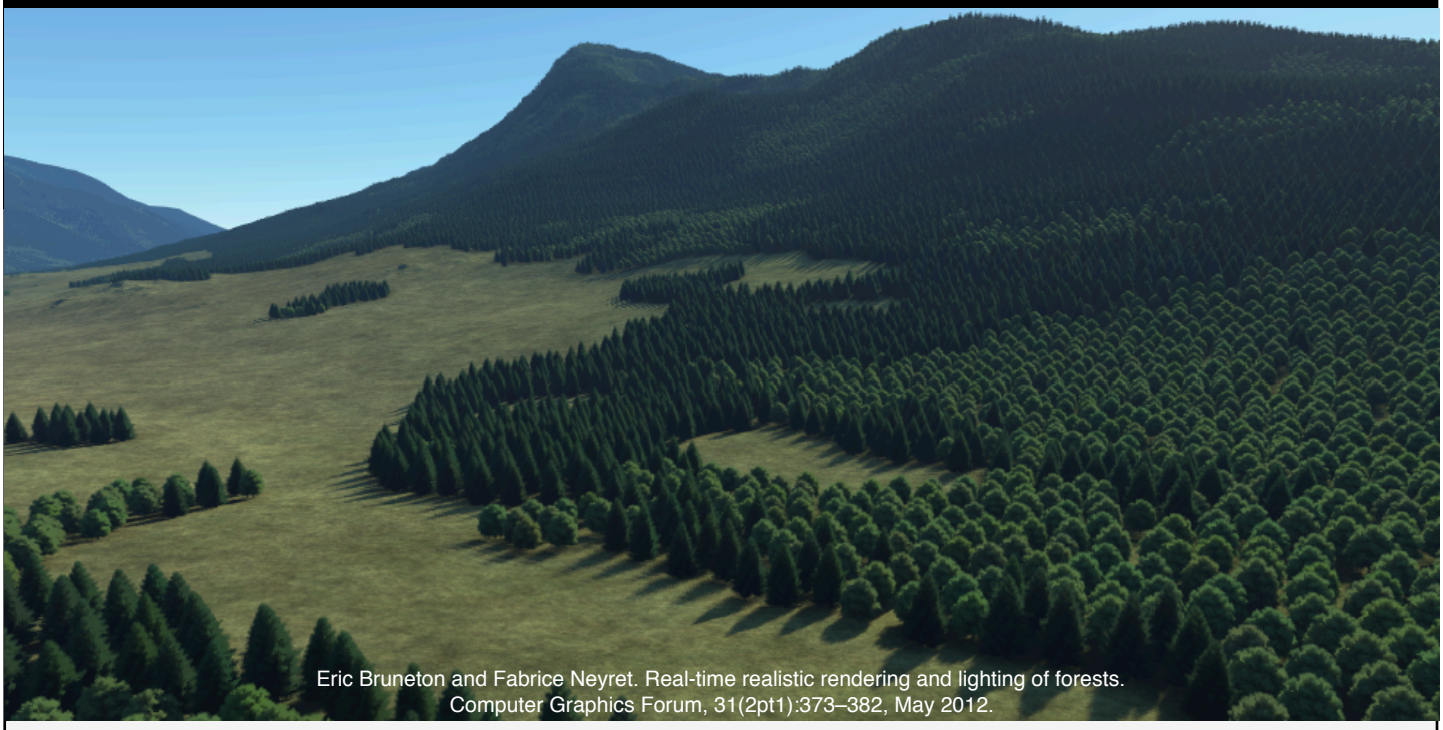
Master Project:
Large Scale Vegetation Rendering

University of Zurich[UZH]



Eric Bruneton and Fabrice Neyret. Real-time realistic rendering and lighting of forests. Computer Graphics Forum, 31(2pt1):373–382, May 2012.

Topic

3D geographic information systems are heavily dependent on GIS feature data. Geographic features are usually drawn in cartographic maps and abstract 2D or 3D representations. 3D graphics offers the possibility to create more realistic or illustrative impressions for such data sets by applying modern rendering algorithms. Large scale forest rendering is a typical example for such a connection between real-time graphics and GIS feature information.

Large scale forest can de created in several ways. One way to solve this challenge is to use large scale billboard fields connected with advanced light algorithms to create the impression of a large scale forest. These methods provide spectacular views with relatively simple computational effort. Another method of rendering forests is the usage of self similar objects, also called fractals to generate vegetation by L-systems.

Forest renderings might also depend on parameters such as rainfalls or types of trees and depending on this information the graphical representations can be adjusted.

Assignment

In this project, the goal is to produce an application to visualize large scale forests given by an input GIS data set. The input data can be texture information of 2D boundary information. The visualization should be able to visualize millions of billboard trees, including advanced lighting, shadows and navigation. The forests should consist of several types of trees, shrubs and also gras landscapes.

The implementation of this vegetation visualization will be integrated into an existing real-time terrain rendering project. The implementation will be done with C++ and OpenGL & Qt.

Requirements

Interest in advanced computer graphic topics. This project has to be done as a group project. If possible, all participants should have experience with OpenGL, optimally you have been before in one of the graphics courses .

Work Load

- 30% theory
- 50% implementation
- 10% testing
- 10% modelling

Student Project Type

This topic can be done as Master Project in a group of 2-3 persons. Goals are adjusted depending on the project type and number of students.

Supervision

Prof. Dr. Renato Pajarola
Alireza Amiraghdam (assistant)

Contact

Write an E-Mail to amiraghdam@ifi.uzh.ch

VISUALIZATION AND MULTIMEDIA LAB

Prof. Dr. Renato Pajarola
Visualization and MultiMedia Lab
Department of Informatics
University of Zürich