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Grass Rendering

Project Proposal

1.What

The goal of our project is to realize a realistic real-time grass rendering simulation in OpenGl. The user should be able to move his camera in this field without breaking the illusion of realism. If we will have time, we could then try to implement some interesting effects, like adding flowers or implement the wind that moves the blades of grass to make the movement look like waves.

Figure 1 Example of real time grass rendering from http://www.kevinboulanger.net/grass.html

2.How

We still have difficulties to know what we are able or not to realize in OpenGl, but the basic idea is the following:

1. We will realize a terrain and a blade of grass as .obj files with an external software like Blender.
2. We will import them in our project.
3. We will implement a particles system on our terrain.
4. For each particle, a blade of grass will be added.

To make our scene look realistic, we should add a texture on our terrain and on our blade of grass. However, if each blade looks the same, the scene would seem too artificial. So we should create a modifier that will apply small variations to our grass blade and apply a cloudy texture on the field of grass (not on each blade) such that there would be regions with darker grass on our terrain. Finally we should make the specular reflection of our grass be yellow.

If we have time, we would like to implement the wind effect. The wind could be implemented as invisible planes that move in one direction and our grass as soft bodies with only the top that is able to move. When there is a contact with a plane and a blade, the top should be moved a little, simulating some wind.

For the flowess, the basic idea is to add a second particle system on our terrain with less particles than the first (each particle being a flower).

So to conclude, this project involves a lot of new knowledge, like particle system, soft bodies and global texturing and we hope it would be realize according to the deadline.