Advanced Image Synthesis

Project Proposal

Codename

Level of Detail and Culling

Description

The goal of this project is to implement a level of detail and a culling algorithm as shown in the lecture. The level of detail technique renders a given object with different geometrical complexities depending on the distance from the object to the viewer (objects far away from the viewer are drawn with low geometrical complexity, while objects near to the viewer are rendered with high geometrical complexity). Culling techniques, on the other hand, try to identify and ignore objects that are not visible under the current viewing conditions.

The developed algorithms will be demonstrated by integrating them into a short real-time demo consisting of one or more scenes. These scenes will be designed to show typical situations where the use of such algorithms pays off.

The objects and textures used for the demo will be generated procedurally to some extent, since this may prove quite convenient especially for the level of detail part of this project (since downscaling-problems can be avoided this way).

The whole project will be developed in C++, using OpenGL.

Optional part

If there is any time left after accomplishing the tasks described above, the whole demo may be enhanced by vertex and fragment shaders to make it visually even more appealing. The Cg toolkit (http://developer.nvidia.com/Cg) will be used to develop these shaders.

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