



SE for High End Rendering

Software Engineering for Parallel, OpenGL GPU-based rendering techniques.

Massively parallel simulations produce large amounts of data for the modeled physical quantities. These large scale data needs to be properly visualized to investigate the system dynamics. In the first stage real-time visualization is used to identify the region of interest. Then the visualization is used to produce movies or high resolution images.

We have developed a visualization program, VolumePerception, to visualize large amount of data (1000^3 voxels). VolumePerception is written in C++ and uses direct

rendering techniques. Furthermore, it is based on OpenGL 2.0, it fully uses GLSL and can be run in parallel on a GPU cluster. To facilitate the use of VolumePerception and easily control the rendering process in real-time, a good multiprocess software design and a GUI are needed. The graphical interface should start and control the rendering process, should provide the computational setup, like the number of employed GPUs and the rendering modes.

VolumePerception will run on a visualization cluster of the CSE Lab (Mac, 4 GPUs) and at CSCS Manno (Linux, 32 GPUs).

SE design skills and creativity will be essential. From this project, you will gain experience in monitoring parallel systems and developing graphical interfaces using QT.

Moreover, you will have the opportunity to interact with large-scale data sets produced by state-of-the-art simulations of fluid flow.

PREREQUISITES

Software Engineering classes

C++ Basics

Interprocess Communication Basics

Independent worker

CONTACT

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