GUI for Interactive Computational Steering

Motivation

The goal of this project is to participate and contribute to the design of a scalable framework for computational steering which will be targeted for the computational engineering domain. The framework as a whole implements a processing pipeline ranging from data processing on HPC simulation engine to interactive visualisation on the visualisation platform and human-computer interaction in different environments (Virtual Reality, e. g.).

To test the real time behaviour of the computational model as response to user interaction for the simulations provided at the Chair for Computation in Engineering, a graphical user interface (GUI) should be developed. This involves implementing functionality for visualising and manipulating the simulation data, adding, removing, and modifying the objects, etc.

Tasks

- get familiar with object-oriented programming in C++ [1]
- get familiar with the Visualization Toolkit (VTK) library [2]
- implement the GUI for information visualisation and changing simulation parameters "on the fly"
- add functionality for interactive modification of 3D geometry

Prerequisites

- knowledge/acquiring the knowledge of C++ programming language

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References

[1] Daoqi Yang: C++ and Object-Oriented Numeric Computing for Scientists and Engineers
[2] http://www.vtk.org/