Interactive Software Visualization

Background

The major topic of this master project is interactive information visualization of complex datasets, such as the static structures or the evolution of large-scale software systems. In particular, this concerns (1) the transfer of existing geovisualization metaphors and hardware-accelerated rendering and interaction techniques to the domain of software visualization and (2) the design and development of a sustainable research framework required for future research in the field of interactive visualization. Participating students get an opportunity to work on promising fields in software engineering and development of interactive rendering systems can individually emphasise their involvement.

Description

The project aims to enhance specific software visualization applications (i.e., the visualization of complex software hierarchies) by improving the rendering process or supporting the development of tools. This includes (but is not limited to) the following tasks:

- Apply level-of-detail and level-of-abstraction concepts and techniques (Figure right), to improve communication and readability of tree-map visualization approaches for complex software systems.
- Advance the design and development of fully hardware-accelerated rendering techniques for massive software maps. This comprises concepts for interactive layouts, generalization, and efficient rendering itself.
- Contribute to the design, planning, and implementation of a new research framework, optimized for scientific prototyping. A feature-rich viewer, providing access to the various applications and projects of the Computer Graphics Systems group will be the centerpiece of that framework.
- Develop a software library of various state-of-the-art image-based rendering techniques for enhancing the visual quality of visualization.

Both areas link to current research and software projects of the HPI's Computer Graphics Systems group. It is especially suited for further research in the context of a master thesis or as preparation for a topic of doctoral thesis. Furthermore, the master project can be used to start working as a student assistant.

Contact

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