

## Indoor Visualization & Software Visualization

This master project is generally concerned with interactive information visualization. There are two (independent) topics that can be addressed:

- Topic 1 aims at developing real-time techniques for *3D visualization of indoor and high-resolution 3D models*; the project is aligned to a research cooperation with the Roomeon project, a high-end professional indoor planning system.
- Topic 2, the automated *software analysis and visualization*, aims at developing new techniques that automatically extract, analyze, and visualize structure, evolution, and run-time behavior of complex software systems. The project is aligned to a joint research project between HPI and SAP Innovation Center.

The students get an extraordinary opportunity to get in touch with one of the most promising fields of software-engineering and system development. The project offers up to 8 students an excellent entry point for research in the fields of software engineering, computer graphics and visualization.

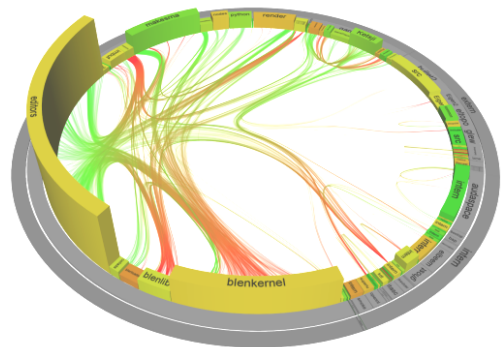
### Indoor Model Visualization

- **Image-Based Synthesis of 3D Indoor Models:** This part of the project aims at developing concepts and techniques to create 3D indoor models from image data that is captured by common consumer cameras or specialized depth cameras (e.g., Microsoft Kinect).
- **3D Data Integration:** This component is an interface to deploy spatio-temporal data to a server, e.g., 3D indoor models, 3D city models, 3D point clouds, and sensor network data.
- **3D Data Analysis:** This component is the central data source for thematic information that results from analysis processes, e.g., visibility, spatio-temporal and usability analysis.
- **Visualization and Stylization Techniques:** These techniques provide specific depth-cues that are essential for the visualization in 3D. They facilitate the spatial relations and shapes of objects.
- **Interactive Visualization Tools:** Tools are based on styling techniques to visualize analysis results and thematic information, e.g., in web-browsers and on mobile devices (Smartphone, Tablets).



### Software Analysis and Visualization

- Visualization techniques that allow for gaining insights into structure and behavior of complex software systems.
- Extraction and preprocessing of massive structural & run-time data based on data mining and filtering strategies.
- Automated software-feature location based on analysis of massive trace data.
- Monitoring of software-development processes and activities based on analyzing source-code repository data, structure data, and behavior data of complex software systems.



Both topics link to current research and software projects of the HPI's Computer Graphics Systems group. They are especially suited for further research in the context of a master thesis or as preparation for a future doctoral thesis. Furthermore, the master project can be combined with working as a student assistant.

### Contact

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