

Processing Massive Data for Visual Analytics

Background

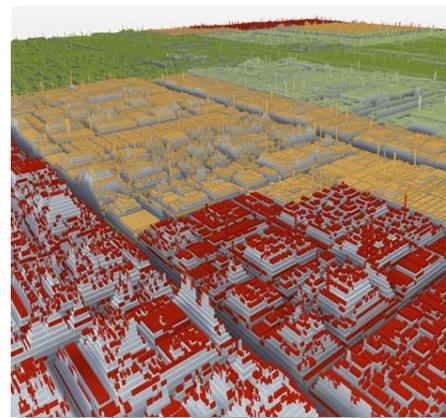
Visual analytics is one of the key technological directions that shape how we can handle, manage, and use big data across different application domains. Efficient algorithms and data structures are essential for an operational system processing big data volumes. This is the master project's overall topic.

Description

This project aims at designing and implementing selected visual analytics high-performance techniques. They are targeted at next-generation tools and applications for visual analytics. The subtopics include:

Efficient Processing of Massive Sensor Data

How to aggregate, and summarize massive sensor data based on measurement time or measurement values while, at the same time, preserving the dataset's key characteristics relevant for visual analytics? How to visualize massive sensor data and its dynamics to assist a user in identifying sensor data patterns (measurements and dynamics) typically preceding failure events? How to derive the criticality of a sensor-observed process and how to map this criticality onto visual variables of a "sensor data map" or "3D plant map". This subtopic is bound to an ongoing joint research project.



Deep Learning Point Cloud Classification

Geospatial Point Clouds represent captured reality by means of unstructured, massive 3D point collections. Separating points into semantic classes allows for more efficient data processing and improved visualization. In addition to traditional metric-based classification processes, deep learning systems can be used to efficiently perform semantic classification on huge datasets. This subtopic can build on previously gained insights and is bound to ongoing joint research projects.



The master project refers to a number of 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 a future doctoral thesis. Further, the master project can lay a foundation for working as a student assistant or software developer at our research partners.

Contact

Research Group Computer Graphics System, Prof. Dr. Jürgen Döllner (office-doellner@hpi.de), Benjamin Hagedorn & Jan Klimke (Sensor Data), and Rico Richter & Johannes Wolf (Point Clouds).