



Hausdorff Forum for Interaction with Mathematical Sciences

February 5, 2016 - 14h

Lipschitz-Saal

14.00h Stefan Wrobel (Bonn, Informatik/Fraunhofer): "Data Analytics in a Networked World"

The age of big data has given an enormous push to statistics, machine learning, and the neighboring analytics disciplines. Yet, big data is still widely perceived as referring primarily to the sheer volume of data. In reality, the true challenges of big data result from the characteristics of the data that we are dealing with. In this talk, we will focus in particular on the fact that today, data points are almost never measurements in isolation, but are part of a networked world, where objects and their relationships are to be taken into account. Consequently, analyzing data that have network or graph structure is becoming of enormous importance, as is the challenge of visualizing such data. In this talk, we will introduce the challenges brought about by network data, and illustrate why in a data-driven economy, linked data will become even more important in the future. We will then present a few examples of methods for analyzing graph-structured data, ranging from pattern enumeration via classification to the visual analysis of graph-structured trajectory data.

15.20h Leif Kobbelt (Aachen, Informatik): "From Quad Meshes to Quad Layouts"

The conversion of raw geometric data (that typically comes in the form of unstructured triangle meshes) to high quality quad meshes is an important and challenging task. The complexity of the task results from the fact that quad mesh topologies are subject to global consistency requirements which cannot be dealt with by local constructions. This is why recent quad meshing techniques formulate the mesh generation process as a global optimization problem. By adding hard and soft constraints to this optimization, many desired properties such as structural simplicity, principal direction alignment, as well as injectivity can be guaranteed by construction. An even more challenging problem is the computation of quad layouts, where a coarse segmentation of the input surface into essentially rectangular patches is sought which also satisfies global consistency and shape quality requirements. While being structurally related, both problems need to be addressed by fundamentally different approaches. In my talk I will present some of these approaches and demonstrate that they can generate high quality quad meshes and quad layouts with a high degree of automation but that they also allow the user to interactively control the results by setting boundary conditions accordingly.