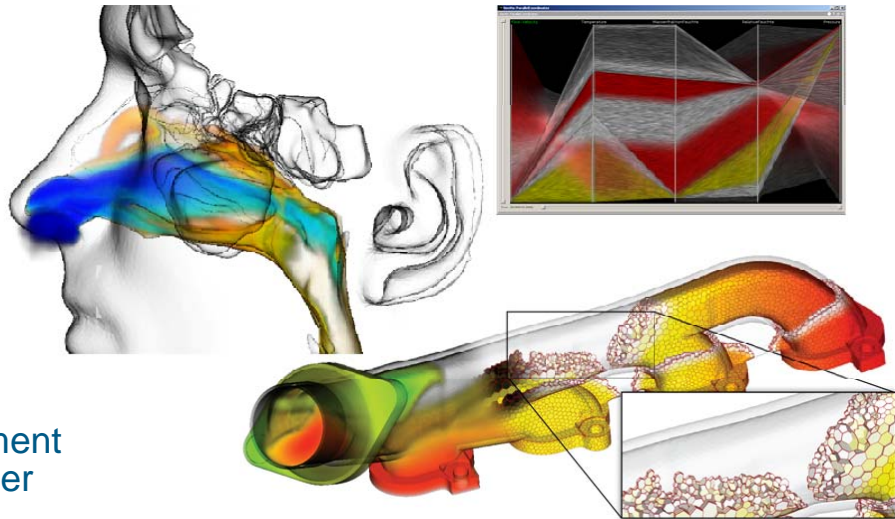UNIVERSITAS BERGENSIS

Philipp Muigg

Coping with Real World Data:
Challenges for a Visualization Framework Originating in Basic Research

Thu., **2010-06-17**, **14h15**–15h

Store Aud. (room **2144)**, **Høyteknologisenteret
(**data blokk, 2nd floor**),
Thormøhlensgate 55

Abstract:

The SimVis framework is a visualization system which has been created in a basic research environment at the VRVis Research Center in Vienna, Austria.

This talk will give an overview over a real world application scenario and the related challenges of coping with large amounts of data without any apriory knowledge. The basis for this application is a transient CFD model of the nasal airways and the upper respiratory trackt which has been used to simulate nasal breathing. Besides air velocity this model also incorporates additional phyical quantities such as temperature and humidity. This results in a large amount of data that had to be explored in order to extract some first hypothesis about the process of nasal breathing. After this first application example the talk will present some solutions for coping with the recent development, in state of the art CFD simulation packages, of switching to general polyhedral simulation grids. As the name implies cells within such grids can consist of an arbitrary number of faces which can be non-planar and in turn can be composed of an arbitrary number of vertices. This poses some complex problems for visualization approaches such as raycasting based direct volume rendering. A general compact data representation for such grids will be discussed and an interactive GPU based implementation of a raycasting system for direct volume rendering will be demonstrated.