Feb. 5th: Invited Talk

Stefan Bruckner,
Vienna University of Technology, Austria

Interactive Illustrative Volume Visualization

Thu., **2009-02-05**, **14h15**–15h

Store Aud. (2144),
Høyteknologisenteret, Thormøhlensgate 55

Abstract:

Illustrations are essential for the effective communication of complex subjects. Their production, however, is a difficult and expensive task. In recent years, three-dimensional imaging has become a vital tool not only in medical diagnosis and treatment planning, but also in many technical disciplines (e.g., material inspection), biology, and archeology. Modalities such as X-Ray Computed Tomography (CT) and Magnetic Resonance Imaging (MRI) produce high-resolution volumetric scans on a daily basis. It seems counter-intuitive that even though such a wealth of data is available, the production of an illustration should still require a mainly manual and time-consuming process. This talk is devoted to the computer-assisted generation of illustrations directly from volumetric data using advanced visualization techniques. The concept of a direct volume illustration system is introduced for this purpose. Instead of requiring an additional modeling step, this

system allows the designer of an illustration to work directly on the measured data. Abstraction, a key component of traditional illustrations, is used in order to reduce visual clutter, emphasize important structures, and reveal hidden detail. Low-level abstraction techniques are concerned with the appearance of objects and allow flexible artistic shading of structures in volumetric data sets. High-level abstraction techniques control which objects are visible. For this purpose, novel methods for the generation of ghosted and exploded views are introduced. Th visualization techniques presented in this talk employ the features of current graphics hardware to achieve interactive performance. The resulting system allows the generation of expressive illustrations directly from volumetric data with applications in medical training, patient education, and scientific communication.