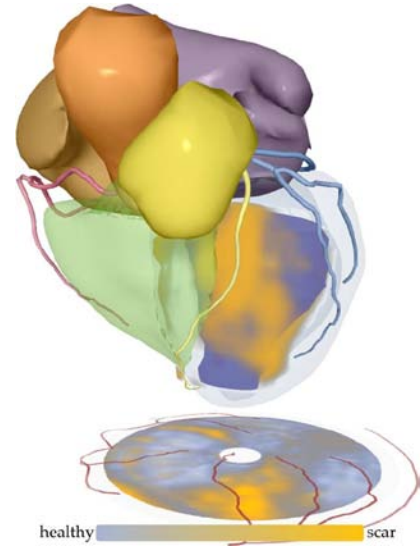UNIVERSITAS BERGENSIS

Prof. Eduard Gröller
Vienna Univ. of Technology

Comprehensive Visualization of Cardiac MRI Data

Fri., **2010-05-21**, **12:15**
Auditorium A, rom nr. A114 (A66:AA)
Allégaten 66

healthy — scar

Abstract:
Coronary artery disease is one of the leading causes of death in the western world. The continuous improvements in magnetic resonance imaging (MRI) technology facilitate more accurate diagnoses by providing increasingly more detailed information on the viability, functioning, perfusion, and anatomy of a patient's heart. The talk covers several novel techniques that realize multi-modal visualizations of a patient's heart to assist in the diagnosis of coronary artery disease . A volumetric bull's eye offers a more comprehensive view on the viability of a patient's heart by providing detailed information on the transmurality of scar while not suffering from discontinuities. Anatomical context is often lost due to abstract representations of data, or may be scarce due to the nature of the scanning protocol. Several techniques to restore the relation to anatomy are presented. The primary coronary arteries are segmented in a whole heart scan and mapped onto a volumetric bull's eye plot, adding anatomical context to an abstract representation. Similarly, segmented late enhancement data are rendered along with a three-dimensional segmentation of the patient-specific myocardial and coronary anatomy. Additionally, coronary supply territories are computed from patient-specific data as an improvement over models based on population averages. Information on the perfusion of the myocardium provided by MRI is typically of fairly low resolution. Using high-resolution anatomical data, an approach to visualize simulated myocardial perfusion is presented, taking full advantage of the detailed information on perfusion. Finally, a truly comprehensive visualization of a cardiac MRI exam is explored by combining whole heart, late enhancement, functional, and perfusion scans in a single visualization.

MEDVIZ FROM VISION TO DECISION