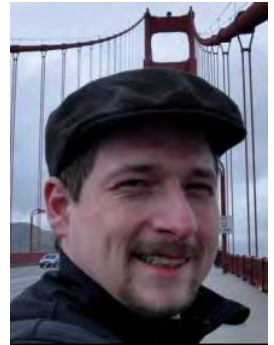


laden gemeinsam zum

GASTVORTRAG

Bernhard Kainz
Imperial College London**“Fetal MRI: Fast volumetric super-resolution reconstruction of organs from moving subjects”****Abstract:**

Magnetic Resonance Imaging (MRI) is a primary tool for clinical investigation of the brain and fetal organs. High resolution imaging with volumetric coverage using stacks of slices or true three dimensional (3D) methods is widely available and provides rich data for image analysis. However such detailed volumetric data generally takes several minutes to acquire and requires the subject to remain still or move only small distances during acquisition. Fetal organ imaging introduces a number of additional challenges. Maternal breathing may move the fetus and the fetus itself can and does spontaneously move during imaging. These movements are unpredictable and may be large, particularly involving substantial head and body rotations. Motion correction methods have revolutionized MRI of the fetus by reconstructing a high-resolution 3D volume of fetal organs from such motion corrupted stacks of 2D slices. Such reconstructions are valuable for both clinical and research applications. However, reconstruction is computationally expensive and can only be performed off line. Information about the accuracy of the scan and potential uncertainties is unknown or not considered in the clinical practice.

In this talk I will discuss the fundamentals of fetal MRI reconstruction and it's parallelization and hardware acceleration for a future on-line application during the scan. Furthermore, I am looking forward to a discussion about potential application of novel visualization techniques to communicate varying uncertainties of the reconstruction to examining radiologists and scientists.

Biography:

Bernhard Kainz is a Marie-Curie Fellow at Imperial College London, UK. His current research is on foetal MRI real-time image processing in the group of Prof. Daniel Rueckert. He performed his Ph.D.-Thesis within the field of medical visualization, volume graphics and GPU algorithms in the team of Prof. Schmalstieg at the Institute for Computer Graphics and Vision at Graz University of Technology. His research interests are the interconnection of medical image data acquisition, fast GPU accelerated medical image processing and interactive real-time medical visualization.

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