



FROM VISION TO DECISION

SEMINAR FRIDAY 17.06.11

PLACE: Aud PI, Department of Mathematics, Johannes Brunsgt. 12

TIME : 12:15-13:15

SPEAKERS:

1. Sebastian Schäfer , Otto-von-Guericke University Magdeburg
2. Erlend Hodneland/ Antonella Z. Munthe-Kaas, Univerisy of Bergen

TITLE:

1. Image processing in medical applications using a priori information
2. In vivo estimation of glomerular filtration in the kidney using DCE-MRI

ABSTRACT:

1. The presentation briefly discusses key tasks in medical image processing with a closer look on how knowledge about the data or its behavior can be included when solving a problem. Referring to completed and ongoing projects in our group, different strategies will be demonstrated exemplarily. In the following, the problem of motion influence in dynamic medical imaging is addressed. Preliminary work and future work in image registration to compensate for those motion artifacts is presented.

2. In this work we present a pipeline for voxelwise computation of in vivo GFR using DCE-MRI. We apply fully automated elastic image registration with normalized gradient fields for motion correction. Kidney segmentation is performed using semiautomated nearest-neighbor segmentation. GFR is computed from pharmacokinetic modeling using two different models, and the obtained values are compared across time points and subjects, and between left and right kidney. The processing pipeline gives promising voxel-wise GFR estimates, but there are challenges related to numerical stability, calculation of concentration curves from signal intensities, and validation issues.

