Master Thesis in Digital Liver Phantom Development for CT

Institution: Computer Assisted Clinical Medicine, Heidelberg University, Germany
Start date: flexible
Duration: flexible

Profile:
Applicants will be candidates in physics, computer science, mathematics, biomedical engineering or a related field; knowledge of a programming language is required; ideally MATLAB; basic knowledge of CT physics is a plus.

Project Description:
Simulation of imaging procedures is a key element in the development of new imaging techniques. Especially, in Computed Tomography where human experimentation is not allowed due to radiation exposure, anthropomorphic phantoms are essential. However, most phantoms used in simulations are made from geometric simplices which do not resemble human anatomy. A digital phantom of the human body is required. The project aims to construct the phantom based on data from patient scans. While the focus is set on the liver, the overall goal is a functional digital phantom of the abdomen. The project can be executed in German or English.

Working Environment:
Our group is composed of more than thirty scientists from physics, electrical engineering, medicine and computer science and is working in close co-operation with the local medical departments. We are developing new imaging techniques and translate them with our clinical partners into daily practice. In particular, we are doing basic research on the development of novel MR-techniques for measuring perfusion, diffusion, BOLD + oxygenation, and sodium in the human brain or other organs like lung, liver or heart. Tasks include the implementation of novel MRI techniques at whole body MRI systems (Siemens) at different field strengths (3x 1.5 Tesla; 2x 3.0 Tesla) with transfer to a small bore animal system 9.4 T (Bruker) for mice and rats. Beside this we are developing molecular innovative imaging technologies by fusion of several imaging modalities (CT, MRI, PET) to enable image-guided, high-precision interventions using high-end CT and robotic systems (ZEEGO, Siemens). Ongoing collaborations with other researchers involve the Central Institute of Mental Health (ZI, Mannheim), the German Cancer Research Centre (DKFZ, Heidelberg), and across Europe with multiple opportunities to visit leading international laboratories and to attend taught schools.

Interested?
If you enjoy working in an interdisciplinary, young, creative and open team, we are looking forward to your application! For more information on the project or for application please contact:

Project leader:

Dipl. Phys. Khanlian Chung
Computer Assisted Clinical Medicine,
Medical Faculty Mannheim, Heidelberg University,
Theodor-Kutzer-Ufer 1-3, 68167 Mannheim, Germany
Tel.: +49 621 383 6552
E-Mail: khanlian.chung@medma.uni-heidelberg.de
Web: http://www.ma.uni-heidelberg.de/inst/cbtm/ckm/

Director:

Prof. Dr. rer. nat. Lothar Schad
Chair in Computer Assisted Clinical Medicine,
Medical Faculty Mannheim, Heidelberg University,
Theodor-Kutzer-Ufer 1-3, 68167 Mannheim, Germany
Tel.: +49 621 383 5121
E-Mail: Lothar.Schad@MedMa.Uni-Heidelberg.de
Web: http://www.ma.uni-heidelberg.de/inst/cbtm/ckm/