PhD-project funded by the German Research Foundation (DFG)

**Topic:** Quantification of cerebral tissue oxygenation for MRI-guided radiotherapy

**Place of work:** Computer Assisted Clinical Medicine, Mannheim, Germany

**Duration:** 12 months (second and third year will be financed by the institute)

**Starting date:** Beginning of 2016

**Project**

Image-guided radiotherapy is recognized to improve radiation therapy with increasing precision and therefore outcome. In particular, Magnetic Resonance Imaging (MRI) can provide valuable morphological and functional information on the tumor which can be incorporated in therapy planning or therapy response assessment.

Therein, the oxygen-extraction-fraction (OEF) is of great clinical interest providing a possible biomarker for brain tissue viability with particular value for the evaluation of diseases such as stroke, Alzheimer’s disease and different tumor entities. Compared to existing methods, the major advantage of MRI based OEF mapping is that it can be performed non-invasively and at high spatial resolution. The objective of this project is to develop robust MRI methods for OEF mapping to identify tumor core regions and thereby guide radiotherapy.

**Prerequisites**

Candidates should have a strong background in Mathematics, Physics, or Computers Science and knowledge of programming in languages such as C/C++ and MATLAB.

**Research Group**

The Medical Faculty Mannheim at Heidelberg University has a strong focus on Medical Technology and uses medical imaging for modern diagnostics as well as treatment planning and monitoring. Our group is doing basic research in developing new MR-techniques for measuring perfusion, diffusion, oxygenation, and X-Nuclei (sodium, chlorine, potassium) in the human brain or other organs like lung, liver, or heart. We are composed of scientists from physics, electrical engineering, and computer science and work in close co-operation with the local medical departments. We have know-how and expertise in fundamental MR-physics, MR-sequence programming, and data post processing and its application in in-vivo animal/human studies.

**Contact**

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