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MANNHEIM

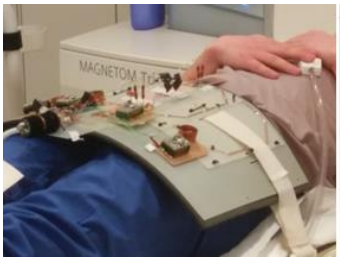
Medizinische Fakultät Mannheim
der Universität Heidelberg

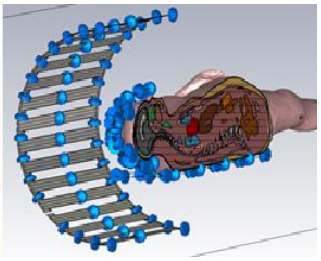
Universitätsklinikum Mannheim

PhD Thesis in RF coils for preclinical and clinical MRI

Institution: Computer Assisted Clinical Medicine, Heidelberg University, Germany
Start date: flexible
Duration: 3 years

Profile: Applicants will hold a Master degree in physics, electrical engineering, biomedical engineering or a related field; basic knowledge of electrical engineering and electromagnetic fields is required; willingness to work in an electrical lab, learn to work with electromagnetic simulations as well as an affinity towards practical measurements are expected; basic knowledge of MRI physics is a plus.





Project Description: High sensitivity receiver MRI coils are important for most of clinical imaging protocols and especially for X-nuclei MRI. Additionally efficient transmit coils are needed for preclinical and clinical X-nuclei MRI. The project will include two main tasks. First, development of transmit-receive systems for preclinical high-field (9.4 T) X-nuclei MRI (19F, 23Na, 35Cl, 19K) for application of small animal MRI and MR spectroscopy of living cell cultures. Second, development of double resonant (1H/23Na) receive systems for clinical MRI and implementation of new methods for increasing SNR (orthogonal coils, matching strategies).

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:

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