

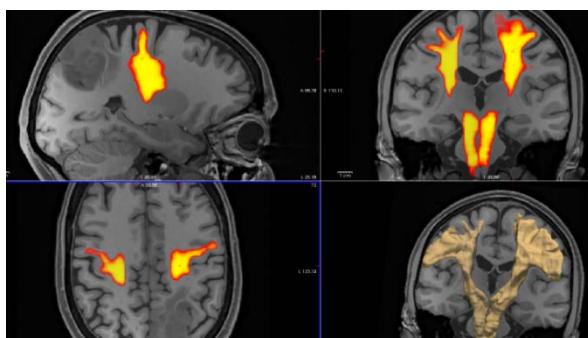


Master Thesis

„White matter tract segmentation for neuro-surgical pre-operative planning“

Project description

In neuro-surgical pre-operative planning (e.g., tumor resection), it is crucial to identify and locate important nerve fiber bundles in the patient's brain. This information helps to make decisions for the operation procedure, shows possible difficulties during the intervention and might help in the prediction of the treatment outcome (quality of life). White matter tracts are typically segmented from diffusion weighted MR-Imaging data, which are acquired before surgery. On the basis of an available trained deep-neural-network, several dozen white matter fiber bundles are segmented from these input data. The main task in the project will be to evaluate the whole processing pipeline in cooperation with experts from neuroradiology and neurosurgery. In a next step then the network should be re-trained to segment white matter tracts, which are not recognized by the current network implementation.



Place of work

Medical Physics Group
Institute for Diagnostic and Interventional Radiology
University Hospital Jena
Philosophenweg 3
07743 Jena
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Your profile

- B.Sc. degree in physics, computer science, mathematics, biomedical engineering or related fields
- Interest in medical imaging, image processing and analysis
- Strong computer skills and interest in programming scripts/automation is desired
- Ability to study scientific literature

Working environment

The Medical Physics Group in the Institute for Diagnostic and Interventional Radiology (IDIR) at the University Hospital Jena conducts interdisciplinary research in tomographic imaging methods, especially MRI. The group consists of a multi-disciplinary team of ambitious young scientists from the fields of physics, engineering and biology. The aim of our research activities is the development and provision of new methods to qualitatively and, where possible, quantitatively assess morphologic and functional parameters and thereby contribute to improved diagnostics and therapy.

You will be working at our MRI research center with a state-of-the-art 3T whole-body clinical MRI system and our high performance computation system. Most of the involved software-tools (scripts, core application etc.) are already available.

Project leader

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Group leader

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