Karlsruhe Institute of Technology

Master Thesis

IAM
Institute for Applied Materials

Lung Segmentation in Morphological MRI Images Using Self-Organizing-Maps

Background:
For the analysis of medical images, a good segmentation of the areas to be examined is of great importance. However, manual segmentation by a radiologist takes a lot of time, which means that automatic segmentation methods are gaining in importance.

Fig.: MRI Lung Segmentation
(Source: Cosyconet)

Your tasks:
Using self-organizing maps (SOMs), an algorithm for automatic segmentation of the lung in morphological MRI images should be developed. For this purpose, promising work in the field of SOM segmentation should be identified and analyzed first, which will then be adapted to lung segmentation and implemented in practice. The reproducible generation of this algorithm will be supported by the usage of the in-house developed research data management tool Kadi4Mat.

Qualifications:
For the processing of the topic basic machine learning knowledge is advantageous but not strictly necessary. Programming experience in a higher programming language (ideally Python) is mandatory. Additionally, interest in medical research should be present.

We offer:
- Intensive support
- Modern workstations and high-performance computers as working environment
- Productive and dynamic atmosphere in a team
- Cooperation with international research groups
- Cooperation with a clinical research institute
- Career perspectives as young scientist

Interested?
Please contact:

Julian Grolig
julian.grolig@kit.edu

Prof. Dr. Britta Nestler
britta.nestler@kit.edu