Karlsruhe Institute of Technology

Thesis

IAM
Institute for Applied Materials

Automatic Characterization of Contrast Media Passage in Lung Perfusion MRI Using Machine Learning

Background:
In clinical routine dynamic MRI images of the lung are acquired during the passage of a previously injected contrast media through the pulmonary and coronal blood vessels, to investigate the lung function. For the analysis of these images, it is important to determine the point of contrast media arrival and complete passage.

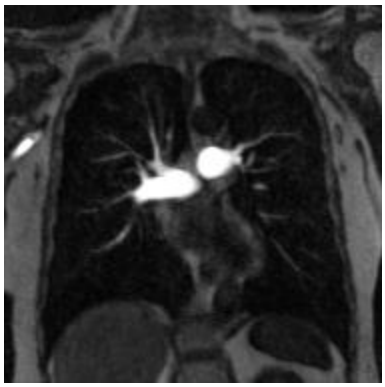

Fig.: Dynamic Perfusion-MRI
(Source: Cosyconet)

Your tasks:
Within the scope of this work, machine learning methods should be used to automatically detect the contrast media arrival and complete pass. For this purpose, suitable parameters must be identified in a first step and need to be further analyzed regarding their predictive power. 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?
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