



Bachelor/Master Thesis

“Machine learning-assisted automated quality control of MR imaging data”

Background

We have re-invented automated postprocessing tools for MRI dedicated with workflows for the atlas-based analysis of structural and functional imaging data (AIDA), e.g. AIDAmri and AIDAconnect (Pallast et al. 2019; Scharwächter et al. 2022). What was missing was a tool to automatically compare large amounts of MRI data, e.g., in terms of signal-to-noise ratio and movement during the image acquisition. This is critically to exclude bad quality data compromising data analysis and dataset reliability.

Approach

Your project will build upon the first version of an automated quality control tool: AIDAqc ([GitHub Link](#)) and is part of a large community-driven initiative to promote standardization and quality control in preclinical MRI ([GitHub Link](#)).

Tasks: You will apply AIDAqc on a large phantom dataset. The phantom data was acquired by international labs with the aim to quantify variability in image quality over time. Your task will be to adapt the algorithms and code of AIDAqc to this scenario. In case of a Master thesis, you will additionally optimize the AIDAqc calculations, e.g. in terms of processing speed, include more measures of image quality, and increase the versatility of the tool to accept more MRI sequences.

You

- Strong interest in neuroimaging
- Good knowledge of Python
- Prior experience in imaging data processing would be an advantage

Send your motivation letter, CV, and transcript of records to

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Related references:

Pallast et al. Front. Neuroinform 2019 [[Link](#)], Scharwächter et al. Neuroimage 2022 [[Link](#)]