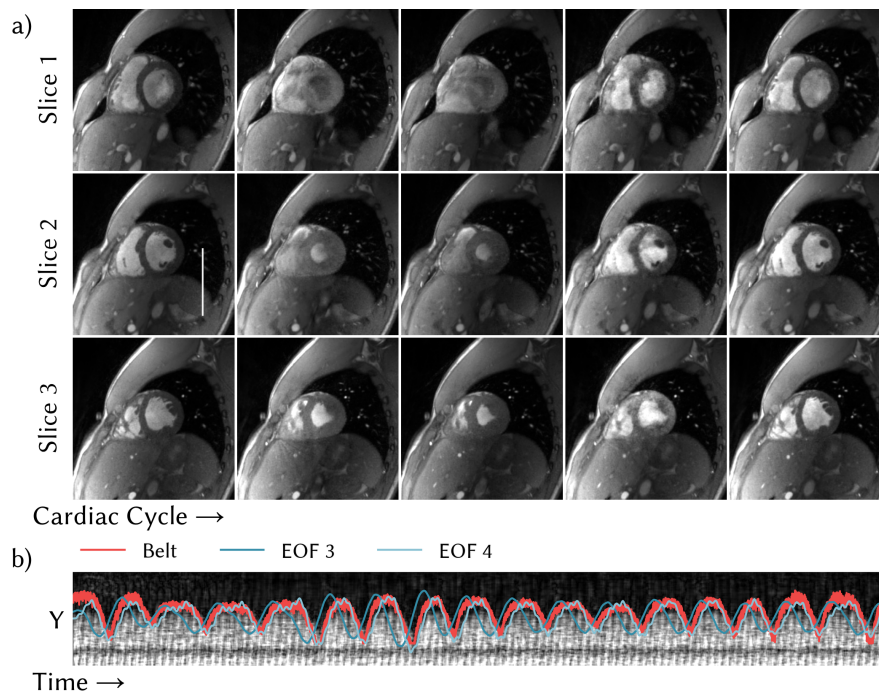


# Master's Thesis:

## Improving Real-time MRI with Machine Learning Using Self-Gating for Training

### Overview

Deep learning has emerged as a powerful tool for image reconstruction in MRI. A fundamental requirement for training deep learning models is the availability of large amounts of high-quality training data. Acquisition of such data is challenging, especially for moving organs such as the heart. In this project, we aim to acquire a high-quality training dataset for real-time MRI of the heart by using a self-gating approach to sort acquired k-space data in cardiac and respiratory motion states. Afterwards, a deep learning model will be trained on this dataset to perform real-time MRI reconstruction on data which is not gated.



### Specific tasks

- Literature research on existing methods for deep learning real-time MRI methods
- Familiarization with existing SSA-FARY self-gating reconstruction algorithms
- Acquisition of larger training dataset
- Training of existing or extended deep learning model on the acquired dataset
- Documentation and illustration of the results

### Recommended Knowledge

- Knowledge on MRI reconstruction and MRI physics
- Basic programming experience
- Basic knowledge on deep learning

### Contact

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