Bachelor's Thesis:
Evaluation of Self-Supervised Reconstruction Network

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Overview

In recent years, deep-learning has become an integral part of MR image reconstruction. Neural networks are trained to reconstruct high-quality images $\mathbf{x}$ from few k-space data $\mathbf{y}$ and thereby reduce the scanning time. Recently, self-supervised training strategies emerged which allow for training MRI-Reconstruction networks without fully sampled ground truth data which is critical for example for real-time data.

The aim of this bachelor thesis is to investigate the performance of NLINV-Net (a self-supervised network proposed by our group) on publically available k-space data. As NLINV-Net jointly estimates the coil-sensitivity maps, a special focus will be the evaluation of these coil-sensitivity maps.

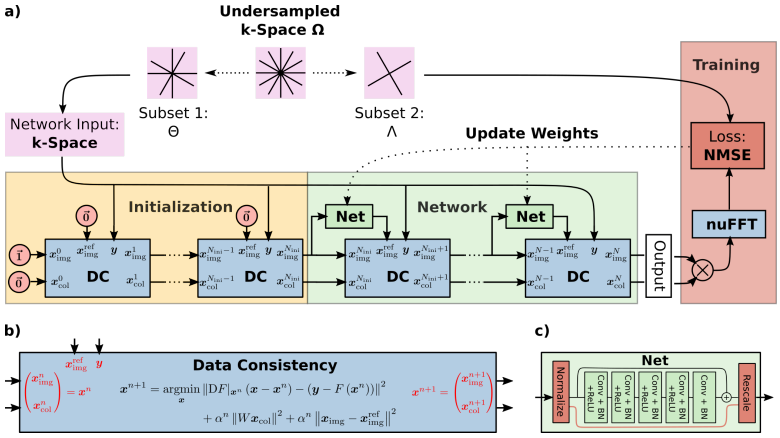

Figure 1: NLINV-Net structure and self-supervised training strategy

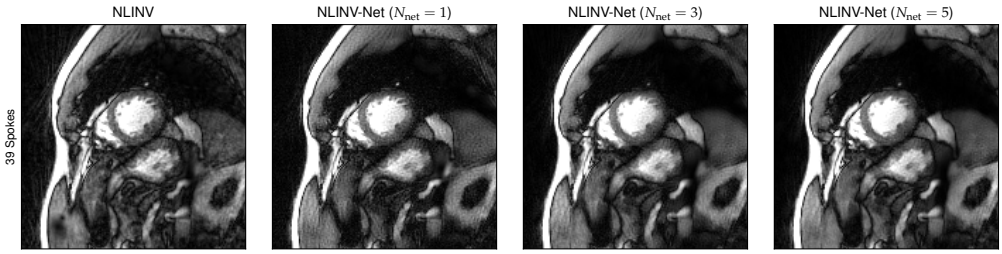

Figure 2: Example reconstructions of cardiac real-time dataset

Specific tasks

- Investigation of existing code base
- Train and evaluate NLINV-Net on publically available datasets
- Evaluate estimated coil-sensitivity maps
- Documentation and illustration of the results

Recommended Knowledge

- Basic experience on neural networks
- Interest in deep-learning with application to MRI

Contact

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