

Master's Thesis:

Image Reconstruction for Arterial Spin Labeling



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Overview

The aim of the master thesis is to implement existing MRI image reconstruction techniques into the BART framework, an open source MR image reconstruction toolbox, and testing it. The algorithms currently exist in Python and OpenCL while BART is written in C. Additionally, BART is a very developed toolbox with specific approaches to image reconstruction, so the code cannot be translated 1:1, but must be adapted. Afterwards, the different implementations must be compared in results and speed on simulated and measured data.

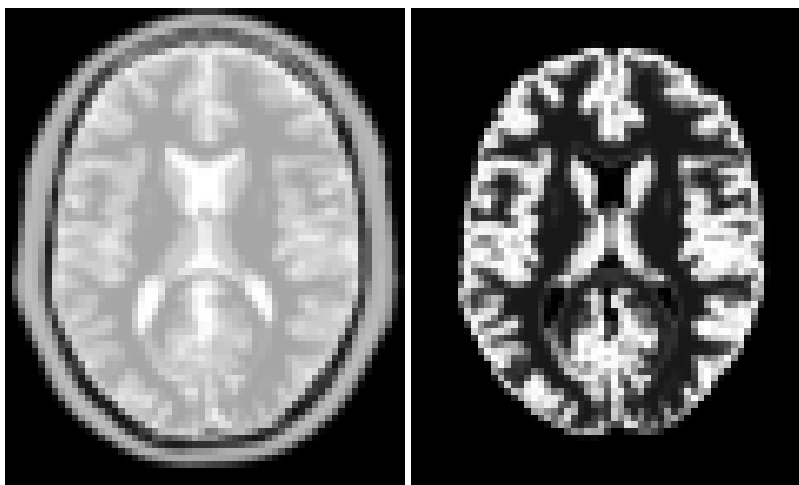
The image reconstruction algorithms are tailored to a specific variant of MR imaging, Arterial Spin Labeling, which means that the algorithms have unusual features which may require additional functions to be implemented in BART.

Specific Tasks

- Understanding the existing reconstruction algorithm
- Learning how BART implements image reconstruction algorithms
- Implementing the algorithm in BART
- Testing the different implementations for results and speed
- Documentation and illustration of the results

Recommended Knowledge

- C or C++ programming
- Interest in MR and image reconstruction
- Basic git workflow



Example of two images produced from an Arterial Spin Labeling image reconstruction (simulated data)

Contact

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