

2nd BART Webinar

Introduction

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Purposes: rapid prototyping, reproducible research, clinical translation (research use only)

Components: programming libraries and command-line tools for calibration, reconstruction, and more

Availability:

- ▶ Linux, MacOS X, (Windows)
- ▶ BSD license (free for commercial use)
- ▶ <https://mrirecon.github.io/bart/>

Research Support

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Updates: Reproducible Research



- ▶ ISMRM Reproducible Research Study Group
 - ▶ Reproduce a Seminal Paper Challenge: CG-SENSE
 - ▶ ISMRM 2020: Member-Initiated Symposium
- ▶ Magnetic Resonance in Medicine
 - ▶ "Data Availability Statement"
 - ▶ MRM Highlights
- ▶ BART Toolbox
 - ▶ ISMRM 2020: 48 abstracts using/citing BART!
 - ▶ List of reproducible papers using BART:

Reproducible Research

This is a list of research paper which can be reproduced using BART.

- Xiaoqing Wang, Sebastian Rosenzweig, Nick Scholand, H.Christian M.Holme, Martin Uecker. [Model-based Reconstruction using Single-shot Inversion-recovery Radial FLASH](#), Magnetic Resonance in Medicine. Early access. [GitHub repository](#)
- Sebastian Rosenzweig, Nick Scholand, H. Christian M. Holme, Martin Uecker. [Cardiac and Respiratory Self-Gating Spectrum Analysis \(SSA-FARY\)](#). IEEE Transactions on Medical Imaging ;39:3029-3041 (2020) [GitHub repository](#)
- Xiaoqing Wang, Florian Kohler, Christina Unterberg-Buchwald, Joachim Lotz, Jens Frahm, Martin Uecker. [Model-based reconstruction of single-shot inversion-recovery radial FLASH cardiovascular magnetic resonance](#). Journal of Cardiac MRI. [GitHub repository](#)

- ▶ I hope I can add your paper to this list soon!




- ▶ Model-based Reconstruction (linear + non-linear)
- ▶ Machine Learning (stay tuned!)
- ▶ Language Bindings (Python, etc.)
- ▶ Improved Parallelization (GPU, Cluster, etc.)

- ▶ Webinar 1, June 1 and 2, 2020

- ▶ Webinar 2, December, 2020

<https://github.com/mrirecon/bart-webinars>

Materials and recordings from 1st webinar:

- Part 1:
 - [Recording] Where to find docs, examples, and help (links: [Website](#) + [README](#) + [Documentation](#) + [Tutorials](#) + [Mailing List](#))
 - Discussion of file format and dimensions (links: [README: Data Format](#) + [Documentation: Dimensions](#) + [Source Code: Predefined Dimensions](#))
- Part 2:
 - [Recording] Working with CLI tools and Matlab/Python wrappers [Jupyter Notebook](#) 
 - [Recording] Data preprocessing [Jupyter Notebook](#) 
- Part 3:
 - [Recording] Compressed Sensing and non-Cartesian MRI reconstruction [Jupyter Notebook](#) 
 - [Recording] GRASP-like MRI reconstruction (same Jupyter Notebook as above)
- [Recording] Q&A and Conclusion

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Schedule

- ▶ Introduction (Martin Uecker)
- ▶ SENSE reproducibility challenge (Christian Holme)
- ▶ Hands-on exercise
- ▶ Advanced regularization methods for dynamic MRI data (Efrat Shimron)
- ▶ Hands-on exercise

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