2nd BART Webinar

Introduction

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BART: Software Toolbox for Computational MRI

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

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

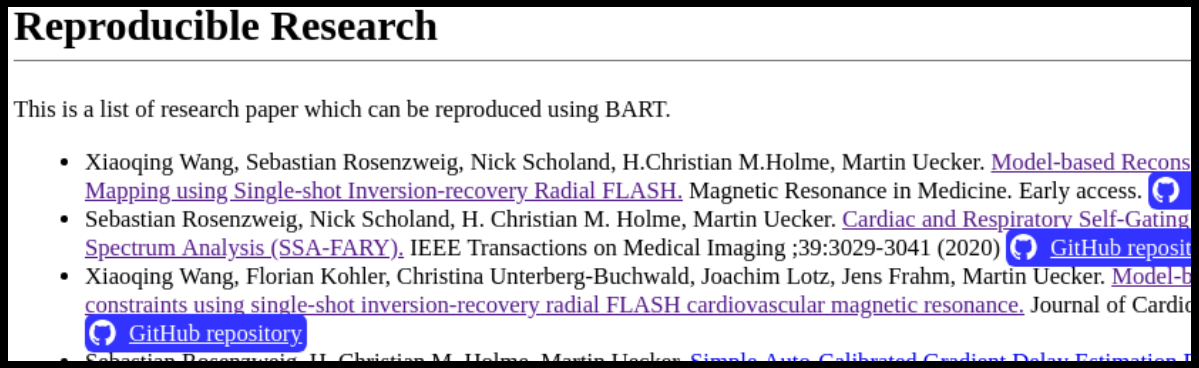
Availability:

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

Research Support
American Heart Association Grant 12BGIA9660006, NIH Grants R41RR09784, R01EB009690, U24EB029240-01, UC Discovery Grant 193037, Sloan Research Fellowship, GE Healthcare, DZHK (German Centre for Cardiovascular Research), DFG (German Research Foundation) Grants UE 189-1-1, UE 189/5-1, 'Niedersächsisches Vorab' Grant ZN3423, and a personal donation from David Donoho's Shaw Prize,

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 Recons Mapping using Single-shot Inversion-recovery Radial FLASH. Magnetic Resonance in Medicine. Early access.
- 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 reposit
- Xiaoqing Wang, Florian Kohler, Christina Unterberg-Buchwald, Joachim Lotz, Jens Frahm, Martin Uecker. Model-b constraints using single-shot inversion-recovery radial FLASH cardiovascular magnetic resonance. Journal of Cardio GitHub repository

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

Updates: Development

BART

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

BART Webinars

- Webinar 1, June 1 and 2, 2020

- Webinar 2, December, 2020

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

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 launch binder
  - [Recording] Data preprocessing Jupyter Notebook launch binder
- Part 3:
  - [Recording] Compressed Sensing and non-Cartesian MRI reconstruction Jupyter Notebook launch binder
  - [Recording] GRASP-like MRI reconstruction (same Jupyter Notebook as above)
- [Recording] Q&A and Conclusion

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Welcome to the 2nd BART Webinar!

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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