Yamin Arefeen

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Education

Massachusetts Institute of Technology — Cambridge, MA
Doctor of Philosophy in Electrical Engineering and Computer Science — *May 2022 (expected)*
Master of Science in Electrical Engineering and Computer Science; GPA: 5.0/5.0 — *May 2019*
Thesis: Acquisition and Reconstruction Techniques for Improving Rapid Magnetic Resonance Imaging

Rice University — Houston, Texas
Bachelor of Science In Electrical Engineering; GPA: 4.0/4.33; Magna Cum Laude — *Aug 2013 - May 2017*

Experience

MIT Magnetic Resonance Imaging (MRI) Group — Cambridge, MA
Doctoral Research Student (Advisor: Elfar Adalsteinsson) — *September 2017 - Present*

- Developed scan-specific machine learning techniques to improve physics-based reconstructions for accelerated MRI.
- Implemented model based reconstruction and acquisition techniques for rapid, T2-weighted fetal MRI.
- Utilized incoherent spiral trajectories and low-rank priors to accelerate 1H-MRSI acquisitions with compressed sensing.

Applied Machine Learning: MIT Course 6.862 — Cambridge, MA
Teaching Assistant (Course Instructor: Iddo Drori) — *February 2021 - Present*

- Directly mentored 27 teams in machine learning projects across a variety of disciplines.
- Delivered tutorials, graded writen reports, and taught a wide range of machine learning concepts.

Rice Senior Design — Houston,TX
Research Member — *September 2016 - May 2017*

- Developed a novel data driven algorithm to detect irregularities in human heart beat from pacemaker data and implemented prototype on invivo rat experiments.

Schlumberger — Houston, TX
Software Engineer Intern — *May 2016 - Aug 2016*

- Developed novel algorithm for data driven fracture model comparison and wrote industry standard code.

Rice Scalable Health Lab — Houston, TX
Research Assistant (Advisor: Ashutosh Sabharwal) — *September 2014 - May 2016*

- Improved motion robustness in camera based heart rate detection using Kalman filtering techniques, won best undergraduate demo at Rice ECE affiliates day 2016.

Rice Fundamentals of Electrical Engineering — Houston,TX
Teaching Assistant — *August 2015 - January 2017*

- Conducted weekly TA sessions and mentored undergraduate students in introductory signal processing topics.

Journal Papers

- **Yamin Arefeen**, Onur Beker, Jaejin Cho, Heng Yu, Elfar Adalsteinsson, Berkin Bilgic. "Scan-Specific Artifact Reduction in K-space (SPARK) Neural Networks Synergize with Physics-based Reconstruction to Accelerate MRI" Magnetic Resonance in Medecine, 2021.

Conference Proceedings

- **Yamin Arefeen**, Borjan Gagoski, Elfar Adalsteinsson. "Accelerating 3D 1H-MRSI Using Randomly Undersampled Spatial and Spectral Spirals with Low-rank Subspaces" Accepted in International Society for Magnetic Resonance in Medecine, 29th Scientific Meeting, Virtual, 2021.
- **Yamin Arefeen**, Tae Hyung Kim, Justin Haldar, Ellen Grant, Borjan Gagoski, Berkin Bilgic, Elfar Adalsteinsson. "Rapid Fetal HASTE imaging using variable flip angles and simultaneous multislice wave-LORAKS" Accepted in International Society for Magnetic Resonance in Medecine, 29th Scientific Meeting, Virtual, 2021. (*Summa Cum Laude*, Review Scores in Top 5%)
- **Yamin Arefeen**, Onur Beker, Heng Yu, Elfar Adalsteinsson, Berkin Bilgic. "Extending Scan-Specific Artifact Reduction in K-space (SPARK) to Advanced Encoding and Reconstruction Schemes" Accepted in International Society for Magnetic Resonance in Medecine, 29th Scientific Meeting, Virtual, 2021.

- Heng Yu, Zijing Dong, **Yamin Arefeen**, Congyu Liao, Kawin Setsompop, Berkin Bilgic. "eRAKI: Fast Robust Artificial Neural Networks for K-space Interpolation (RAKI) with Coil Combination and Joint Reconstruction" Accepted in International Society for Magnetic Resonance in Medecine, 29th Scientific Meeting, Virtual, 2021.
- **Yamin Arefeen**, Borjan Gagoski, Esra Turk, Ellen Grant, Kawin Setsompop, Elfar Adalsteinsson. "Single-shot T2-weighted Fetal MRI with variable flip angles, full k-space sampling, and nonlinear inversion: towards improved SAR and sharpness." Accepted in International Society for Magnetic Resonance in Medecine, 28th Scientific Meeting, Paris, 2020.
- **Yamin Arefeen**, Fei Han, Borjan Gagoski, Jacob White, Elfar Adalsteinsson. "Improving cartesian single-shot 2D T2 shuffling and reducing radial streaking artifacts with golden angle radial T2 shuffling." Accepted in International Society for Magnetic Resonance in Medecine, 28th Scientific Meeting, Paris, 2020.
- **Yamin Arefeen**, Nick Arango, Siddharth Iyer, Borjan Gagoski, Kawin Setsompop, Jacob White, Elfar Adalsteinsson. "Refined-subspaces for two iteration single shot T2-Shuffling using dictionary matching." International Society for Magnetic Resonance in Medicine, 27th Scientific Meeting, Montreal, 2019.
- **Yamin Arefeen**, Philip Taffet, Daniel Zdeblick, Jorge Quintero, Greg Harper, Behnaam Aazhang, Joe Cavallaro, Mehdi Razavi, "Real-time Data-driven System to Learn Parameters for Multisite Pacemaker Beat Detection", Asilomar Conference on Signals Systems and Computers, 2017.

Honors and Awards

National Science Foundation Graduate Research Fellow 2018-2022
Hewlett Packard MIT Graduate Fellowship, 2017
Phi Beta Kappa Honor Society, 2017
Texas Society of Professional Engineers Outstanding Senior, 2017
Eta Kappa Nu Honor Society, 2016
Louise J. Walsh Scholarship, 2016
President's Honor Roll (Rice University), 2014-2017
National Merit Scholar

Skills

Languages: Python, Matlab, Mathematica, C **Software**: PyTorch, Latex