Soudabeh Kargar, Ph.D.

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SUMMARY

- 10+ years of experience in MRI research and development
- Outstanding interpersonal and communication skills

EDUCATION

Mayo Graduate School, Rochester, MN (Ph.D. in Biomedical Eng. and Physiology)	2019
University of Alabama in Huntsville, Huntsville, AL (M.Sc. in Mechanical Eng.)	2012
Sharif University of Technology, Tehran, Iran (M.Sc. in Earthquake Eng.)	2008
Isfahan University of Technology, Isfahan, Iran (B.Sc. in Civil Eng.)	2005

WORK AND RESEARCH EXPERIENCE

University of Colorado – Anschutz Medical Campus (MRI Image Analyst) – Cancer Center April 2023 – Present

- *MRI Image analysis (pre-clinical research)*
    - I do MRI image analysis for the Cancer Center. This includes overall image quality evaluation and specific MRI image analysis based on the researcher's request. I work with a lot of researchers and help them design the MRI protocol and specify the best measurement in MRI images for their research. I especially enjoy protocol development and optimization for a new project. In case of an artifact in the images, I work on finding a solution to eliminate or reduce the artifact for a better image quality.

Memorial Sloan Kettering Cancer Center (Research Scholar) Feb 2021 – Mar 2023

Lab of Ricardo Otazo, Ph.D.

- *Application of Deep Learning in Perfusion Parameter Estimation for DCE-MRI*
    - Development of Deep Learning model to estimate perfusion parameters for DCE-MRI based on SPGR signal model and Extended Tofts model.
    - Evaluation of the accuracy of the DL model with a custom digital phantom in comparison to a conventional nonlinear least-squares fitting (NLSQ). Calculation of Pearson correlation between the DNN-estimated parameters and the reference values as well as RMSE.
    - Test-retest experiments to assess reproducibility

University of Wisconsin – Madison (Post-doctoral Fellow) Nov 2019 – Nov 2020

Lab of Scott Reeder, M.D., Ph.D.

- *Heavily T2-Weighted Imaging with Phase-Based RF Modulated GRE Imaging*
    - Applied a novel strategy using RF phase modulated gradient echo (GRE) with small RF phase increments to encode T2 information into the phase of the signal.
    - Optimized this strategy for long T2 species to achieve heavily T2-weighted imaging, including the introduction of a novel cross-product strategy to highlight signal in tissues with long T2 and suppress signal in tissues with shorter T2 values.

Mayo Graduate School (Ph.D. student) Jul 2013 – Nov 2019

Lab of Stephen Riederer, Ph.D.

- *Pharmacokinetic Parameter Estimation for Dynamic Contrast-Enhanced MRI*
    - Developed a robust and efficient method for DCE-MRI perfusion parameter estimation for the Tofts and Extended Tofts Model using the Variable Projection (VARPRO) approach.
    - Demonstrated the effectiveness of VARPRO method with numeric simulations, phantoms and in vivo experiments, thus confirming the superiority of my proposed perfusion estimation strategy.

- *Achieving Sub-mm Through Plane Resolution for Prostate Imaging*
    - Improved the through-plane resolution for multi-slice T2-weighted spin-echo (T2SE) imaging, as this imaging technique is limited by its spatial resolution along the slice select direction.
    - Developed a new multi-slice T2SE imaging approach in which only one orientation diagnostic images are acquired and are used to reconstruct the images for the other orientations.
    - Conducted experiments with a prostate phantom, a resolution phantom, and in vivo prostate MRI including 16 patient volunteers using my proposed methodology.
- *Reduced Motion Artifact in Super Resolution T2 FSE Multislice MRI: Application to Prostate*
    - Reduced the "scalloping" artifact that was observed in the previous project due to subtle ≈1 mm motion between passes by subdivision of each pass into multiple segments. Interleaving of segments from the multiple passes causes all slices to be acquired over substantially the same time, reducing pass-to-pass motion effects.
    - Implemented in phantoms and in 14 prostate MRI patients and demonstrated that new segmented acquisition significantly reduces the scalloping motion artifact due to decreases sensitivity to motion by increasing the temporal footprint of the acquisition.

Division of Engineering, Mayo Clinic, Rochester, MN (Intern) Sep 2012 – Jun 2013

Mentor: Dan Dragomir-Daescu, Ph.D.

- *Brain Aneurysm Modeling and Analysis Using Computational Fluid Dynamics (CFD)*
- *Finite Element Analysis (FEA) of Femurs to Predict Fracture Risk in Osteoporotic Patients*

PEER-REVIEWED PUBLICATIONS AND PRESENTATIONS

1. F.M. Walker, L.M. Sobral, E. Danis, B. Sanford, S. Donthula, I. Balakrishnan, D. Wang, A. Pierce, S.D. Karam, **S. Kargar**, N.J. Serkova, N.K. Foreman, S. Venkataraman, R. Dowell, R. Vibhakar, N.A. Dahl, "Rapid P-TEFb-dependent transcriptional reorganization underpins the glioma adaptive response to radiotherapy"
   Nature Communications 15, 4616 (2024). https://doi.org/10.1038/s41467-024-48214-3
2. A.M. Griesingr, A.J. Calzadilla, E. Grimaldo, A.M. Donson, V. Amani, A.M. Pierce, J. Steiner, **S. Kargar**, N.J. Serkova, K.C. Bertrand, K.D. Wright, R. Vibhakar, T. Hankinson, M. Handler, H.B. Lindsay, N.K. Foreman, K. Dorris , "EPEN-24. 5FU Sensitivity Is Mediated Through Trisomy UCK2 Expression In 1Q+ PFA EPN"
   Neuro Oncol. 2024 Jun 18;26(Suppl 4):0. doi: 10.1093/neuonc/noae064.226. PMCID: PMC11183474.
3. O. Cohen, **S. Kargar**, S. Woo, A. Vargas R. Otazo, "DCE-Qnet: Deep Network Quantification of Dynamic Contrast Enhanced (DCE) MRI", Magnetic Resonance Materials in Physics,
   ArXiv:2405.12360v1. Published 2024 May 20.
4. A.M. Griesinger, A.J. Calzadilla, E. Grimaldo, A.M. Donson, V. Amani, A.M. Pierce, J. Steiner, **S. Kargar**, N.J. Serkova, K.C. Bertrand, K.D. Wright, R. Vibhakar, T. Hankinson, M. Handler, H.B. Lindsay, N.K. Foreman, K. Dorris, "Development of Chromosome 1q+ Specific Treatment for Highest Risk Pediatric Posterior Fossa Ependymoma",
   Clinical Cancer Research 30 (8), 1544-1554
5. **S. Kargar**, Lucy Kershaw, A. Fathi Kazerooni, L. Bell, R. Van der Heijden, H. Mutsaerts, O. Gurney-Champion, E. Shalom, A. Paschoal, M.L. Jen, S. Hoodeshenas, N.J. Serkova, P. Van Houdt, Y. Suzuki, and H. Kim, "The ISMRM Open Science Initiative for Perfusion Imaging (OSIPI): A Challenge for Reproducible DCE-MRI AI-based Analysis"
   Proceedings of the 32nd Annual Meeting ISMRM, Singapore, 2024
6. **S. Kargar**, Editorial for" Deep Learning for Discrimination of Hypertrophic Cardiomyopathy and Hypertensive Heart Disease on MRI Native T1 Maps"
   Journal of Magnetic Resonance Imaging: JMRI, 2023, 59(3):849-850
7. **S. Kargar**, O. Cohen, S. Woo, H. Vargas, R. Otazo, "Self-contained comprehensive quantification of dynamic contrast-enhanced MRI using physics+kinetics-based network learning (PKNet)"
   Proceedings of the 31st Annual Meeting ISMRM, Toronto Canada, 2023
8. **S. Kargar**, O. Cohen, R. Otazo, "DCE-DRONE: Perfusion MRI Parameter Estimation using a DRONE Neural Network"
   Proceedings of the 30th Annual Meeting ISMRM, London, UK, 2022

9. E. Borisch, R.Grimm, **S. Kargar**, A. Kawashima, J. Trzasko, S. Riederer, "Iterative Reconstruction for Enhanced Through-Plane Resolution T2-Weighted Spin-Echo Imaging of the Prostate",
Proceedings of the Annual Meeting ISMRM, Virtual Meeting, 2021

10. **S. Kargar**, D. Tamada, R. Navaratna, J. Weaver, S. Reeder, "Heavily T2-weighted Imaging with Phase-Based RF Modulated GRE Imaging",
Proceedings of the 29th Annual Meeting ISMRM, Virtual Meeting, 2021

11. A. Acher, J. Krenzer, K. Kovacs, **S. Kargar**, A. Pirasteh, J. Starekova, T.J. Colgan, V. Rendell, D. Abbott, E. Brooks, R. Agni, E. Winslow, S. Reeder, "Ex Vivo Radiologic-Histologic Correlation of Pancreas Adenocarcinoma: A Feasibility Study"
Proceedings of the 29th Annual Meeting ISMRM, Virtual Meeting, 2021

12. **S. Kargar**, E.A. Borisch, A.T. Froemming, R.C. Grimm, A. Kawashima, B.F. King, E.G. Stinson, S. J. Riederer, 2020, "Modified acquisition strategy for reduced motion artifact in super resolution T2 FSE multislice MRI: Application to prostate",
Magnetic Resonance in Medicine, 2020 May;84:2537-2550.

13. **S. Kargar**, E. Borisch, A. Froemming, R. Grimm, A. Kawashima, B. King, E. Stinson, S. Riederer, "Reduced Motion Artifact in Super Resolution T2 FSE Multislice MRI: Application to Prostate",
Proceedings of the 28th Annual Meeting ISMRM, Virtual Meeting, August 2020

14. E. Borisch, **S. Kargar**, A. Kawashima, S. Riederer, "Motion Correction of T2SE Multi-Pass Acquisitions for Super-Resolution in the Slice Direction",
Proceedings of the 28th Annual Meeting ISMRM, Virtual Meeting, August 2020

15. **S. Kargar**, E. Borisch, A. Froemming, R. Grimm, A. Kawashima, B. King, E. Stinson, S. Riederer, "Segmented Multislice Acquisition for Motion-Insensitive Super Resolution Multislice T2-Weighted Fast-Spin-Echo Imaging"
Proceedings of the AAPM 62nd Annual meeting and exhibition, July 2020, Virtual Meeting
MEDICAL PHYSICS 47 (6), E400-E400

16. K. Pepin, R.C. Grimm, **S. Kargar**, M. Howe, K. Fritchie, M. Frick, D. Wenger, S. Okuno, R. Ehman, K. McGee, S. James, N. Laack, M. Herman, D. Pafundi, 2017, "Soft tissue sarcoma stiffness and perfusion evaluation by MRE and DCE-MRI for radiation therapy response assessment: a technical feasibility study"
Biomed. Phys. Eng. Express 5 (2019) 047003

17. **S. Kargar**, E.G. Stinson, E.A. Borisch, A.T. Froemming, R.C. Grimm, A. Kawashima, S.J. Riederer, 2018, "High Through-Plane Resolution 2D Multislice T2SE Vs. Direct 3D T2SE: Application in Prostate MRI"
Proceedings of the AAPM 61st Annual meeting and exhibition, July 2019, San Antonio, TX
MEDICAL PHYSICS 46 (6), E507-E507

18. **S. Kargar**, E.A. Borisch, A.T. Froemming, R.C. Grimm, A. Kawashima, B.F. King, E.G. Stinson, S. J. Riederer, "High Value T2-Weighted Multislice Spin-Echo Imaging"
Proceedings of the ISMRM Workshop on MR Value, March 2019, Edinburgh, Scotland, UK

19. E.G. Stinson, **S. Kargar**, R.C. Grimm, S. J. Riederer, "On the Selection of Slice Profile for Through-Plane Resolution in Multi-Slice MR Imaging"
Proceedings of the 27th Annual Meeting ISMRM, May 2019, Montreal, QC, Canada

20. **S. Kargar**, E.A. Borisch, A.T. Froemming, R.C. Grimm, A. Kawashima, B.F. King, E.G. Stinson, S. J. Riederer, "Use of kz-Space for Sub-mm Through-Plane Resolution in Multi-slice MRI: Application to Prostate"
Proceedings of the 27th Annual Meeting ISMRM, May 2019, Montreal, QC, Canada

21. **S. Kargar**, E.A. Borisch, A.T. Froemming, R.C. Grimm, A. Kawashima, B.F. King, E.G. Stinson, S. J. Riederer, "Use of kZ-Space for High Through-Plane Resolution in Multislice MRI: Application to Prostate"
Magnetic Resonance in Medicine, 2019 Jun;81(6):3691-3704

22. **S. Kargar**, S. J. Riederer, E.A. Borisch, A.T. Froemming, R.C. Grimm, A. Kawashima, B.F. King, E.G. Stinson, "Use of kZ space for sub-mm through-plane resolution in T2-weighted 2D spin-echo prostate MRI"
Proceedings of the Annual Mtg Europ Cong Radiol, February 27 – March 3, 2019, Vienna, Austria

23. **S. Kargar**, E.A. Borisch, R.C. Grimm, A. Kawashima, E.G. Stinson, S.J. Riederer, "Use of KZ-Space in Multislice MRI for Sub-mm Through-Plane Resolution"

Proceedings of the 104th Scientific Assembly and Annual Meeting of the Radiological Society of North America, November 25-30, 2018, Chicago, USA

24. **S. Kargar**, E.A. Borisch, R.C. Grimm, A. Kawashima, E.G. Stinson, S.J. Riederer, "Use of kZ-Space for Providing Sub-Millimeter Through-Plane Resolution in 2D Multislice Imaging"
Proceedings of the Magnetic Resonance Angiography 30th Annual International Conference, August 28-31, 2018, Glasgow, Scotland

25. **S. Kargar**, E.A. Borisch , R.C. Grimm , A. Kawashima , E.G. Stinson, S.J. Riederer, 2018, "Sub-mm through-plane resolution for multislice T2SE MRI via reconstruction in kz-space"
Proceedings of the Society of Computed Body Tomography & Magnetic Resonance (SCBT-MR) 41st Annual Meeting. Oct 6-10 2018, Washington DC., USA

26. **S. Kargar**, E.A. Borisch , R.C. Grimm , A. Kawashima , S.J. Riederer, 2018, "T2-Weighted Spin-Echo Multislice MRI with Sub-Millimeter Through-Plane Resolution"
Proceedings of the AAPM 60th Annual meeting and exhibition, July 2018, Nashville, TN

27. K. Pepin, R.C. Grimm , **S. Kargar** , M. Howe , K. Fritchie , N. Laack , M. Herman , D. Pafundi, 2018, "Advances in Imaging of Radiation Therapy Response in Soft Tissue Sarcomas Using Magnetic Resonance Elastography (MRE) and Dynamic Contrast-Enhanced (DCE)-MRI"
Proceedings of the AAPM 60th Annual meeting and exhibition, July 2018, Nashville, TN

28. S.J. Riederer , E.A. Borisch , A.T. Froemming , **S. Kargar** , A. Kawashima , and J. D. Trzasko, 2018, "Synthetic 3D reconstruction"
Joint Annual Meeting ISMRM-ESMRMB, June 2018, Paris, France

29. E.G. Stinson , J.D. Trzasko , **S. Kargar** , E.A. Borisch , A.T. Froemming , A. Kawashima , P.M. Young , and S.J. Riederer, 2018, "Dynamic Contrast-Enhanced MRI of the Prostate with Single-Echo Dixon Fat Suppression"
Proceedings of the Joint Annual Meeting ISMRM-ESMRMB, June 2018, Paris, France

30. **S. Kargar**, E.A. Borisch, A.T. Froemming, A.Kawashima, L.A. Mynderse, E.G. Stinson, J.D. Trzasko, S. J. Riederer, 2018, "Robust and efficient pharmacokinetic parameter non-linear least squares estimation for dynamic contrast enhanced MRI of the prostate"
Magnetic Resonance Imaging, 2018 (48), 50-61

31. **S. Kargar**, E.G. Stinson, E.A. Borisch, A.T. Froemming, A. Kawashima, L.A. Mynderse, J.D. Trzasko, S.J. Riederer, 2017, "Robust and Efficient Perfusion Parameter Estimation for DCE-MRI of the Prostate Utilizing the Variable Projection (VARPRO) Method"
Proceedings of the ISMRM 25th Annual Meeting, 22-27 April 2017, Honolulu, HI, USA

32. K. Pepin, R.C. Grimm, **S. Kargar**, S. James, M. Howe, K. Fritchie, M. Frick, D. Wenger, R. Ehman, N. Laack, M. Herman, D. Pafundi, 2017, "MR Elastography and Perfusion MRI for the Early Assessment of Treatment Response in Soft Tissue Sarcomas"
Proceedings of the ISMRM 25th Annual Meeting, 22-27 April 2017, Honolulu, HI, USA

33. **S. Kargar**, E.G. Stinson, E.A. Borisch, A.T. Froemming, A. Kawashima, L.A. Mynderse, J.D. Trzasko, S.J. Riederer, 2016, "Patient-Specific vs. Population-based Arterial Input Function in Perfusion Estimation for DCE-MRI of the Prostate"
Proceedings of the Magnetic Resonance Angiography 28th Annual International Conference, September 21-23, 2016, Chicago, IL, USA

34. **S. Kargar**, E.G. Stinson, E.A. Borisch, A.T. Froemming, A. Kawashima, L. A. Mynderse, J.D. Trzasko, S.J. Riederer, 2016, "Robust and Efficient Pharmacokinetic Parameter Estimation: Application to Prostate DCE-MRI"
Proceedings of the ISMRM 24th Annual Meeting, 7-13 May 2016, Singapore

35. **S. Kargar**, E.G. Stinson, E.A. Borisch, A.T. Froemming, A. Kawashima, L. A. Mynderse, J.D. Trzasko, S.J. Riederer, 2016, "An Efficient Variable Projection Strategy for Pharmacokinetic Parameter Estimation in Prostate DCE-MRI"
Proceedings of the ISMRM Workshop on Data Sampling & Image Reconstruction, Jan 17-20, 2016, Sedona, AZ

36. **S. Kargar**, E.G. Stinson, E.A. Borisch, A.T. Froemming, A. Kawashima, L. A. Mynderse, J.D. Trzasko, S.J. Riederer , 2015, "Robust and Efficient Estimation of Optimum Perfusion Parameters in Dynamic Contrast-Enhanced MRI of the Prostate"

Proceedings of the Magnetic Resonance Angiography 27th Annual International Conference, September 15-18, 2015, Cincinnati, Ohio, USA

37. S. Hodis, **S. Kargar**, D.F. Kallmes, and D. Dragomir-Daescu, 2014, "Artery Length Sensitivity in Patient-Specific Cerebral Aneurysm Simulations"
American Journal of Neuroradiology, AJNR, 36:737– 43 Apr 2015.

38. Hussain, J.L. Kugel, **S. Kargar** , J. Garrity, R. Ehman, 2014, "Magnetic Resonance Elastography of extraocular muscles: a new application"
Proceedings of the British Oculoplastic Surgery Society, BOPSS 2014, Annual meeting June 11th – 13th, Liverpool, UK

39. **S. Kargar**, D.M. Bardot, 2011, "Demonstration of a Modeling Error Extrapolation Method in Verification, Validation and Uncertainty Quantification of a Stress Concentration in a Cantilever Beam"
Proceedings of ASME 2011 International Mechanical Engineering Congress & Exposition IMECE2011, November 11-17, 2011, Denver, Colorado, USA

40. B.W. Gasser, L.E. Bridges, **S. Kargar**, D.M. Bardot, 2011, "Osseointegrated Lower Limb Prosthetic Force Limiting Connection"
Proceedings of BioMed2011, 6th Frontiers in Biomedical Devices Conference, September 26-27, 2011, Irvine, California, USA

41. **S. Kargar**, L.E. Bridges, D.M. Bardot, 2011, "Strategies for Building an Arterial Flow Phantom"
Proceedings of Biomed2011, 6th Frontiers in Biomedical Devices Conference, September 26-27, 2011, Irvine, California, USA

42. B.W. Gasser, L.E. Bridges, **S. Kargar**, D.M. Bardot, 2011, "Design of an Ossiointegrated Lower Limb Prosthetic Force Limiting Connection"
ASME Journal of Medical Devices

43. B.W. Gasser, L.E. Bridges, **S. Kargar**, D.M. Bardot, 2011, "Design of an Ossiointegrated Lower Limb Prosthetic Force Limiting Connection"
Proceedings of the 2011 Design of Medical Devices Conference, DMD2011, April 12-14, 2011, Minneapolis, MN, USA

44. **S. Kargar**, D.M. Bardot, 2010, "Uncertainty Analysis, Verification and Validation of a Stress Proceedings of the Concentration in a Cantilever Beam"
COMSOL Conference 2010 October 7-9 2010, Boston, MA, UAS

45. S. Maleki, **S. Kargar**, 2009, "Limits of Elastomeric Bearings Use for Bridges"
Proceedings of the Third International Conference on Modeling, Simulation and Applied Optimization, Sharjah, U.A.E January 20-22, 2009

SCIENTIFIC SKILLS

MRI Research

- MR Physics
- Scientific Communication
- Volunteer and Patient Studies
- Collaboration with Clinicians and Researchers
- Preclinical Protocol Development
- Experience in scanning with GE and Bruker MRI scanner
- Pulse Sequence Programming
- Perfusion Imaging (DCE-MRI)
- Image Reconstruction

Software

- MATLAB, C++/C, Python
- GE EPIC Pulse sequence programming
- Deep Learning (PyTorch)
- Horos/Osirix
- 3D Slicer
- Inkscape
- LaTeX
- ParaVision
- Analyze
- ITK-Snap

PERSONAL SKILLS/INTRESTS

- Outgoing/Excellent Communication
- Great Team Player
- Goal Oriented Personality
- Excellent Ability to Focus/Attention to Detail
- Enjoy Traveling

- Enjoy listening to audiobooks
- Passionate Tennis player. USTA League captain.
- Painting

AWARDS/CERTIFICATIONS

- ABMP Part 1 (MR Science) 2024
- Poster Award: Magna cum Laude Merit award for ISMRM Power Pitch 2024
- Poster award: Best application award, ISMRM Workshop on Data Sampling & Image Reconstruction, Sedona AZ 2016
- ISMRM Travel award, International Society for Magnetic Resonance in Medicine 2017, 2019,2020, 2022
- RSNA Travel Award, Radiological Society of North America 2018
- SMRA Travel Award, Society for Magnetic Resonance Angiography 2015
- Outstanding Graduate Student in Mechanical Engineering, University of Alabama in Huntsville 2011

OTHER EXPERIENCE AND PROFESSIONAL MEMBERSHIPS

- Member/Trainee, International Society for Magnetic Resonance in Medicine (ISMRM) 2014 - Present
- Member/Trainee, Society for Magnetic Resonance Angiography (SMRA) 2015 - 2019
- Member/Trainee, Biomedical Engineering Society (BMES) 2015 - 2019
- Student/Trainee, The Radiological Society of North America (RSNA) 2017 - 2018

SCIENTIFIC ACTIVITIES

- Lead for Open Science Initiative in Perfusion Imaging (OSIPI) Task Force 6.2
- Book Chapter Author (In process). Book Title: "MRI Pulse Sequences made easy". Chapter Title: "Pulse sequence – the most frequently asked technical questions"
- Co-organizer for "Pre-Clinical Imaging Consortium 2024", University of Colorado – Anschutz Medical Campus, Link: **https://medschool.cuanschutz.edu/colorado-cancer-center/education/pic-conference**
- Reviewer for peer review articles in:
  - Magnetic Resonance Materials in Physics, Biology, and Medicine (MAGMA).
  - Journal of Magnetic Resonance Imaging
- Judge for High School/Middle School poster
- American Board of Medical Physics Part I Exam (MRI Science) – taken the exam on Oct 02 2024

TEACHING AND MENTORSHIP EXPERIENCE

- Mayo Graduate School, Rochester, MN
  - Graduate Teaching Assistant (Magnetic Resonance Imaging Systems) 2019
  - Rotation student mentor 2017,2018
- University of Alabama in Huntsville, Huntsville, AL
  - Lab Instructor – Mechanics of Materials/Fluid Mechanics 2010
  - Course instructor - Numerical Method and Computational Engineering 2011
  - Grader - Soil Mechanics (CE372) 2009
  - Grader - Mechanics of Materials (MAE370) 2009
  - Advanced Aerospace Structures and Materials (MAE371) 2009

PATENTS

- Patent Application Title: Systems and methods for controlling breathing, Application #: 16643343
  Inventors: Brent M Berry, Carlos B Mantilla, Obaid Khurram, Soudabeh Kargar, Joseph D Mozingo, Michal T Kucewicz, Erik S Daniel, Gary C Sieck, 2020/8/13
- Patent Application Title: Synthetic Three-Dimensional Magnetic Resonance Imaging, Application#: 16965146
  Inventors: Eric A Borisch, Stephen J Riederer, Roger C Grimm, Soudabeh Kargar, 2021/2/11

REFERENCES

Stephen J. Riederer, Ph.D. (riederer@mayo.edu)
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Houchun Harry Hu, Ph.D. (houchun.hu@cuanschutz.edu)
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Ricardo Otazo, Ph.D. (otazotoj@mskcc.org)