

Rehman Ali, PhD

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EDUCATION

Doctor of Philosophy (PhD), Electrical Engineering Stanford University • Palo Alto, CA	2021
Master of Science (MS), Computational & Mathematical Engineering Stanford University • Palo Alto, CA	2019
Bachelor of Science (BS), Biomedical Engineering Georgia Institute of Technology • Atlanta, GA	2016

POSTDOCTORAL TRAINING

NIH K99/R00 Pathway to Independence Award K99 Phase (Mentored Career Development) University of Rochester Medical Center • Rochester, NY	Jun 2025-Present
Ruth L. Kirschstein Individual National Research Service Award (NRSA) NIH F32 Postdoctoral Fellowship University of Rochester Medical Center • Rochester, NY	Feb 2023-Feb 2025

ACADEMIC & PROFESSIONAL HONORS/AWARDS

FELLOWSHIPS/CAREER DEVELOPMENT AWARDS:

NIH K99/R00 Pathway to Independence Award ▪ The K99 phase provides 2 years of mentored career development towards an independent faculty position ▪ The R00 phase provides 3 years of independent support upon securing a tenure-track faculty position.	Jun 2025-Present
NIH F32 Ruth L. Kirschstein Postdoctoral Individual NRSA ▪ Competitive postdoctoral fellowship supporting mentored research and career development.	Feb 2023-Feb 2025
National Defense Science and Engineering Graduate (NDSEG) Fellowship ▪ Highly competitive graduate fellowship awarded by the U.S. Department of Defense (DoD).	Aug 2017-Aug 2021

HONORS/AWARDS:

IEEE IUS QUASOS Challenge Winner IEEE International Ultrasonics Symposium (IUS) ▪ Awarded to the top performing sound speed estimators in the quantitative sound speed (QUASOS) challenge ▪ Presenting my full-wave inverse solution to sound speed estimation at QUASOS Challenge Winners session.	Oct 2026
GRC Poster Award In-Vivo Ultrasound Imaging • Gordon Research Conference (GRC) ▪ Awarded to the top three scientific poster presentations at the GRC on In-Vivo Ultrasound Imaging	Aug 2026

Cum Laude Poster Award

Feb 2024

Ultrasonic Imaging and Tomography • SPIE Medical Imaging

- Awarded for excellence in the scientific poster presentation in the Ultrasonic Imaging and Tomography track.
- Recognizes high-quality research and effective dissemination within the SPIE Medical Imaging community.

1st Place, Best Postdoctoral Trainee Poster Award

Nov 2023, Nov 2024

Rochester Center for Biomedical Ultrasound (RCBU) Symposium

- Awarded two years in a row for the top-ranked poster presentation by a postdoctoral researcher, recognizing excellence in biomedical ultrasound research and scientific communication.

Steadman Family Postdoctoral Award Finalist

Sep 2023

University of Rochester

- Selected as a finalist for a competitive award recognizing exceptional postdoctoral research excellence, innovation, and potential for scientific impact. Finalists gave a 2-minute presentation to the Steadman family.

Student Travel Award

Oct 2018

IEEE International Ultrasonics Symposium (IUS)

- Competitively awarded to support student participation and presentation at the IEEE IUS
- Based on research merit and academic achievement in the field of medical ultrasonics.

Henry Ford II Scholar Award

May 2015

Biomedical Engineering, Georgia Institute of Technology

- Awarded to the top undergraduate student in each engineering department at the end of their 3rd year of study

President's Undergraduate Research Award (PURA)

2015

Georgia Institute of Technology

- Competitive research grant awarded to undergraduates to support faculty-mentored research projects.
- Recognizes academic excellence, intellectual curiosity, and commitment to undergraduate research.

State Advanced Placement (AP) Scholar Award

Jul 2012

- Awarded annually to the top male and female student in each U.S. state with the highest number of Advanced Placement (AP) exams scoring 3 or higher and highest average score (> 3.5) across all AP exams taken.

University Interscholastic League (UIL) Science State Finalist

May 2011, May 2012

- Recognized as a top competitor advancing to the state-level finals in the UIL Science contest, demonstrating strong knowledge and problem-solving skills in science

INVITED LECTURES/PRESENTATIONS

1. **Math Modeling Seminar: Full-Waveform Inversion for Medical Ultrasound Imaging.** School of Mathematical Sciences, College of Science, Rochester Institute of Technology (RIT), Rochester, NY USA (October 20, 2026) - <https://www.rit.edu/events/math-modeling-seminar-full-waveform-inversion-medical-ultrasound-imaging>
2. **Full-Waveform Inversion for Medical Ultrasound Imaging.** Electrical and Systems Engineering (ESE) "New Voices" seminar series at Washington University in St. Louis, St. Louis, MO USA (May 22, 2026) - <https://happenings.washu.edu/event/ece-seminar-rehman-ali>
3. **Techniques to Overcome Cycle Skipping in Frequency-Domain Full-Waveform Inversion for Ultrasound Tomography.** Intersection of Biomedical Acoustics and Machine Learning Minisymposium -

Conference on Mathematics of Wave Phenomena 2025 - Department of Mathematics, Karlsruhe Institute of Technology, Germany (February 25, 2025)

4. **Frequency-Domain Waveform Inversion for Ultrasound Tomography**. Workshop: Isaac Newton Institute - Rich and Nonlinear Tomography - A Multidisciplinary Approach. Cambridge University, UK (June 23, 2023) - <https://www.youtube.com/watch?v=nDawv0gNL1A>
5. Invited to speak at **University of Illinois Coordinated Science Laboratory (CSL) Student Conference**—Could not attend due to conflict with 2022 SPIE Medical Imaging

PEER-REVIEWED PUBLICATIONS

REVIEW ARTICLES (INVITED):

1. **Ali, Rehman**, Thurston Brevett, Louise Zhuang, Hanna Bendjador, Anthony S. Podkowa, Scott S. Hsieh, Walter Simson, Sergio J. Sanabria, Carl D. Herickhoff, and Jeremy J. Dahl. "Aberration correction in diagnostic ultrasound: A review of the prior field and current directions." *Zeitschrift für Medizinische Physik* 33, no. 3 (2023): 267-291.

ORIGINAL WORK:

1. **Ali, Rehman**, Trevor M. Mitcham, Marvin M. Dooley, Nebojsa Duric, and Jeremy J. Dahl. "Wave-Equation Migration Velocity Analysis for Multistatic Synthetic Aperture Ultrasound." *arXiv preprint arXiv:2604.27428* (2026). <https://github.com/rehmanali1994/WEMVA>
2. Marini, Thomas J., Trevor Mitcham, **Rehman Ali**, Israel Owolabi, Victoria Nketia, Matthew Bender, Gurkirat Kohli, Santiago Mendoza-Ayus, Marissa Lake, Melanie Singh, Alex Klaben, Mohammad Mehrmohammadi, Timothy M. Baran, Deborah Rubens, James Bai, Shehanaz Ellika, Alexander Kessler, Anthony Portonova, Stephen M. Smith, Adam Dykie, Yu T. Zhao, Hossein Raeis, Gaoferi Jin, David Bustamante, Eric Miller, Josephine Buffum, and Nebojsa Duric. "Where no sound wave has gone before: first high-resolution transcranial images of the brain using ultrasound computed tomography." *European Journal of Radiology* (2026): 113193.
3. Mitcham, Trevor, **Rehman Ali**, Melanie Singh, Sarah McConnell, Redi Rahmani, Derrek Schartz, Matthew Bender, Edward Vates, and Neb Duric. "Transcranial ultrasound tomography for brain imaging: Ex vivo results and potential for stroke imaging." *Medical Physics* 52, no. 10 (2025): e18090.
4. **Ali, Rehman**, Gaoferi Jin, Melanie Singh, Trevor Mitcham, and Nebojsa Duric. "3D Frequency-Domain Full Waveform Inversion for Whole-Breast Imaging with a Multi-Row Ring Array." *IEEE Open Journal of Ultrasonics, Ferroelectrics, and Frequency Control* (2025). <https://github.com/rehmanali1994/3D-FWI-MultiRowRingArrayUST>
5. **Ali, Rehman**, Trevor Mitcham, Israel Owolabi, Sarah McConnell, and Nebojsa Duric. "Frequency-differencing strategy to kickstart full-waveform inversion without cycle skipping." *JASA Express Letters* 5, no. 1 (2025). <https://github.com/rehmanali1994/FrequencyDifferencing>
6. Bustamante, David, Yan Yan, Trevor Mitcham, **Rehman Ali**, Brian Marples, Kimberly R. Gergelis, Peter Littrup, Nebojsa Duric, and Mohammad Mehrmohammadi. "Generating and monitoring mild hyperthermia using a ring array ultrasound transducer." *International Journal of Hyperthermia* 41, no. 1 (2024): 2376681.
7. **Ali, Rehman**, Trevor M. Mitcham, Thurston Brevett, Óscar Calderón Agudo, Cristina Durán Martínez, Cuiping Li, Marvin M. Dooley, and Nebojsa Duric. "2-D Slicewise Waveform Inversion of Sound Speed and Acoustic Attenuation for Ring Array Ultrasound Tomography Based on a Block LU Solver." *IEEE transactions on medical imaging* 43, no. 8 (2024): 2988-3000. <https://github.com/rehmanali1994/WaveformInversionUST>

8. **Ali, Rehman**, Nebojsa Duric, and Jeremy J. Dahl. "Optimal transmit apodization for the maximization of lag-one coherence with applications to aberration delay estimation." *Ultrasonics* 132 (2023): 107010.
9. **Ali, Rehman**, Trevor M. Mitcham, Melanie Singh, Marvin M. Dooley, Richard R. Bouchard, Jeremy J. Dahl, and Nebojsa Duric. "Sound speed estimation for distributed aberration correction in laterally varying media." *IEEE transactions on computational imaging* 9 (2023): 367-382.
<https://github.com/rehmanali1994/IMPACT>
10. **Ali, Rehman**, Trevor Mitcham, Leandra Brickson, Wentao Hu, Marvin Dooley, Deborah Rubens, Zeljko Ignjatovic, Nebojsa Duric, and Jeremy Dahl. "Separation of mainlobe and sidelobe contributions to b-mode ultrasound images based on the aperture spectrum." *Journal of Medical Imaging* 9, no. 6 (2022): 067001-067001.
<https://github.com/rehmanali1994/MainlobeSidelobeSeparation>
11. **Ali, Rehman**, and Jeremy Dahl. "Angular spectrum method for curvilinear arrays: Theory and application to Fourier beamforming." *JASA Express Letters* 2, no. 5 (2022).
<https://github.com/rehmanali1994/CurvilinearAngularSpectrumMethod>
12. **Ali, Rehman**, Thurston Brevett, Dongwoon Hyun, Leandra L. Brickson, and Jeremy J. Dahl. "Distributed aberration correction techniques based on tomographic sound speed estimates." *IEEE Transactions on Ultrasonics, Ferroelectrics, and Frequency Control* 69, no. 5 (2022): 1714-1726.
<https://github.com/rehmanali1994/DistributedAberrationCorrection>
13. Telichko, Arsenii V., **Rehman Ali**, Thurston Brevett, Huaijun Wang, Jose G. Vilches-Moure, Sukumar U. Kumar, Ramasamy Paulmurugan, and Jeremy J. Dahl. "Noninvasive estimation of local speed of sound by pulse-echo ultrasound in a rat model of nonalcoholic fatty liver." *Physics in Medicine & Biology* 67, no. 1 (2022): 015007.
14. **Ali, Rehman**, Arsenii V. Telichko, Huaijun Wang, Uday K. Sukumar, Jose G. Vilches-Moure, Ramasamy Paulmurugan, and Jeremy J. Dahl. "Local sound speed estimation for pulse-echo ultrasound in layered media." *IEEE transactions on ultrasonics, ferroelectrics, and frequency control* 69, no. 2 (2021): 500-511.
<https://github.com/rehmanali1994/DixInversion4MedicalUltrasound>
15. **Ali, Rehman**. "Fourier-based synthetic-aperture imaging for arbitrary transmissions by cross-correlation of transmitted and received wave-fields." *Ultrasonic imaging* 43, no. 5 (2021): 282-294.
<https://github.com/rehmanali1994/FourierDomainBeamformer>
16. **Ali, Rehman**, Carl D. Herickhoff, Dongwoon Hyun, Jeremy J. Dahl, and Nick Bottenus. "Extending retrospective encoding for robust recovery of the multistatic data set." *IEEE transactions on ultrasonics, ferroelectrics, and frequency control* 67, no. 5 (2019): 943-956. <https://github.com/nbottenus/REFoCUS>
17. Jakovljevic, Marko, Scott Hsieh, **Rehman Ali**, Gustavo Chau Loo Kung, Dongwoon Hyun, and Jeremy J. Dahl. "Local speed of sound estimation in tissue using pulse-echo ultrasound: Model-based approach." *The Journal of the Acoustical Society of America* 144, no. 1 (2018): 254-266.
18. **Ali, Rehman**, Jeremy Harris, and Bard Ermentrout. "Pattern formation in oscillatory media without lateral inhibition." *Physical Review E* 94, no. 1 (2016): 012412. <https://github.com/rehmanali1994/Wilson-Cowan-Equations>

PATENTS

1. **Ali, R., & Duric, N.** (2024). "Diffraction tomography for sound speed estimation and aberration correction in medical pulse-echo ultrasound imaging based on migration velocity analysis." WO2024091434 (International Application No. PCT/US2023/035656, filed October 22, 2023, and published May 2, 2024). World Intellectual Property Organization. <https://patentscope.wipo.int/>

2. **Ali, R.,** & Duric, N. (2025). "Method, system, and product for overcoming cycle skipping for full-waveform inversion." WO2025030086A1 (International Application No. PCT/US2024/040693, filed August 2, 2024, and published February 6, 2025). World Intellectual Property Organization. <https://patentscope.wipo.int/>

ANNUAL MEETINGS/CONFERENCE PRESENTATIONS AND PROCEEDINGS

1. Klaben, Alex, Melanie Singh, Nebojsa Duric, and **Rehman Ali**. "Using JAX to develop cycle-skipping resistant full-waveform inversion techniques for ultrasound tomography." In *Medical Imaging 2026: Ultrasonic Imaging and Tomography*, vol. 13931, pp. 104-112. SPIE, 2026.
2. Owolabi, Israel, **Rehman Ali**, Trevor Mitcham, Victoria Nketia, Melanie Singh, and Nebojsa Duric. "Least-squares low-frequency extrapolation for full-waveform inversion without cycle skipping." In *Medical Imaging 2026: Ultrasonic Imaging and Tomography*, vol. 13931, pp. 98-103. SPIE, 2026.
3. Nketia, Victoria, Trevor Mitcham, Maria Camila Gonzalez Garcia, **Rehman Ali**, Israel Owolabi, Melanie Singh, and Neb Duric. "Optimizing computational efficiency and image quality in clinical breast ultrasound tomography through data downsampling." In *Medical Imaging 2026: Ultrasonic Imaging and Tomography*, vol. 13931, pp. 118-133. SPIE, 2026.
4. **Ali, Rehman**, Trevor Mitcham, and Nebojsa Duric. "Differentiable reverse-time migration for sound speed estimation and aberration correction in medical pulse-echo ultrasound." In *Medical Imaging 2026: Ultrasonic Imaging and Tomography*, vol. 13931, p. 1393103. SPIE, 2026.
5. **Ali, Rehman**, and Nebojsa Duric. "Target-following Lagrangian approach to sound speed estimation in pulse-echo ultrasound." In *Medical Imaging 2026: Ultrasonic Imaging and Tomography*, vol. 13931, pp. 26-33. SPIE, 2026.
6. **Ali, Rehman**, Trevor Mitcham, and Nebojsa Duric. "Reviving and extending the mid-field phase screen model for distributed aberration correction." In *Medical Imaging 2026: Ultrasonic Imaging and Tomography*, vol. 13931, pp. 368-374. SPIE, 2026.
7. Singh, Melanie, **Rehman Ali**, Trevor Mitcham, Israel Owolabi, Victoria Nketia, Alex Klaben, and Nebojsa Duric. "Assessing the feasibility of brain imaging with ultrasound tomography: in-silico and in-vitro evaluation." In *Medical Imaging 2026: Ultrasonic Imaging and Tomography*, vol. 13931, pp. 15-25. SPIE, 2026.
8. **Ali, Rehman**, and Nebojsa Duric. "Fast Fourier beamforming for arbitrary ultrasound imaging sequences based on ak-space implementation of reverse-time migration." In *Medical Imaging 2026: Ultrasonic Imaging and Tomography*, vol. 13931, pp. 362-367. SPIE, 2026.
<https://github.com/rehmanali1994/FastFourierBeamformers>
9. Marty, Patrick, Christian Boehm, Trevor Mitcham, **Rehman Ali**, Neb Duric, and Andreas Fichtner. "Optimal transport in transcranial ultrasound (Conference Presentation)." In *Medical Imaging 2025: Ultrasonic Imaging and Tomography*, vol. 13412, p. 134120T. SPIE, 2025.
10. **Ali, Rehman**, Trevor Mitcham, and Nebojsa Duric. "Frequency-Differencing Method to Kickstart Waveform Inversion Without Cycle Skipping." In *2024 IEEE Ultrasonics, Ferroelectrics, and Frequency Control Joint Symposium (UFFC-JS)*, pp. 1-4. IEEE, 2024.
11. Marty, Patrick, Trevor Mitcham, **Rehman Ali**, Christian Boehm, Neb Duric, and Andreas Fichtner. "Towards elastic bone characterization in transcranial ultrasound." In *Medical Imaging 2024: Ultrasonic Imaging and Tomography*, vol. 12932, pp. 116-129. SPIE, 2024.
12. **Ali, Rehman**, Trevor Mitcham, and Nebojsa Duric. "A new strategy to overcome cycle skipping: frequency-difference waveform inversion." In *Medical Imaging 2024: Ultrasonic Imaging and Tomography*, vol. 12932, pp. 85-92. SPIE, 2024.

13. **Ali, Rehman**, Feiyu Wang, Trevor Mitcham, and Nebojsa Duric. "Efficient Helmholtz equation solver for frequency domain waveform inversion based on the decomposition into one-way wave equations." In *Medical Imaging 2024: Ultrasonic Imaging and Tomography*, vol. 12932, pp. 262-268. SPIE, 2024. **[Received Ultrasound Imaging and Tomography Cum Laude Poster Award at SPIE Medical Imaging 2024]**
14. Mitcham, Trevor, **Rehman Ali**, Derrek Scharzt, Redi Rahmani, Melanie Singh, Matthew Bender, Edward Vates, and Nebojsa Duric. "Imaging stroke through the skull using ultrasound tomography." In *Medical Imaging 2024: Ultrasonic Imaging and Tomography*, vol. 12932, pp. 107-115. SPIE, 2024.
15. **Ali, Rehman**, Trevor Mitcham, Melanie Singh, Richard Bouchard, Marvin Doyley, Jeremy Dahl, and Nebojsa Duric. "Iterative Sound Speed Tomography for Distributed Aberration Correction." In *2023 IEEE International Ultrasonics Symposium (IUS)*, pp. 1-4. IEEE, 2023.
16. **Ali, Rehman**, Trevor Mitcham, Melanie Singh, Brenna Harris, Madalina Tivarus, and Nebojsa Duric. "Waveform Inversion in Ultrasound Tomography from Homogeneous Starting Models." In *2023 IEEE International Ultrasonics Symposium (IUS)*, pp. 1-4. IEEE, 2023.
17. Mitcham, Trevor, **Rehman Ali**, Derrek Scharzt, Melanie Singh, Matthew Bender, and Neb Duric. "Feasibility of imaging ischemic stroke through the skull using ultrasound tomography." In *2023 IEEE International Ultrasonics Symposium (IUS)*, pp. 1-3. IEEE, 2023.
18. **Ali, Rehman**, Trevor Mitcham, Melanie Singh, Richard Bouchard, Jeremy Dahl, Marvin Doyley, and Nebojsa Duric. "Distributed aberration correction in handheld ultrasound based on tomographic estimates of the speed of sound." In *Medical Imaging 2023: Ultrasonic Imaging and Tomography*, vol. 12470, pp. 25-35. SPIE, 2023.
19. **Ali, Rehman**, Trevor Mitcham, and Nebojsa Duric. "Impact of starting model on waveform inversion in ultrasound tomography." In *Medical Imaging 2023: Ultrasonic Imaging and Tomography*, vol. 12470, pp. 89-98. SPIE, 2023.
20. Brevett, Thurston, Sergio J. Sanabria, **Rehman Ali**, and Jeremy Dahl. "Speed of sound estimation at multiple angles from common midpoint gathers of non-beamformed data." In *2022 IEEE International Ultrasonics Symposium (IUS)*, pp. 1-4. IEEE, 2022.
21. Sanabria, Sergio J., Thurston Brevett, **Rehman Ali**, Arsenii Telichko, and Jeremy Dahl. "Direct speed of sound reconstruction from full-synthetic aperture data with dual regularization." In *2022 IEEE International Ultrasonics Symposium (IUS)*, pp. 1-4. IEEE, 2022.
22. **Ali, Rehman**. "Open-source full-waveform ultrasound computed tomography based on the angular spectrum method using linear arrays." In *Medical Imaging 2022: Ultrasonic Imaging and Tomography*, vol. 12038, pp. 187-205. SPIE, 2022. <https://github.com/rehmanali1994/FullWaveformInversionUSCT>
23. **Ali, Rehman**, Joseph Jennings, and Jeremy J. Dahl. "Medical pulse-echo ultrasound imaging based on the cross-correlation of transmitted and backpropagated-receive wavefields." In *2020 IEEE International Ultrasonics Symposium (IUS)*, pp. 1-4. IEEE, 2020.
24. **Ali, Rehman**, Dongwoon Hyun, and Jeremy J. Dahl. "Application of common midpoint gathers to medical pulse-echo ultrasound for optimal coherence and improved sound speed estimation in layered media." In *2020 IEEE International Ultrasonics Symposium (IUS)*, pp. 1-4. IEEE, 2020.
25. **Ali, Rehman**, Sharil Maredia, Arsenii Telichko, Huaijun Wang, Ramasamy Paulmurugan, Jose Vilches-Moure, and Jeremy Dahl. "Sound speed estimation in layered media using the angular coherence of plane waves." In *Medical Imaging 2020: Ultrasonic Imaging and Tomography*, vol. 11319, pp. 81-90. SPIE, 2020.
26. **Ali, Rehman**, Jeremy J. Dahl, and Nick Bottenus. "Iterative retrospective recovery of full synthetic aperture data from focused transmissions." In *2019 IEEE International Ultrasonics Symposium (IUS)*, pp. 1005-1008. IEEE, 2019.

27. **Ali, Rehman**, and Jeremy J. Dahl. "Travel-time tomography for local sound speed reconstruction using average sound speeds." In *2019 IEEE International Ultrasonics Symposium (IUS)*, pp. 2007-2010. IEEE, 2019.
28. **Ali, Rehman**, Scott Hsieh, and Jeremy Dahl. "Open-source Gauss-Newton-based methods for refraction-corrected ultrasound computed tomography." In *Medical Imaging 2019: Ultrasonic Imaging and Tomography*, vol. 10955, pp. 39-52. SPIE, 2019. <https://github.com/rehmanali1994/refractionCorrectedUSCT.github.io>
29. **Ali, Rehman**, Jeremy J. Dahl, and Nick Bottenus. "Regularized inversion method for frequency-domain recovery of the full synthetic aperture dataset from focused transmissions." In *2018 IEEE International Ultrasonics Symposium (IUS)*, pp. 1-9. IEEE, 2018.

GRANTS, CONTRACTS, AND OTHER FUNDING

ACTIVE GRANTS AND CONTRACTS:

1. NIH/NIBIB (K99-EB037080) 07/15/2025 – 06/30/2027

Title: *Accurate High-Resolution Tissue Characterization for Breast Cancer Screening Using Transmission and Reflection Ultrasound Tomography.*

Project Narrative: The proposed research under this Pathway to Independence Award (K99/R00) aims to expand the capability and performance of ultrasound tomography as an imaging modality that enables greater sensitivity and specificity for breast cancer screening without using compression or ionizing radiation. To achieve this goal, we will improve the modeling and inversion techniques currently used in ultrasound tomography to better accommodate high-frequency signals, thereby increasing the achievable imaging resolution and accuracy of ultrasound tomography. Successful completion of this project will improve fundamental understandings of acoustic models and inversion techniques for reflection and transmission ultrasound and enable the quantitative imaging of tissue properties at higher spatial resolution for the early detection and diagnosis of cancer.

Amount: \$249,998

Role: PI

PREVIOUSLY FUNDED GRANTS AND CONTRACTS:

1. NIH/NIBIB (F32-EB034589) 03/01/2023 – 02/28/2025

Title: *Multiparametric Tissue Characterization for Breast Cancer Screening Using Transmission and Reflection Ultrasound Tomography.*

Project Narrative: The proposed research under this Ruth L. Kirschstein Postdoctoral (F32) Individual National Research Service Award (NRSA) aims to expand the capability and performance of ultrasound tomography as a non-ionizing radiation imaging modality that enables greater sensitivity and specificity for breast cancer screening. To achieve this goal, we plan to incorporate both reflection and transmission information in our modeling and inversion approaches to improve and expand the tissue characterization capabilities of ultrasound tomography. Successful completion of this project will improve fundamental understandings of acoustic models and inversion techniques for reflection and transmission ultrasound and further enable quantitative and spatially resolved imaging of tissue properties for the early detection and diagnosis of cancer.

Amount: \$143,364

Role: PI

TEACHING**ECE 485: Inverse Problems in Imaging**

Spring 2024, Spring 2025

University of Rochester • Rochester, NY

- I developed the complete curriculum and course materials for this course at the University of Rochester

CEE 262: Imaging with Incomplete Information

Fall 2019

Stanford University • Palo Alto, CA

BIOE 220: Intro to Imaging & Image-based Human Anatomy

Winter 2017

Stanford University • Palo Alto, CA

MENTORSHIP**HIGH SCHOOL STUDENTS:**

Izyan Maredia	2024
Mathew Atalla	2022-2023
Mark Atalla	2022-2023
Sharil Maredia	2019

UNDERGRADUATE STUDENTS:

Alex Klaben	2023-present
Joselyn Chen	2024-2025
Christian Voloshen	2023-2024
Feiyu Wang	2023-2024
Severin Ihnat	2022-2024

GRADUATE STUDENTS:

1. Israel Owolabi	2023-present
2. Victoria Nketia	2023-present
3. Gaoferi Jin	2023-present
4. Hossein Raeis	2024-present
5. Melanie Singh	2022-present

SERVICE**PROFESSIONAL:**

Session Chair—Ultrasound Tomography Session, SPIE Medical Imaging	2023, 2024, 2026
Session Chair—IEEE International Ultrasonics Symposium (IUS)	2023

COMMUNITY BOARDS / PLANNING COMMITTEES / OUTREACH:

Stanford University Radiological Science Laboratory (RSL) Retreat Planning Committee	2018
Mentor for Summer REU Program at University of Rochester: Imaging in Medicine and Biology	Summer 2024
University of Rochester Schwartz Discover Grant Reviewer	Spring 2026

SCHOLARLY PEER REVIEW:

2022-present

Ultrasonics—Published by Elsevier

Medical Physics—American Association of Physicists in Medicine

IEEE Transactions on Medical Imaging (TMI)

- Distinguished Reviewer Bronze Level 2023-2024

IEEE Transactions on Computational Imaging (TCI)
IEEE Transactions on Ultrasonics Ferroelectrics & Frequency Control
Journal of the Acoustical Society of America
Nature—Communications Medicine

MAJOR PROFESSIONAL SOCIETIES

SPIE: International Society for Optics and Photonics
IEEE: Institute of Electrical and Electronics Engineers

2019-present
2018-present
