EMILY (EM) TRIOLO

EMILY.THETRIOLOS.COM

EDUCATION

Ph.D. **University of Washington, Mechanical Engineering** Expected June 2024

M.Eng. **Stevens Institute of Technology, Mechanical Engineering** May 2021
GPA: 4.0, Masters Concentration: Medical Device Engineering

B.S. **The College of New Jersey, Biomedical Engineering** May 2019
GPA: 3.85, Fred O. Armstrong Scholar- Highest GPA in Graduating Class
Research track, honors program student

HONORS AND AWARDS

Robert Crooks Stanley Fellowship 2020-21, 2021-22
SB3C Diversity Participation Award 2021,22
NSF GRFP Honorable Mention 2021
Stevens Institute of Technology Provost Fellowship 2019-2021
Fred O. Armstrong Scholar- Biomedical Engineering Class of 2019
TCNJ Academic Scholarship 2015-2019
Conrad and Melita Johnson Scholarship Endowment Fund 2018
Tau Beta Pi Scholarship 2018
NASA New Jersey Space Grant Consortium Research Stipend Summer 2018
Freshman Engineering Fund Scholarship 2015

RESEARCH EXPERIENCE

Ph.D. Student Researcher, KurtLab Aug. 2019-Present
University of Washington Jan. 2022-Present
Stevens Institute of Technology Aug. 2019-Dec. 2021

Ph.D. student researcher in Dr. Mehmet Kurt's laboratory developing a mechanical actuator and viscoelastic inversion algorithm for performing MR elastography of the brain at 7T and 3T MRI, as well as other MR compatible devices and MRI post-processing procedures to model the human brain and develop diagnostic techniques for neurological disorders. Other responsibilities include training in MR Imaging protocols and post-processing, operating 3T Siemens Prisma MRI scanner for human and phantom studies, writing IRBs for human imaging studies, developing MR imaging protocols, maintenance, training, and printing jobs for 3-D printers, and maintaining data backups. Transferred with Dr. Kurt from Stevens Institute of Technology to the University of Washington in Jan 2022 to continue work in the same lab.

Student Research Volunteer, BMEII, Mount Sinai Hospital March 2021-Present

Student Research Volunteer in Dr. Priti Balchandani's laboratory assisting with 7T MRI clinical research involving healthy aging, mild cognitive impairment, and Alzheimer's Disease. Responsibilities include installation and validation of MR Elastography actuator and custom sequences, acting as research assistant during human MRI scans at 3T and 7T, and running solo phantom studies at 3T and 7T.

Undergraduate Student Researcher, The College of New Jersey 2017-2019

Undergraduate student researcher in Dr. Brett BuSha's bioinstrumentation laboratory developing and performing human testing for a powered, 3-D printed orthotic exoskeleton for the human hand to augment grip and pinch strength.

WORK EXPERIENCE

Peer Tutor, *The College of New Jersey, Tutoring Center* 2016-2019

Tutored individuals or groups in mechanics, biomechanics, physiological systems, circuit analysis, physics, calculus, and computer science

Laboratory Supervisor and Assistant, *The College of New Jersey, School of Engineering* 2017-2019

Shift supervisor for engineering building labs after-hours

Responsibilities include supervising students using labs, other student workers on shift, cleaning and closing labs and classrooms when building closes, assisting machinist and 3D printing lab

Team Engineering, *The College of New Jersey, School of Engineering* 2016-2019
Gives tours of the engineering facilities to prospective students, parents, and alumni
Talks to prospective students and their parents during open houses and accepted students days

TEACHING EXPERIENCE

University of Washington, Seattle, WA

Teaching Assistant, Applications of Dynamics in Engineering Spring Quarter 2022
I put together lecture slides for various topics of dynamics and mentored students about their quarter-long applied dynamics projects. Topics ranged from shoe biomechanics to boat propellor dynamics.

Teaching Assistant, Introduction to Senior Capstone, Mechanical Engineering Fall Quarter 2023
I taught two hands-on studio sessions and one independent work session per week to teach 4th year engineering students about the engineering design process as it related to a quarter-long capstone project. I also helped run the yearly Capstone Fair for the senior engineering students to pick their year-long design projects.

Guest Lectures & Invited Presentations

Intro to Biomechanics, University of Notre Dame October 2023
I was invited to speak as a guest lecturer by Dr. Maria Holland (Assistant Professor, University of Notre Dame) to present my research on MRI and applications in tissue mechanics and viscoelasticity. This lecture was a 50-minute seminar titled "Development of Advanced MR Elastography Techniques for Biomechanical Assessment of Neurodegeneration".

Biomechanical Imaging: Principles and Methods, University of Washington November 2023
I was invited to teach a class and give a demonstration about how to read and analyze MR Elastography data. The lecture and demonstration were 1.5 hours and was titled "MR Elastography and NeuroImage Processing". The presentation detailed how MRE works as a sequence, what MRI scanners output, different MRI data formats, how the steps for processing an MRE dataset, noise metrics, segmentation, co-registration, and masking in neuroimaging. This lecture included four demos: processing an MRE dataset, calculating signal-to-noise, using FreeSurfer for segmentation, and using SPM for co-registration of different imaging types.

PUBLICATIONS

Journal Papers

[J1] **E. Triolo**, O. Khegai, T. Lam, M. McGarry, J. Veraart, A. Alipour, P. Balchandani, M. Kurt. "Understanding the Effect of Resolution and Signal-to-Noise Ratio on Brain Mechanics Measurements Through 7T MR Elastography," *Physics in Medicine and Biology, Major Revisions*

[J2] W. Meinhold, E. Ozkaya, D. Petti, V. Rice, **E. Triolo**, F. Rezayaraghi, P. Kennedy, L. Fleysher, A. Hu, J. Ueda, M. Kurt. "Towards Image Guided Magnetic Resonance Elastography via Active Driver Positioning Robot," in *IEEE Transactions on Biomedical Engineering*, 69(11), 2022. doi: 10.1109/TBME.2022.3168494.

[J3] **Emily Triolo**, Oleksandr Khegai, Efe Ozkaya, Nicholas Rossi, Akbar Alipour, Lazar Fleysher, Priti Balchandani, Mehmet Kurt. "Design, Construction, and Implementation of an MR Elastography Actuator" *Current Protocols*, 2(3), 2022. https://doi.org/10.1002/cpz1.379

[J4] **Emily R. Triolo**, Brett F. BuSha "Design and Experimental Testing of a Force-Augmenting Exoskeleton for the Human Hand" *Journal of NeuroEngineering and Rehabilitation*, 19(23), 2022. https://doi.org/10.1186/s12984-022-00997-6

[J5] E. Ozkaya, **E. Triolo**, F. Rezayaraghi, J. Abderezaei, W. Meinhold, K. Hong, A. Alipour, P. Kennedy, L. Fleysher, J. Ueda, P. Balchandani, M. Eriten, C. Johnson, Y. Yang, and M. Kurt. "Brain-Mimicking Phantom for Biomechanical Validation of Motion Sensitive MR Imaging Techniques" *Journal of the Mechanical Behavior of Biomedical Materials,* Volume 122, 2021, 104680.

Conference Papers & Abstracts

[C1] **E. Triolo**, M. Langan, O. Khegai, S. Binder, T. Hedden, P. Balchandani, M. Kurt, "Cross-Correlation of Biomechanical, Connectomic, and Pathelogic Markers in Neurodegeneration at 7T MRI," *SB3C 2024*, June 11-14 2024, Lake Geneva, WI, USA. *Submitted to PhD Paper Competition*

[C2] **E. Triolo**, M. Langan, O. Khegai, S. Binder, T. Hedden, P. Balchandani, M. Kurt, "A Multi-Modal Biomechanical Imaging and Analysis Framework for Co-Correlation of 7T MR Elastography, 7T DTI, and Amyloid Deposition," *2024 ISMRM & ISMRT Annual Meeting & Exhibition,* May 4-9 2024, Singapore. *Power Pitch*

[C3] **E. Triolo**, O. Khegai, A. Frankini, M. McGarry, P. Balchandani, M. Kurt, "Determining the Relationship between DTI and MR Elastography Metrics in Highly Anisotropic White Matter Structures at 7T," *2024 ISMRM & ISMRT Annual Meeting & Exhibition,* May 4-9 2024, Singapore. *Digital Poster*

[C4] C. Neher, **E. Triolo**, M. Kurt, "Regional Correlation of Stiffness and Perfusion in the Human Brain at 7T MRI through MR Elastography and Arterial Spin Labeling Techniques," *2024 ISMRM & ISMRT Annual Meeting & Exhibition,* May 4-9 2024, Singapore. *Digital Poster*

[C5] C. Neher, K. Green, **E. Triolo**, M. Kurt, "Voxelwise Correlation of Magnetic Resonance Elastography and Arterial Spin Labeled Imaging Signals in the Human Brain," *Biomedical Engineering Society (BMES) Annual Meeting 2023,* October 11-14, Seattle, WA, USA. *Podium Presentation*

[C6] **E. Triolo**, O. Khegai, A. Alipour, P. Balchandani, M. Kurt, "Multifrequency Magnetic Resonance Elastography (MRE) of the Human Brain at 7T," *Biomedical Engineering Society (BMES) Annual Meeting 2023,* October 11-14, Seattle, WA, USA. *Podium Presentation*

[C7] **E. R. Triolo**, M. Langan, O. Khegai, A. Alipour, C. Ferreira-Atuesta, A. Pionteck, J. Sutkowsky, T. Hedden, P. Balchandani, and M. Kurt, "A Biomechanical Analysis Framework for Co-Correlation of 7T MR Elastography Measures and Amyloid Beta Deposition," *Proceedings of the Joint Annual Meeting ISMRM-ISMRT, 2023,* 2023, Digital Poster

[C8] **E. Triolo**, M. Eritrean, C. Johnson, M. Kurt, "Utilizing MR Elastography to Visualize Higher Harmonic Components of Wave Propagation in Phantoms with Interfaces", 2023 *ISMRM & ISMRT Annual Meeting & Exhibition,* June 03-08 2023, Toronto, ON, Canada. *Digital Poster*

[C9] Mackenzie Langan , **Em Rose Triolo**, Oleksandr Khegai, Carolina Ferreira-Atuesta, Jonathan Sutkowski, Trey Hedden, Mehmet Kurt and Priti Balchandani, "Identifying multimodal imaging biomarkers: a framework exploring association of β-Amyloid Accumulation and Microstructural integrity at 7T", *2023 ISMRM & ISMRT Annual Meeting & Exhibition,* June 03-08 2023, Toronto, ON, Canada. *Digital Poster*

[C10] **E. Triolo**, O. Khegai, A. Alipour, T. Hedden, P. Balchandani, M. Kurt, "High Resolution MR Elastography of the Human Brain: Technical Development And Applications In Aging And Alzheimer's Disease," *11th Annual BioMedical Engineering and Imaging Institute Symposium*, 2023, April 20-21, NYC, New York, USA, *Poster and Innovation Station Exhibit*

[C11] **E. R. Triolo**, O. Khegai, A. Alipour, T. Hedden, P. Balchandani, and M. Kurt, "High Resolution MR Elastography of the Human Brain: Technical Development and Applications in Aging and Alzheimer's Disease," *Proceedings of SB3C,* 2023, *Podium Presentation*

[C12] **E. R. Triolo**, O. Khegai, J. Veraart, A. Alipour, P. Balchandani, and M. Kurt, "How Signal-To-Noise Ratio Impacts the Apparent Stiffness Of Brain Tissue In MR Elastography At 7T," *Proceedings of SB3C,* 2022, Poster

[C13] **E.R. Triolo**[†], O. Khegai[†], J. Veraart, A. Alipour, T. Hedden, M. Kurt*, P. Balchandani*, "Parameter Optimization for High-Resolution MR Elastography of the Human Brain at 7T," *Proceedings of the Joint Annual Meeting ISMRM-ESMRMB,* 2022, *ePoster & MRE Study Group Invited Presentation* ([†]co-first author, *co-last author)

[C14] **E.R. Triolo**, A. Alipour, O. Khegai, P. Balchandani, and M. Kurt, "Multifrequency Magnetic Resonance Elastography (MRE) at 7T," *Proceedings of the 10th Annual BioMedical Engineering and Imaging Institute Symposium,* 2022, Poster

[C15] **E. R. Triolo**, O. Khegai, A. Alipour, P. Kennedy, P. Balchandani, and M. Kurt, "Validation and Testing of 7T MR elastography sequence and stiffness reconstruction," *Proceedings of BMES Annual Meeting,* 2021, Virtual Poster

[C16] **E. Triolo**, A. Pionteck, A. Alipour, O. Khegai, P. Kennedy, P. Balchandani, and M. Kurt. "Development and Validation of an Ultra-High Field Compatible MR Elastography Actuator", *Proceedings of SB3C,* 2021, Virtual Podium Presentation

[C17] E. Ozkaya, W. Meinhold, D. Petti, **E. Triolo**, P. Kennedy, L. Fleysher, J. Ueda, M. Kurt, "Parallel Stage Mechanism Image Guided and Targeted MR Elastography", Summer Biomechanics, Bioengineering, and Biotransport Conference (SB3C), June 14-18th 2021, Virtual.

[C18] **E. Triolo**, T. Detroux, J. Abderezaei, Y. Yang, M. Kurt, "Nonlinear Dynamics of a Brain-Mimicking Phantom Under MR Imaging", Biomedical Engineering Society (BMES) Annual Meeting, OCT 14-17th 2020, Virtual

[C19] T. Detroux and **E. Triolo** and J. Abderezaei and M. Kurt, "Numerical and experimental investigation of the nonlinear dynamics in the human brain", International Mechanical Engineering Congress and Exposition, November 16-19 2020, Virtual, Conference Proceedings

[C20] E. Ozkaya, V. Rice, N. Rossi, J. Abderezaei, **E. Triolo**, L. Fleysher, P. Kennedy, Y. Yang, M. Kurt "A Novel MRI Phantom Test Setup For Validation of Mechanical Imaging Techniques via Tissue Mimicking Phantoms", *Summer Biomechanics, Bioengineering, and Biotransport Conference (SB3C)*, July 17-20th 2020, Virtual

[C21] **E.R. Triolo**[†], E. Ozkaya[†], K. Hong, L. Fleysher, P. Kennedy, Y. Yang, and M. Kurt. "A novel MRI setup for validation of Amplified MRI via Intrinsic actuation of tissue-mimicking phantoms," *Proceedings of BioMedical Engineering and Imaging Institute Conference*, 2020. ([†]co-first)

[C22] **E.R. Triolo**, M.H. Stella and B.F. BuSha, "A force augmenting exoskeleton for the human hand designed for pinching and grasping," *Proceedings of Engineering in Medicine and Biology Conference*, 2018.

PROFESSIONAL AFFILIATIONS

ISTAART, *Student Member*, 2024
ISMRM, *Trainee Member***,** 2021-Present
Tau Beta Pi, *Member and Chapter President (2018), New Jersey Zeta*, 2017-Present
IEEE and EMB, *Student Member* 2015-Present
BMES, Student Member, 2015-2016, 2021-Present

SERVICE & LGBTQ+ OUTREACH

KurtLab.com/Pride Administrator
[Funding List Organizer, PRIDE Reviewer], 2021-present
[SB3C LGBTQ+ Social, Assistant Organizer], SB3C Annual Meeting 2022, 2023

Thanksgiving Canned Food Drive Organizer
[Organizer- Chapter President], [New Jersey Zeta Tau Beta Pi], 2018

GLOW (Gay, Lesbian, Or Whatever) Club President
[Club President], [Biotechnology High School], 2014-15