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Table of Contents

A. Education and Employment Information	2
A1. Education	2
A2. Academic Experience	2
B. Scholarship and Creative Activity	3
B1. Grant and Contract Support	3
B2. Publications	5
B3. Professional Meetings, Symposia, and Conferences	10
C. Teaching and Advising	15
C1. Instructional Summary	15
C2. Student and Participant Evaluations	15
C3. Advising	16
D. Service	18
D1. University Service	18
D2. Professional Service	18
E. Honors, Awards and Media Reports	21

A. Education and Employment Information

A1. Education

- 09/2016 **Ph.D.**, Structural Engineering, University of California, San Diego
Dissertation: “*Non-destructive and Semi-destructive Methods for Thermal Stress Measurement in Continuous Welded Rails.*”
Faculty Advisor: *Prof. Francesco Lanza di Scalea*
- 12/2010 **M.S.**, Civil Engineering, University of Pittsburgh
Thesis: “*Sensing Technology for Damage Assessment of Sign Support Structures.*”
Faculty Advisor: *Prof. Piervincenzo Rizzo*
- 06/2008 **B.S.**, Mechanical Engineering, Beihang University, Beijing, China
Focus: *Mechanical systems, Robotics, Ultrasound*

A2. Academic Experience

- 08/2018-present **Assistant Professor**, Civil & Environmental Engineering, University of Utah
- 06/2018 **Visiting scholar**, Earth & Environmental Sciences, Los Alamos National Laboratory
- 10/2017-07/2018 **Postdoctoral research associate**, Civil & Environmental Engineering,
University of Illinois at Urbana-Champaign
- 10/2016-09/2017 **Postdoctoral researcher**, Structural Engineering, University of California, San Diego

B. Scholarship and Creative Activity

B1. Grant and Contract Support

As of February 2024 – My research at the University of Utah has been funded by US Department of Energy, US Department of Transportation, US Department of Agriculture, and other agencies with an accumulated *total project amount of \$2,634,552*.

Note: all numbers reflect the cash from external sponsors, and cost-shares are excluded.

Summary				\$2,634,552	\$1,573,747
Sponsor	Title	Role	Period	Total	Zhu's Credit
Sandia National Laboratories	Metamaterial-enhanced roton-like zero-group-velocity ultrasound for high-quality through-wall power transmission	Co-PI	10/2023-	\$74,996	\$24,757
			12/2024		
National Academies of Sciences, Engineering & Medicine	Local resonance-based NDE technique for rail flaw detection	Solo PI	10/2023-	\$100,000	\$100,000
			12/2024		
Federal Railroad Administration	Real-time railhead transverse defect characterization and physics-based remaining life prediction	Consultant	07/2022-	\$15,000	\$15,000
			06/2024		
Utah Department of Transportation	Utilizing LiDAR to Detect Pedestrian Movements	PI	08/2022-	\$220,000	\$220,000
			09/2024		
US Department of Transportation	Connected vehicle winter safety improvement with infrared thermography technology	Solo PI	08/2022–	\$40,000	\$40,000
			09/2024		
Utah Department of Transportation	Connected vehicle winter safety improvement with infrared thermography technology	PI	08/2022-	\$50,000	\$50,000
			09/2024		
US Department of Energy	Innovative methods for interrogation of DSC internal conditions	Co-PI & Utah PI	10/2021–	\$800,000	\$298,463
			09/2024		

US Department of Transportation	The feasibility of promoting local rail vibrations using EMI method	Solo PI	08/2021–	\$40,000	\$40,000
			07/2022		
Utah Department of Transportation	UDOT brine tank condition assessment	Lead PI	08/2021–	\$50,000	\$50,000
			02/2023		
Federal Railroad Administration	Rail neutral temperature estimation using local rail vibration measurements and machine learning	Co-PI & Utah PI	09/2021–	\$209,377	\$89,431
			03/2024		
Federal Transit Administration	Polarized infrared and optical imaging system for transit infrastructure condition assessment	Utah PI & Tech Lead	09/2021–	\$338,115	\$172,155
			02/2024		
USDA Wood Innovation program	BRB braced frames for seismically resilient mass timber buildings	Co-PI	09/2020–	\$250,000	\$104,073
			09/2023		
American Society for Nondestructive Testing	Development of a course module in machine learning for nondestructive testing at the University of Utah	Solo PI	09/2020–	\$9,916	\$9,916
			08/2021		
Federal Railroad Administration	High-speed rail inspection exploiting anomaly detection data processing approach	Solo PI	07/2020–	\$179,948	\$179,948
			10/2021		
Federal Highway Administration	Roadway ice/snow detection using novel infrared thermography technology	Lead PI	06/2020–	\$137,359	\$137,359
			05/2022		
Association of American Railroads	Polarized infrared thermography for rail defect detection	Solo PI	10/2019–	\$19,841	\$19,841
			12/2019		
National Academies of Sciences, Engineering & Medicine	Vibration-based longitudinal rail stress estimation exploiting contactless measurement and machine learning	Co-PI & Utah PI	08/2019–	\$100,000	\$22,804
			10/2020		

B2. Publications

As of February 2024 – *Journal articles: 24; Conference proceedings: 42; Technical report: 4; Citations: 774; h-index: 15; i10-index: 18.* Underline indicate mentored student(s) at the University of Utah, and * indicates corresponding author.

B2.0 Journal Manuscript Under Review

1. Wu, Y., Zhang, P., Zhang, K., Cui, R., **Zhu, X.*** “Local resonances in free and continuous welded rails,” *Ultrasonics*, submitted.
2. Zhang, K., Wu, Y., Cui, R., **Zhu, X.*** “Influence of boundary conditions and uniaxial loading on local resonances,” *Ultrasonics*, submitted.
3. Zhou, X., Li, Q., Cui, R., **Zhu, X.** “Bridge acceleration data denoising based on long short term memory,” *Structural Control and Health Monitoring*, submitted.
4. Zhou, X., Li, Q., Cui, R., **Zhu, X.** “Time-frequency decomposition of nonlinear responses of structures under seismic excitations based on deep neural network,” *Computer-Aided Civil and Infrastructure Engineering*, submitted.
5. Cui, R., Wei, C., Zhang, K., Wu, Y., Zhu, X. “Signal reconstruction with infrared thermographic data in the application of rail defect detection,” *Journal of Construction and Building Materials*, submitted.
6. Cui, R., Wei, C., Wu, Y., Zhang, K., Zhu, X. “Natural rail fracture defect calibration using infrared thermography and edge detection,” *Journal of Rail and Rapid Transit*, under review.
7. Wu, Y., Zhu, X.* “High-speed rail defect detection using deep autoencoder,” *NDT&E International*, under review.
8. Ramezanzpour Kami, M., Wu, Y., Zhu, X.* “Crack detection in railroad timber ties using dual-spectrum images and YOLOv8,” *Transportation Research Record*, under revision.
9. Zhang, P., Liu, Y., Wu, Y., Zhang, K., Chen, F., Chen, Y., Wang, P., Zhu, X.* “Maxon-like ultrasound in elastic metabeam,” *Applied Physics Letters Materials*, invited paper, under revision.

B2.1 Refereed Journal Publications

1. Atreya, N., Wang, P., Zhu, X.* (2023) “Mechanical property characterization of engineered wood using guided waves and genetic algorithm,” *Sensors*, 23(22), 9184; <https://doi.org/10.3390/s23229184>.
2. He, X., Zhu, X.* (2023) “Two-dimensional acoustic emission source localization on a Laminated Veneer Lumber plate structure by machine learning,” *Structural Health Monitoring*, <https://doi.org/10.1177/14759217231202544>.
3. Wu, Y., Zhang, P., Zhang, K., Zhu, X.*, Popovics, J.S. (2023) “Dynamic behavior of a zero-group velocity guided mode in rail structures,” *Journal of Acoustical Society of America Express Letters*, Vol. 3, Issue 10, <https://doi.org/10.1121/10.0021186>.
4. Huang, C., Wu, Y., He, X., Dersch, M., Zhu, X., Popovics, J.S. (2023) “A review of non-destructive evaluation techniques for rail thermal stress and neutral temperature measurement: Physical phenomena and performance assessment,” *NDT&E International*, p. 102832,

<https://doi.org/10.1016/j.ndteint.2023.102832>.

5. He, X., Wu, Y., Zhang, K., Zhu, X.*, Yang, X. (2023) "Roadway snow estimation using dual-spectrum camera images and computer vision," *Transportation Research Record*, Vol. 2677, Issue 10, <https://doi.org/10.1177/03611981231160544>.
6. Wu, Y., Zhu, X.* (2023) "Rail defect detection using ultrasonic A-scan data and deep autoencoder," *Transportation Research Record*, <https://doi.org/10.1177/03611981221150923>.
7. Zhang, K., Cui, R., Wu, Y., Lin Zhang, Zhu, X.* (2023) "Extraction and selective promotion of zero-group velocity and cutoff frequency resonances in bi-dimensional waveguides using the electromechanical impedance method," *Ultrasonics*, 106937. <https://doi.org/10.1016/j.ultras.2023.106937>.
8. Wu, Y., Cui, R., Zhang, K., Zhu, X.*, Popovics, J.S. (2022) "On the Existence of Zero-Group Velocity Modes in Free Rails: Modeling and Experiments," *NDT&E International*, 132, p.102727. <https://doi.org/10.1016/j.ndteint.2022.102727>.
9. Zhou, Z., Li, J., Xia, W., Zhu, X., Sun, T., Cao, C., & Zhang, L. (2020). "Enhanced piezoelectric and acoustic performances of poly (vinylidene fluoride-trifluoroethylene) films for hydroacoustic applications," *Physical Chemistry Chemical Physics*, 22(10).
10. Tarokh, A., Makhnenko, R.Y., Kim, K., Zhu, X., Popovics, J. S., Segvic, B., Sweet, D. E.(2020). "Influence of CO2 injection on the poromechanical response of Berea sandstone," *International Journal of Greenhouse Gas Control*, 95.
11. Hu, H., Zhu, X., Zhang, L., Li, X., Sternini, S., Lanza di Scalea, F., Xu, S. (2018). "Stretchable ultrasonic transducers for three-dimensional imaging on complex surfaces," *Science Advances*, 4 (3), aar3979.
12. Lanza di Scalea, F., Zhu, X., Sternini, S., Capriotti, M., Liang, A., Mariani, S. (2018) "Passive extraction of dynamics transfer function from ambient excitations: applications to high-speed rail inspection," *Journal of Nondestructive Evaluation, Diagnostics and Prognostics of Engineering Systems, ASME*, 1(1), 011005.
13. Mariani, S., Nguyen, T. V., Zhu, X., Lanza di Scalea, F. (2017) "Field test performance of non-contact ultrasonic rail inspection system," *J. Transp. Eng. ASCE*, Part A: Systems, Vol.143, 5. DOI: <http://dx.doi.org/10.1061/JTEPBS.0000026>.
14. Zhu, X., Lanza di Scalea, F. (2017) "Thermal stress measurement in continuous welded rails using the hole-drilling method," *Experimental Mechanics*, Vol. 57, 1, pp 165-178. DOI: 10.1007/s11340-016-0204-8.
15. Zhu, X., Lanza di Scalea, F. (2016) "Sensitivity to axial stress of electro-mechanical impedance measurements," *Experimental Mechanics*, Vol. 56, 9, pp 1599–1610. DOI:10.1007/s11340-016-0198-2.
16. Kijanka, P., Packo, P., Zhu, X., Staszewski, W., Lanza di Scalea, F. (2015) "Three-dimensional temperature effect modelling of piezoceramic transducers used for Lamb wave based damage detection," *Smart Materials and Structures*, Vol. 24, 6, 0605005. DOI: 10.1088/0964-1726/24/6/065005.
17. Tippmann, J. D., Zhu, X., Lanza di Scalea, F. (2015) "Application of damage detection methods using passive reconstruction of impulse response functions," *Philos Trans A Math Phys Eng Sci.* , 373, 2035. DOI: 10.1098/rsta.2014.0070.
18. Zhu, X., Rizzo, P. (2014) "Sensors array for the health monitoring of truss structures by means of guided ultrasonic waves," *Journal of Civil Structural Health Monitoring*, Vol. 4, 3, pp 221-234. DOI: 10.1007/s13349-014-0078-3.
19. Zhu, X., Rizzo, P. (2013) "Guided ultrasonic waves for the health monitoring of sign support

- structures under varying environmental conditions,” *Structural Control and Health Monitoring*, Vol. 20, 2, pp 156–172. DOI: 10.1002/stc.481.
20. Phillips, R., **Zhu, X.**, Lanza di Scalea, F. (2012) “The influence of stress on electro-mechanical impedance measurements in rail steel,” *Material Evaluation*, Oct. Vol. 70, 10, pp 1213-1218.
 21. **Zhu, X.**, Rizzo, P. (2012) “A unified approach for the structural health monitoring of waveguides,” *Structural Health Monitoring*, Vol. 11, 6, pp 629-642. DOI:10.1177/1475921712438569.
 22. **Zhu, X.**, Rizzo, P., Marzani, A., and Bruck, J. (2010) “Ultrasonic guided waves for NDE/SHM of trusses,” *Measurement Science and Technology*, Vol. 20, 2, pp 156-172. DOI: 10.1088/0957-0233/21/4/045701.
 23. Zhou, Z., Feng, Z., Gao, Y. and **Zhu, X.** (2008). “Application of time -frequency analysis to ultrasonic guided wave signal interpretation,” *Journal of Beijing University of aeronautics and astronautics*, Vol.7, 833-837.
 24. Zhou, Z., Feng, Z., Gao, Y. and **Zhu, X.** (2008). “Application of guided waves to the defects inspection of large thin aluminum plate,” *Acta Aeronautica et Astronautica Sinica*, Vol. 29, 4: 1044-1048.

B2.2 Refereed Conference Proceedings

1. He, X., **Zhu, X.*** (2023). Two-dimensional acoustic emission source localization on a Laminated Veneer Lumber plate by Gaussian Process Regression. *International Workshop of Structural Health Monitoring*, Stanford, CA, U.S., Sept. 12-14, 2023.
2. Wu, Y., Zhang, P., **Zhu, X.***, Popovics, J. S. (2023). Sensitivity to Axial Stress and Temperature of Local Resonances in Rails. *International Workshop of Structural Health Monitoring*, Stanford, CA, U.S., Sept. 12-14, 2023.
3. Zhang, P., Wu, Y., Cui, R., **Zhu, X.*** (2023). Influence of Uniaxial Loads on Local Resonances. *International Workshop of Structural Health Monitoring*, Stanford, CA, U.S., Sept. 12-14, 2023.
4. Zhang, P., Wu, Y., **Zhu, X.*** (2023). Extracting local resonances using the electromechanical impedance method. *ASNT 31st Research Symposium*, Columbus, Ohio, June 26-30, 2023.
5. Wu, Y., Zhang, P., **Zhu, X.***, Popovics, J. (2023). Influences of uniaxial loads on local resonances in rails. *ASNT 31st Research Symposium*, Columbus, Ohio, June 26-30, 2023.
6. Cui, R., Wu, Y., Zhang, K., **Zhu, X.*** (2023). Infrared thermography and thermographic signal reconstruction for rail defect detection. *ASME Joint Rail Conference*, Baltimore, MD, April 11-13, 2023.
7. Wu, Y., **Zhu, X.*** (2023). Deep autoencoder for ultrasonic guided wave-based rail defect detection. *ASME Joint Rail Conference*, Baltimore, MD, April 11-13, 2023.
8. Wu, Y., Zhang, K., Zhang, P., Cui, R., **Zhu, X.*** (2023). Generating local resonances in free rails with piezoelectric elements. *ASME Joint Rail Conference*, Baltimore, MD, April 11-13, 2023.
9. Zhang, K., Cui, R., Wu, Y., **Zhu, X.*** (2023). Promoting local resonances in waveguide structures using the electromechanical impedance method. *SPIE Smart Structures/NDE Conference*, Active and Passive Smart Structures and Integrated Systems, Long Beach, CA, United States, March 12-16, 2023.
10. Zhang, P., Zhang, K., **Zhu, X.*** (2023). Guided waves mode separation based on the normal mode expansion method. *SPIE Smart Structures/NDE Conference*, Active and Passive Smart Structures and Integrated Systems, Long Beach, CA, United States, March 12-16, 2023.
11. Wu, Y., Zhang, K., Zhang, P., Cui, R., **Zhu, X.***, Popovics, J. S. (2023). Generating local resonances in free rails with piezoelectric elements. *SPIE Smart Structures/NDE Conference*, Active and

- Passive Smart Structures and Integrated Systems, Long Beach, CA, United States, March 12-16, 2023.
12. Wu, Y., Zhang, K., Huang, C., Lee, S., **Zhu, X.***, Popovics, J. S., Dersch, M. (2023). Local resonances for rail neutral temperature estimation. *SPIE Smart Structures/NDE Conference*, Active and Passive Smart Structures and Integrated Systems, Long Beach, CA, United States, March 12-16, 2023.
 13. Wu, Y., Huang, C., Lee, S., Zhang, K., **Zhu, X.***, Popovics, J. S., Dersch, M. (2022). A Machine Learning Framework for Rail Neutral Temperature Estimation using Impulse Vibrational Responses. *ASNT Research Symposium*, St. Louis, Missouri, June 20-23, 2022.
 14. Wu, Y., Zhang, K., **Zhu, X.***, Popovics, J. S. (2022). Zero Group Velocity Modes in Rails: a Numerical Study. *ASNT Research Symposium*, St. Louis, Missouri, June 20-23, 2022.
 15. Zhang, K., Cui, R., Wu, Y., **Zhu, X.*** (2022). Extracting Non-Propagating Modes in Waveguides via Electro-Mechanical Impedance Technique. *ASNT Research Symposium*, St. Louis, Missouri, June 20-23, 2022.
 16. Wu, Y., **Zhu, X.***, Baillargeon, J. (2022). Deep Autoencoder for Ultrasonic-based Rail Flaw Detection. *ASME Joint Rail Conference*, April 18-19, 2022.
 17. Wu, Y., **Zhu, X.***, Baillargeon, J. (2021). High-speed Rail Inspection Exploiting an Anomaly Detection Data Processing Approach. *International Workshop of Structural Health Monitoring*, Dec. 7-9, 2021.
 18. Wu, Y., Huang, C., Lee, S., Zhang, K., Dersch, M., Popovics, J. S., **Zhu, X.*** (2021). Rail Neutral Temperature Estimation using Numerical and Data-driven Models. *International Workshop of Structural Health Monitoring*, Dec. 7-9, 2021.
 19. Wu, Y., Zhang, K., Huang, C., Lee, S., Popovics, J.S., **Zhu, X.*** (2021). On the Existence of Zero Group Velocity Modes in Rails. *International Workshop of Structural Health Monitoring*, Dec. 7-9, 2021.
 20. Wu, Y., **Zhu, X.***, Huang, C., Lee, S., Dersch, M., Popovics, J. S. (2021). Rail neutral temperature estimation using field data, numerical models, and machine learning. *ASME Joint Rail Conference*, April 20-21, 2021.
 21. Wu, Y., **Zhu, X.***, Huang, C., Lee, S., Dersch, M., Popovics, J. S. (2021). Rail neutral temperature estimation using impulse vibration and machine learning. *SPIE Smart Structures + Nondestructive evaluation*, Long Beach, California, March 7-10th, 2021.
 22. Lanza di Scalea, F., Liang, A., Sternini, S., Capriotti, M., Datta, D., **Zhu, X.**, Wilson, R. (2019). Ultrasonic Identification of Rail Tracks from Natural Wheel Excitations: Potential for High-Speed and High-Redundancy Rail Inspection. *International Workshop of Structural Health Monitoring*, 10/01/2019.
 23. **Zhu, X.**, Hu, H., Sternini, S., Xu, S. & Lanza di Scalea, F. (2019). Stretchable ultrasonic transducer arrays for three-dimensional imaging on complex surfaces. *International Workshop of Structural Health Monitoring*, 10/01/2019.
 24. Liang, A., Sternini, S., Capriotti, M., **Zhu, X.**, Lanza di Scalea, F. & Wilson, R. (2019). Passive extraction of Green's function of solids and application to high-speed rail inspection. Vol. 10970. *SPIE Smart Structures & Nondestructive Evaluation*. Other, Published, 03/23/2019.
 25. **Zhu, X.**, Sternini, S., Capriotti, M., Liang, A., Mariani, S., Lanza di Scalea, F. (2017) "High-speed non-contact passive-only ultrasonic inspection of rails from deconvolution of wheel-generated noise," *Intl. Workshop on Structural Health Monitoring*, September 12-14, 2017.
 26. **Zhu, X.**, Lanza di Scalea, Fateh, M. (2017). Thermal stress characterization using the electro-mechanical impedance method, *Proc. SPIE 10164*, Active and Passive Smart Structures and

Integrated Systems 2017, 1016407.

27. **Zhu, X.**, Lanza di Scalea, Fateh, M. (2016). Thermal stress measurement in continuous welded rails using the hole-drilling method, *Proc. 2016 Joint Rail Conference*, Paper No. JRC2016-5719.
28. Mariani, S., Nguyen, T. V., **Zhu, X.**, Sternini, S., Lanza di Scalea, F., Fateh, M., Wilson, R. (2016). Non-contact ultrasonic guided wave inspection of rails: next generation approach, *Proc. 2016 Joint Rail Conference*, Paper No. JRC2016-5776, pp. V013T06B024, 8 pages.
29. Mariani, S., Nguyen, T., **Zhu, X.**, Lanza di Scalea, F. and Fateh, M. (2015). Non-contact ultrasonic guided wave inspection of rails: field test results and update, *Sensors and Smart Structures Technologies for Civil, Mechanical and Aerospace Systems (SPIE Vol 9435)*, J.P. Lynch, C-B. Yun, K-W. Wang, eds., part of SPIE Smart Structures/NDE Symposium, San Diego, CA, pp. 86921L1-86921L12, March 8-12.
30. Kijanka, P., Packo, P., **Zhu, X.**, Staszewski, W. and Lanza di Scalea, F (2014). Three-dimensional temperature effect modelling of piezoceramic transducers used for structural health monitoring, *Proceedings of 5th Asia-Pacific Workshop on Structural Health Monitoring (AWPSHM 2014)*, Shenzhen, China, December 4-5, 2014.
31. **Zhu, X.**, Lanza di Scalea, F. and Fateh, M., (2014). Temperature and axial stress effects in electro-mechanical impedance method-based structural health monitoring, *Proceedings of SPIE Smart Structures/NDE Annual International Symposium - Health Monitoring of Structural and Biological Systems*, T. Kundu, ed., San Diego, CA, March 9-13, Vol. 9064, pp 90641O1-90641O12.
32. Tippmann, J., **Zhu, X.** and Lanza di Scalea, F. (2014). Probabilistic structural health monitoring using passive-only damage detection by reciprocity of Green's functions reconstructed from diffuse acoustic fields, *Proc. 7th European Workshop on Structural Health Monitoring, (EWSHM 2014)*, Nantes, France, July 8-11, pp. 1-8.
33. Nucera, C., Phillips, R., **Zhu, X.**, Mariani, S., Lanza di Scalea, F., Fateh, M. and Carr, G. (2013) Nonlinear guided waves for neutral temperature measurement in continuous welded rails: results from laboratory and field tests, *Proceedings of SPIE Smart Structures/NDE Annual International Symposium - Health Monitoring of Structural and Biological Systems VII*, T. Kundu, ed., San Diego, CA, Vol. 8695, pp. 8695281-86952812.
34. **Zhu, X.**, and Rizzo, P. (2011). Combining guided waves and electromechanical impedance method for SHM applications, *Proc. 8th Intl. Workshop on Structural Health Monitoring*, Ed. F.-K. Chang, Stanford, CA, September 13-15, 2584-2591.

B2.3 Other Conference Proceedings

35. Hong, A., Singhi, N., Grant, V., **Zhu, X.**. Carbon mineralization by soil and concrete via nanobubbles, 33rd Annual International Conference on Soil, Water, Energy, and Aire, San Diego, CA, March 2024.
36. Diedrich, E., He, X., **Zhu, X.**, Pantelides, C., Hans-Erik, B., Rammer, D. (2021). Braced frame with mass timber buckling restrained brace for high seismic regions,” Forest Products Society, 2021.
37. **Zhu, X.**, Lee, S., Bittner, J., Popovics, J. S., Geesey, M., Donahue, C., Johnson, P. (2019). Laboratory characterization of carbon exposed sandstone, 46th Annual Review of Progress in Quantitative Nondestructive Evaluation, 2019 Portland, OR.
38. Huang, C., Lee, S., Dersch, M., Popovics, J. S., **Zhu, X.** (2019). Effect of stress on impact-based vibration in steel rails, 46th Annual Review of Progress in Quantitative Nondestructive Evaluation, 2019 Portland, OR.
39. **Zhu, X.**, Rizzo, P., and Bruck, J. (2011). Sign support structures tested by means of guided waves, *SEM Annual Conference & Exposition on Experimental and Applied Mechanics*, Mohegan Sun, Uncasville, Connecticut USA June 13 - 16.

40. **Zhu, X.**, and Rizzo, P., (2011). Guided ultrasonic waves for the health monitoring of existing sign support structures, *Proc. of SPIE's 18th Annual International Symposium on Smart Structures and Materials – Sensors and Smart Structures Technologies for Civil, Mechanical, and Aerospace Systems 2011*, Proc. SPIE 7984, 79840E (2011); doi:10.1117/12.879268.
41. **Zhu, X.**, and Rizzo, P., (2011). Guided ultrasonic waves under varying environmental conditions for sign support structures, *Proc. ASNT 20th Annual Research Symposium & Spring Conference*, San Francisco, CA, Mar. 21-25.
42. **Zhu, X.** and Rizzo, P., Bruck, J. (2010). Guided waves for SHM of a large truss structure, *Proceedings of SPIE's 17th Annual International Symposium on Smart Structures and Materials – Sensors and Smart Structures Technologies for Civil, Mechanical and Aerospace System, Health Monitoring of Structural and Biological Systems 2010*, Proc. of SPIE Vol. 7650, 76500O.

B2.4 Technical Reports

1. Popovics, J. S., Dersch, M. S., **Zhu, X.** (2020). Vibration-based longitudinal rail stress estimation exploiting acoustic measurement and machine learning. Transportation Research Board Rail Safety IDEA project 41.
2. Huang, C., **Zhu, X.**, Popovics, J. S. (2019). Use of Impulse-based Vibration for Longitudinal Stress Estimation. TTCI Technology Digest August 2019, TD19-015.
3. Rizzo, P. & **Zhu, X.** (2010). Sensing technology for damage assessment of sign supports and cantilever poles- final report, Penn Department of Transportation, Contract No. 519691-PIT 008
4. **Zhu, X.**, Rizzo, P., & Tajari, M. (2010). Sensing technology for damage assessment of sign supports and cantilever poles, Year 2, Penn Department of Transportation, Contract No. 519691-PIT 008

B3. Professional Meetings, Symposia, and Conferences

As of February 2024 – *Invited Talks and Seminars: 16; Conference & poster presentations: 44* (34 after joining the University of Utah). Underline indicate mentored student(s) at the University of Utah, and * indicates corresponding author.

B3.1 Invited Talks/Seminars

1. “Local resonances and elastic metamaterial-enhanced condition assessment of civil and energy infrastructures”, *Technical Committee on Vibration and Sound (TCVS) seminar, American Society of Mechanical Engineers*, February 2, 2024.
2. “Harnessing local resonances in waveguides for the assessment of civil and energy infrastructures”, *Construction Materials Seminar, Civil & Environmental Engineering, University of Illinois, Urbana, Illinois*, February 22, 2023.
3. “A Machine Learning Framework for Rail Neutral Temperature Estimation using Impulse Vibrational Responses”, *ASNT Research Symposium*, St. Louis, Missouri, June 20-23, 2022.
4. “Impulse Vibration-Based Longitudinal Rail Stress Estimation from a Wave Propagation and Machine Learning perspective,” *Dept. Mechanical Engineering seminar, New Mexico Tech*, April, 2021.
5. “Roadway ice/snow detection using a novel infrared thermography technology,” *FHWA Aurora board meeting*, Oct. 9, 2019.
6. “Nondestructive evaluation and structural health monitoring of rail tracks,” *Utah Transit Authority*, Sept. 26, 2019.

7. "Ice/snow detection with infrared thermography at high-speed intersections," *Utah DOT*, August 15, 2019.
8. "Nonlinear vibrational/ultrasonic evaluation of Carbon-treated Berea sandstone," *DOE Energy Frontier Research Center - GSCO2 final meeting*, May 21, 2019.
9. "NDE for railroad and beyond," 2019 TRB NDT committee meeting presentation, Jan. 14, 2019.
10. "Pushing the limits of sensing technology for intelligent infrastructure and health monitoring," *Dept. Civil & Environmental Engineering, Clarkson University*, Potsdam, New York, April 2018.
11. "Pushing the limits of sensing technology for intelligent infrastructure and health monitoring," *Dept. Civil & Environmental Engineering, Virginia Tech*, Blacksburg, Virginia, March 2018.
12. "Pushing the limits of sensing technology for intelligent infrastructure and health monitoring," *Dept. Civil & Environmental Engineering, University of Utah*, Salt Lake City, Utah, Feb. 2018.
13. "Linear and nonlinear vibrational/ultrasonic evaluation of Berea sandstone," *ASA Fall Conference 2017*, New Orleans, LA, United States, Dec. 08, 2017.
14. "Passive reconstruction of impulse response functions and its applications in SHM," *Dept. Civil and Environmental Engineering, University of Strathclyde*, U.K, April 2017.
15. "Electro-mechanical impedance-based SHM and its applications on high-speed railway system," *NDT laboratory, Beihang University*, Beijing, China, Jan. 2015.
16. "The Applications of ultrasonic guided waves on the highway infrastructure maintenance," *Dept. Mechanical Engineering, Beijing University of Technology*, Beijing, China, July, 2011.

B3.2 Conference & Poster Presentation

1. Ramezanpour Kami, M., Wu, Y., Zhu, X.* (2024). "Crack detection in railroad timber ties using dual-spectrum images and YOLOv8," *Transportation Research Board Annual Meeting 2024*, Washington, DC, January, 2024. (Poster)
2. Wu, Y., Zhang, K., Zhu, X.*, Popovics, J. (2023). Local resonances for rail thermal stress estimation: modeling and field test. *ASME 2023 International Mechanical Engineering Congress and Exposition (IMECE 2023)*, New Orleans, LA, U.S., Oct. 29- Nov.4, 2023.
3. Zhang, P., Wang, P., Zhu, X.* (2023). Harnessing zero-group velocity and evanescent modes in structural components. *ASME 2023 International Mechanical Engineering Congress and Exposition (IMECE 2023)*, New Orleans, LA, U.S., Oct. 29- Nov.4, 2023.
4. Zhang, P., Chen, F., Zhang, K., Wang, P., Zhu, X.* (2023). Maxon and its local resonance in elastic metamaterials. *ASME 2023 International Mechanical Engineering Congress and Exposition (IMECE 2023)*, New Orleans, LA, U.S., Oct. 29- Nov.4, 2023.
5. He, X., Zhu, X.* (2023). Two-dimensional acoustic emission source localization on a Laminated Veneer Lumber plate by Gaussian Process Regression. *International Workshop of Structural Health Monitoring*, Stanford, CA, U.S., Sept. 12-14, 2023.
6. Wu, Y., Zhang, P., Zhu, X.*, Popovics, J. S. (2023). Sensitivity to Axial Stress and Temperature of Local Resonances in Rails. *International Workshop of Structural Health Monitoring*, Stanford, CA, U.S., Sept. 12-14, 2023.
7. Zhang, P., Wu, Y., Cui, R., Zhu, X.* (2023). Influence of Uniaxial Loads on Local Resonances. *International Workshop of Structural Health Monitoring*, Stanford, CA, U.S., Sept. 12-14, 2023.
8. Zhao, Y., Yang, H., Zhang, K., Zhu, X., Hanson, B., Taubman, M., Sinkov, A. (2023). Innovative methods for interrogation of DSC internal conditions. *DOE Spent Fuel Waste Science & Technology (SFWST) Annual Workshop*, Las Vegas, NV, June 26-28, 2023. (Poster)
9. Zhang, P., Wu, Y., Zhu, X.* (2023). Extracting local resonances using the electromechanical impedance method. *ASNT 31st Research Symposium*, Columbus, Ohio, June 26-30, 2023. (Poster)

10. Wu, Y., Zhang, P., **Zhu, X.***, Popovics, J. (2023). Influences of uniaxial loads on local resonances in rails. *ASNT 31st Research Symposium*, Columbus, Ohio, June 26-30, 2023.
11. Zhang, P., Chen, F., **Zhu, X.***, Wang, P. (2023). Roton- and maxon-like dispersion relations in elastic metamaterial. *184th Meeting of the Acoustical Society of America*, Chicago, IL, May 8-12, 2023.
12. Kazemi, A., Deshmukh, K., Chen, F., Liu, Y., Deng, B., **Zhu, X.**, Wang, P. (2023). Achieving any desirable dispersion curves using non-local photonic crystals. *184th Meeting of the Acoustical Society of America*, Chicago, IL, May 8-12, 2023.
13. Cui, R., Wu, Y., Zhang, K., **Zhu, X.*** (2023). Infrared thermography and thermographic signal reconstruction for rail defect detection. *ASME Joint Rail Conference*, Baltimore, MD, April 11-13, 2023.
14. Wu, Y., **Zhu, X.*** (2023). Deep autoencoder for ultrasonic guided wave-based rail defect detection. *ASME Joint Rail Conference*, Baltimore, MD, April 11-13, 2023.
15. Wu, Y., Zhang, K., Zhang, P., Cui, R., **Zhu, X.*** (2023). Generating local resonances in free rails with piezoelectric elements. *ASME Joint Rail Conference*, Baltimore, MD, April 11-13, 2023.
16. Zhang, K., Cui, R., Wu, Y., **Zhu, X.*** (2023). Promoting local resonances in waveguide structures using the electromechanical impedance method. *SPIE Smart Structures/NDE Conference*, Active and Passive Smart Structures and Integrated Systems, Long Beach, CA, United States, March 12-16, 2023.
17. Zhang, P., Zhang, K., **Zhu, X.*** (2023). Guided waves mode separation based on the normal mode expansion method. *SPIE Smart Structures/NDE Conference*, Active and Passive Smart Structures and Integrated Systems, Long Beach, CA, United States, March 12-16, 2023.
18. Wu, Y., Zhang, K., Zhang, P., Cui, R., **Zhu, X.***, Popovics, J. S. (2023). Generating local resonances in free rails with piezoelectric elements. *SPIE Smart Structures/NDE Conference*, Active and Passive Smart Structures and Integrated Systems, Long Beach, CA, United States, March 12-16, 2023.
19. Wu, Y., Zhang, K., Huang, C., Lee, S., **Zhu, X.***, Popovics, J. S., Dersch, M. (2023). Local resonances for rail neutral temperature estimation. *SPIE Smart Structures/NDE Conference*, Active and Passive Smart Structures and Integrated Systems, Long Beach, CA, United States, March 12-16, 2023.
20. Wu, Y., **Zhu, X.*** (2023). Rail defect detection using ultrasonic A-scan data and deep autoencoder. *Transportation Research Board Annual Meeting 2023*, Washington, DC, January, 2023. (Poster)
21. He, X., Wu, Y., Zhang, K., **Zhu, X.***, Yang, X. (2023). Roadway snow estimation using dual-spectrum camera images and computer vision. *Transportation Research Board Annual Meeting 2023*, Washington, DC, January, 2023. (Poster)
22. Wu, Y., Zhang, K., **Zhu, X.***, Popovics, J. S. (2022). Zero Group Velocity Modes in Rails: a Numerical Study. *ASNT Research Symposium*, St. Louis, Missouri, June 20-23, 2022. (Poster)
23. Zhang, K., Cui, R., Wu, Y., **Zhu, X.***, Popovics, J. S. (2022). Extracting Non-Propagating Modes in Waveguides via Electro-Mechanical Impedance Technique. *ASNT Research Symposium*, St. Louis, Missouri, June 20-23, 2022. (Poster)
24. Wu, Y., **Zhu, X.***, Baillargeon, J. (2022). Deep Autoencoder for Ultrasonic-based Rail Flaw Detection. *ASME Joint Rail Conference*, April 18-19, 2022.
25. Wu, Y., **Zhu, X.*** (2021). "Rail neutral temperature estimation using field data, numerical models, and machine learning," T3e Webinar – Smart Sensors and Infrastructure, USDOT Office of Research and Technology, July 29, 2021.
26. Zhang, K., **Zhu, X.*** (2021). "Polarized infrared thermography for roadway snow/ice detection," T3e Webinar – Smart Sensors and Infrastructure, USDOT Office of Research and Technology, July 29, 2021.
27. Wu, Y., **Zhu, X.***, Huang, C., Lee, S., Dersch, M., Popovics, J. S. (2021). "Rail neutral temperature estimation using field data, numerical models, and machine learning," AMSE Joint Rail Conference,

April 20-21, 2021.

28. Wu, Y., **Zhu, X.***, Huang, C., Lee, S., Dersch, M., Popovics, J. S. (2021). "Rail Neutral Temperature Estimation using local vibration modes and machine learning," SPIE Smart Structures + Nondestructive evaluation, Long Beach, California, March 7-10th, 2021.
29. Wu, Y., **Zhu, X.***, Huang, C., Lee, S., Dersch, M., Popovics, J. S. (2021). "Rail neutral temperature estimation using impulse vibration and machine learning," ASNT Research Symposium 2021.
30. Huang, C., Lee, S., Wu, Y., **Zhu, X.**, Dersch, M., Popovics, J. S. (2020). "Rail stress condition monitored using impulse vibration measurements," NDE/NDT Structural Materials Technology for Highways and Bridges (SMT) and the International Symposium on Non-Destructive Testing in Civil Engineering (NDT-CE). (Poster)
31. Huang, C., **Zhu, X.**, Lee, S., Popovics, J. S., (2020). "Effect of stress on impact-based vibration in steel rails," 47th Annual Review of Progress in Quantitative Nondestructive Evaluation, 2020.
32. "Vibration-Based Longitudinal Rail Stress Estimation Exploiting Contactless Measurement and Machine Learning (Rail Safety IDEA 41)," TRB poster session, Jan. 14, 2020. (Poster)
33. **Zhu, X.**, Lee, S., Bittner, J., Popovics, J. S., Geesey, M., Donahue, C., Johnson, P. (2019). "Laboratory characterization of carbon exposed sandstone," 46th Annual Review of Progress in Quantitative Nondestructive Evaluation, 2019 Portland, OR.
34. Huang, C., Lee, S., Dersch, M., Popovics, J. S., **Zhu, X.** (2019). "Effect of stress on impact-based vibration in steel rails," 46th Annual Review of Progress in Quantitative Nondestructive Evaluation, 2019 Portland, OR.
35. "Thermal stress characterization using the electro-mechanical impedance method," *SPIE Smart Structures/NDE Conference*, Active and Passive Smart Structures and Integrated Systems, Portland, Oregon, United States, March 25, 2017.
36. "In-situ thermal stress estimation in structures using the Electro-Mechanical Impedance method", *IMAC-XXXV Conference and Exposition on Structural Dynamics*, Garden Grove, CA, Feb.2, 2017.
37. "Thermal stress characterization using the impedance-based structural health monitoring system," *SPIE Smart Structures/NDE Conference*, Active and Passive Smart Structures and Integrated Systems, Las Vegas, Nevada, United States, March 20, 2016.
38. "Thermal stress measurement in continuous welded rails using the hole-drilling method," *SPIE Smart Structures/NDE Conference*, Sensors and Smart Structures Technologies for Civil, Mechanical, and Aerospace Systems, Las Vegas, Nevada, United States, March 20, 2016.
39. "Thermal stress measurement in continuous welded rails using the hole-drilling method," *ASME-Joint Rail Conference*, Columbia, SC, United States, April 15, 2016.
40. "On the study of the influences of temperature and axial load to the impedance-based structural health monitoring system," *11th International Workshop on Advanced Materials and Smart Structures Technology*, University of Illinois Urbana-Champaign, August 2, 2015.
41. "On the study of the in-situ thermal stress measurement using a hole-drilling method," *11th International Workshop on Advanced Materials and Smart Structures Technology*, University of Illinois Urbana-Champaign, August 2, 2015.
42. "Temperature And Axial Stress Effects In Electro-Mechanical Impedance Method-Based Structural Health Monitoring," *SPIE Smart Structures/NDE Conference*, Health Monitoring of Structural and Biological Systems, San Diego, CA, United States, March 9-13, 2014.
43. "Axial Stress Determination Using Impedance Based Method And Its Application On The Thermal Stresses Measurement In Continuous Welded Rail," *SPIE Smart Structures/NDE Conference*, Health Monitoring of Structural and Biological Systems, San Diego, CA, March 10-14, 2013.
44. "Guided waves for SHM of a large truss structure," *SPIE Smart Structures/NDE Conference*, Sensors

and Smart Structures Technologies for Civil, Mechanical and Aerospace System, Health Monitoring of Structural and Biological Systems, San Diego, CA, March 10-14, 2010.

C. Teaching and Advising

C1. Instructional Summary

Course #	Course Title	Term/Year	Credits	Enrollment
CVEEN 7920	Infrastructure sensing & health monitoring (G)	Fall 2018	3	14
CVEEN 2010	Statics (U)	Spring 2019	3	28
CVEEN 7920	Infrastructure sensing & health monitoring (G)	Fall 2019	3	4
CVEEN 2010	Statics (U)	Spring 2020	3	23
CVEEN 5920*	Smart City & Infrastructure (U&G)	Spring 2020	3	8
CVEEN 6920	Infrastructure sensing & health monitoring (G)	Fall 2020	3	4
CVEEN 2010	Statics (U)	Spring 2021	3	13
CVEEN 5210/6210	Structural Analysis 2 (U&G)	Spring 2021	3	7+6
CVEEN 2010	Statics (U)	Fall 2021	3	41
CVEEN 6920	Infrastructure sensing & health monitoring (G)	Fall 2022	3	8
CVEEN 2010	Statics (U)	Fall 2022	3	38
CVEEN 5210/6210	Structural Analysis II (U&G)	Spring 2023	3	3+11
CVEEN 2010	Statics (U)	Spring 2023	3	30
CVEEN 2010	Statics (U)	Fall 2023	3	33
CVEEN 5210/6210	Structural Analysis II (U&G)	Spring 2024	3	7+4

U – Undergraduate course; G – Graduate course; * – Guest lecture

C2. Student and Participant Evaluations

Course #	Term/Year	Credits	Enrollment	Evaluation	
				Course	Instructor
CVEEN 7920	Fall 2018	3	14	5.32/6.0	5.44/6.0
CVEEN 2010	Spring 2019	3	28	5.38/6.0	5.23/6.0
CVEEN 7920	Fall 2019	3	4	5.64/6.0	5.75/6.0
CVEEN 2010	Spring 2020	3	23	5.07/6.0	5.19/6.0
CVEEN 6920	Fall 2020	3	4	N/A	N/A

CVEEN 2010	Spring 2021	3	13	N/A	N/A
CVEEN 5210/6210	Spring 2021	3	7+6	N/A	N/A
CVEEN 2010	Fall 2021	3	41	5.25/6.0	5.2/6.0
CVEEN 6920	Fall 2022	3	8	5.71/6.0	5.86/6.0
CVEEN 2010	Fall 2022	3	36	5.10/6.0	5.17/6.0
CVEEN 2010	Spring 2023	3	31	4.88/6.0	4.88/6.0
CVEEN 5210/6210	Spring 2023	3	3+11	5.01/6.0	5.01/6.0
CVEEN 2010	Fall 2023	3	33	4.92/6.0	4.88/6.0

N/A – Updated evaluation system implemented without quantitative evaluation

C3. Advising

C3.1 Graduate Advisees: Graduated

Student	Department	Degree	Thesis/dissertation defended
1. Yuning Wu	Civil & Environmental	Ph.D.	Summer 2023
2. Nemish Atreya	Civil & Environmental	M.S.	Summer 2023

C3.2 Graduate Advisees: Current

Student	Department	Degree	Expected Graduation	Advanced to Candidacy (Y/N)
1. Keping Zhang	Civil & Environmental	Ph.D.	Fall 2024	N
2. Xiangdong He	Civil & Environmental	Ph.D.	Fall 2024	N
3. Peng Zhang	Civil & Environmental	Ph.D.	Summer 2026	N
4. Moein Ramezanzpour	Civil & Environmental	Ph.D.	Summer 2026	N

C3.2 Graduate Thesis Committees: Current

1. Abdullahal Mamun, Ph.D., Civil Engineering
2. Suman Neupane, Ph.D., Civil Engineering
3. Sayal Shrestha, Ph.D., Civil Engineering

4. Zilong Zhao, Ph.D., Mechanical Engineering
5. Md Nahid Hasan, Ph.D., Mechanical Engineering
6. Albert Dahal, Ph.D., Civil Engineering
7. Fei Chen, Ph.D., Mechanical Engineering
8. Qinzhen Wang, Ph.D., Civil Engineering
9. Zhidi Wu, Ph.D., Civil Engineering
10. Junwei Liu, Ph.D., Civil Engineering
11. Sharat Paul, Ph.D., Mechanical Engineering
12. Cyrus Safai, M.S., Civil Engineering

C3.3 Graduate Thesis Committees: Graduated

1. Duc Quang Tran, Ph.D., Civil Engineering, 2023
2. Emily R. Diedrich, Ph.D., Civil Engineering, 2023
3. Carlos Hermoza, M.S., Civil Engineering, 2023
4. Mohammad Farhadmanesh, Ph.D., Civil Engineering, 2022
5. Faisal Jamil, M.S., Mechanical Engineering, 2022
6. Ijan Dangol, Ph.D., Civil Engineering, 2022
7. Abu Sufian Mohammad Asib, Ph.D., Civil Engineering, 2021
8. Reza Sheibani, Ph.D., Civil Engineering, 2021
9. Jiayue Xue, Ph.D., Civil Engineering, 2021
10. Zhongming Xiang, Ph.D., Civil Engineering, 2021
11. Avinash Rajesh Rishi, M.S., Civil Engineering, 2018

C3.4 Undergraduate Research Assistants

1. Verl Grant, Jan. 2024-Aug. 2024 (Metamaterial-enhanced roton-like zero-group-velocity ultrasound for high-quality through-wall power transmission)
2. Verl Grant, Undergraduate Research Opportunity Program (UROP), Jan. 2024-May 2024 (Carbon storage in concrete debris using nanobubbles)
3. Verl Grant, Undergraduate Research Opportunity Program (UROP), Feb. 2023-Aug. 2023 (Carbon storage in concrete debris using nanobubbles)
4. Madeline Marie Melody, Engineering Scholars Program, Feb. 2023-May 2023 (Local resonances for stress measurement in concrete structures)
5. Adrian M. Porras, 2019-2020 (Honor thesis: Acoustic emission monitoring on reinforced concrete frames with improved seismic resilience)

C3.5 Postdoctoral Trainees

1. Ranting Cui, Ph.D., September 2021- August 2022 (Currently assistant professor at Guangxi University, China)

D. Service

D1. University Service

- Department outreach activity, UU & SLCC STEM Resource Fair, 09/2022
- Department outreach/recruitment activity, Copper Hills High School, 05/2022
- URS Poster evaluator, Undergraduate Research Symposium, University of Utah, 2020-2022
- Event host, “Smart Sensors for Safer and Resilient Infrastructure: Laboratory Demonstration”, Engineering Day Research Symposium, COE, 2020, 2022 (with over 30 participants), 2023 (with over 60 participants)
- Judge, University of Utah Science and Engineering Fair, 2021
- Committee member, Structures faculty search committee, CVEEN department, 2023
- Committee member, Graduate committee, CVEEN department, 2023-present
- Committee member, Space utilization committee, CVEEN department, 2022-present
- Committee member, Graduate student recruitment committee, CVEEN department, 2019-present
- Committee member, UAC instructor search committee, CVEEN department, 2020
- Committee member, Technology coordinator search committee, CVEEN department, 2020
- Committee member, ABET & Undergraduate committee, CVEEN department, 2018-2023
- Committee member, Cyber technology integration committee, CVEEN department, 2018-2020
- Committee member, Strategic hiring & planning committee, CVEEN department, 2018-2020

D2. Professional Service

D2.1 Journal Editorships

- Associate editor on the Editorial Board for *Journal of Nondestructive Evaluation*, 2021-present
- Guest editor, special issue “Structural Health and Condition Monitoring with Acoustic Emission and Guided Ultrasonic Waves: Sensors and Transducers”, *Sensors*, 2023
- Review editor on the Editorial Board of *Frontiers in Built Environment*, 2020-present

D2.2 Professional Association & Conference Service

- Committee member, Technical Program Committee, 2024 *ASME/IEEE Joint Rail Conference*, American Society of Mechanical Engineers, Columbia, SC, May 13-15, 2024.
- Senate member, SHM/NDE Technical Executive Committee, *ASME Adaptive Structures and Material Systems (ASMS) branch*, 2023-present

- Committee member, Standing committee on Railroad Infrastructure Design and Maintenance AR050, *Transportation Research Board*, 2021-2025
- Committee member, ENGC AI/ML committee, *American Society for Nondestructive Testing*, 2023-present
- Committee member, Research Council, *American Society for Nondestructive Testing*, 2021-present
- Committee member, Publication committee, *American Society for Nondestructive Testing*, 2022-present
- Committee member, Mentoring committee, *American Society for Nondestructive Testing*, 2022-present
- Session Chair, 01-17-01 & 01-17-02: Congress-Wide Symposium on NDE & SHM: Computational nondestructive evaluation and structural health monitoring, *ASME International Mechanical Engineering Congress & Exposition*, New Orleans, LA, November 2, 2023
- Organizer, 01-17-01 & 01-17-02: Congress-Wide Symposium on NDE & SHM: Computational nondestructive evaluation and structural health monitoring, *ASME International Mechanical Engineering Congress & Exposition*, New Orleans, LA, October 29-November 2, 2023
- Judge for Student Poster Competition, Congress-Wide Symposium on NDE & SHM: Computational nondestructive evaluation and structural health monitoring, *ASME International Mechanical Engineering Congress & Exposition*, New Orleans, LA, October 29-November 2, 2023
- Session Chair, 05-02: Monitoring Civil Infrastructure, *ASME Smart Materials, Adaptive Structures and Intelligent Systems (SMASIS) 2023*, Austin, TX, September 11-13, 2023
- Organizer, 05-02: Monitoring Civil Infrastructure, *ASME Smart Materials, Adaptive Structures and Intelligent Systems (SMASIS) 2023*, Austin, TX, September 11-13, 2023
- Technical program committee (TPC) member, 2023 *IEEE 11th International Conference on Information, Communication and Networks*, August 17-20, 2023, Xi'an, Shaanxi, China
- Committee member, Scientific Committee, 2023 *ASME/IEEE Joint Rail Conference*, American Society of Mechanical Engineers, Baltimore, MD, April 11-13 2023
- Committee member, Planning Committee, 2023 *ASME/IEEE Joint Rail Conference*, American Society of Mechanical Engineers, Baltimore, MD, April 11-13 2023
- Organizing member, *7th International Conference on Experimental Vibration Analysis for Civil Engineering Structures*, University of California San Diego, La Jolla, CA, July 12-14, 2017
- Chairing Sessions, session on “Smart Sensing and Signal Processing for Diagnostics”, *SPIE Smart Structures/NDE*, Portland, OR, March 2017
- Chairing Sessions, session on “Guided Waves I: Civil Infrastructures Monitoring”, *SPIE Smart Structures/NDE*, Portland, OR, March 2017
- Chairing Sessions, session on “Guided Waves for SHM in Aerospace Applications II”, *SPIE Smart Structures/NDE*, San Diego, CA, March 2014

D2.3 Grant and Journal Reviewing

- Reviewer, National Science Foundation, 2021, 2023
- Panelist, National Science Foundation, Mechanics of Materials and Structures program, 2023
- Grant reviewer, US Department of Energy-Nuclear Engineering (DOE-NE) Consolidated Innovative Nuclear Research, 2020, 2021, 2022, 2023, 2024
- Grant reviewer, US Department of Energy Small Business Innovation Research (SBIR), 2021
- Grant reviewer, Dutch Research Council, NWO Talent Programme Vidi – Applied and Engineering Sciences (AES), 2022
- Technical report reviewer, Mountain-Plains Consortium/Upper Great Plains Transportation Institute, 2021
- Journal Reviewer
 - *Engineering Structures*
 - *Optics and Lasers in Engineering*
 - *Composites Part B: Engineering*
 - *Structural Health Monitoring*
 - *Smart Materials and Structures*
 - *Ultrasonics*
 - *NDT&E International*
 - *Experimental Mechanics*
 - *Journal of Intelligent Material Systems and Structures*
 - *Journal of Nondestructive Evaluation*
 - *ASME Journal of Nondestructive Evaluation, Diagnostics and Prognostics of Engineering Systems*
 - *IEEE Transactions on Intelligent Transportation Systems*
 - *Sensors*
 - *Composites Communication*
 - *Journal of Performance of Constructed Facilities*
 - *Applied Sciences*
 - *Journal of Vibration & Acoustics*
 - *Functional Composites and Structures*
 - *Journal of Mechanical Engineering Science*
 - *International Journal of Distributed Sensor Networks*
 - *Material Research Express*
 - *Journal of Modern Transportation*
 - *International Journal for Numerical Methods in Biomedical Engineering*
 - *IEEE Sensors Journal*
 - *Research in Nondestructive Evaluation*
 - *Journal of Civil Structural Health Monitoring*
 - *Journal of Vibration and Control*
 - *IEEE/ASME Transactions on Mechatronics*
 - *Materials*
 - *Applied Acoustics*
 - *Materials Evaluation*
 - *Micromachines*
 - *Composite Structures*
 - *IETE Journal of Research*
 - *Measurement*
 - *Wood Science and Technology*

E. Honors, Awards and Media Reports

- Interview with China Global Television Network on ‘Ohio Train Derailment to cost millions in cleanup’, February 21, 2023
(https://www.youtube.com/watch?v=6qfj3rOu_9g&t=42s&ab_channel=CGTNAmerica)
- Utah Pathways to STEM Faculty Fellowship (\$2,500), 2022-2023
- ASNT Travel Grant (\$1,000) to my student, Yuning Wu, the American Society for Nondestructive Testing, 2022
- ASNT Travel Grant (\$1,000) to my student, Keping Zhang, the American Society for Nondestructive Testing, 2022
- UC San Diego News Center
https://ucsdnews.ucsd.edu/pressrelease/flexible_ultrasound_patch_could_make_it_easier_to_inspect_damage_in_odd_shapes
- Science Daily <https://www.sciencedaily.com/releases/2018/03/180323141345.htm>
- Tech Xplore <https://techxplore.com/news/2018-03-flexible-ultrasound-patch-easier-odd-shaped.html>
- EurekAlert AAAS https://www.eurekalert.org/pub_releases/2018-03/uoc--fup031918.php
- The Engineer <https://www.theengineer.co.uk/flexible-patch-unlocks-potential-ultrasound-inspecting-irregular-components/>
- Communications of ACM <https://cacm.acm.org/news/226527-ltrasound-patch-could-make-it-easier-to-inspect-damage-in-odd-shaped-structures/fulltext>
- ASME <https://www.asme.org/topics-resources/content/ultrasound-patch-monitors-critical-components>
- Railway Technology <https://www.railway-technology.com/news/flexible-ultrasound-patch-assist-railway-track-inspection/>
- Dissertation Fellowship, University of California, San Diego, 2016
- NSF Scholarship, University of Illinois at Urbana-Champaign, Asia-Pacific Summer School in Smart Structures Technology (\$2,000), 2015
- CALRA Fellowship, Jacobs School of Engineering, UCSD, 2011-2012