

Joel B. Harley

CONTACT INFORMATION

Department of Electrical and Computer Engineering
University of Florida
216 Larsen Hall
Gainesville, FL 32611 USA

E-mail: joel.harley@ufl.edu
Voice: (732) 567-6786
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RESEARCH INTERESTS

Signal processing, ultrasonics, complex wave propagation, structural health monitoring, data science, compressed sensing, matched field processing, machine learning, big data, transform theory, time reversal, detection and estimation, statistics, pattern recognition

EDUCATION

Carnegie Mellon University, Pittsburgh, Pennsylvania USA
Ph.D., Electrical and Computer Engineering, May 2014
M.S., Electrical and Computer Engineering, May 2011

Tufts University, Medford, Massachusetts USA
B.S., Electrical Engineering, May, 2008
Graduated Summa Cum Laude

RESEARCH GRANTS

Department of Energy **Sept. 2019 - Aug. 2022**
Elucidating Grain Growth in Thermomagnetic Processed Materials with Transfer learning and Reinforcement Learning

PI: Amanda Krause, Co-PIs: Joel B. Harley, Michael Tonks
Amount: \$1,200,000, Effort: 1 month per year

Florida Department of Transportation **Feb. 2019 - Jan. 2022**
Phase II: Ultra-High-Performance Concrete (UHPC) Use in Florida Structural Applications
PI: Kyle Riding, Co-PIs: Joel B. Harley, Chris Ferraro, Homer Hamilton
Amount: \$385,051, Effort: 1 month per year

National Science Foundation **Oct. 2018 - Sept. 2020**
EAGER: Real-Time: Ultrasonic Reconstruction and Localization with Deep Helmholtz Networks
PI: Joel B. Harley
Amount: \$273,118, Effort: 1 month per year

Department of Energy **Sept. 2017 - Aug. 2020**
Spread Spectrum Time Domain Reflectometry for String Monitoring in PV Power Plants
PI: Michael Scarpulla, Co-PIs: Joel B. Harley, Cynthia Furse
Amount: \$890,000, Effort: 0.65 months per year

Air Force Young Investigator Award **Mar. 2017 - Feb. 2020**
Predictive, Model-Assisted Guided Wave Structural Health Monitoring
PI: Joel B. Harley
Amount: \$359,979, Effort: 1 month per year

National Science Foundation **Apr. 2016 - Mar. 2020**
Statistical Structural Health Monitoring and Damage Detection for Highly Variable Environments
PI: Joel B. Harley, Co-PI: Daniel O. Adams
Amount: \$325,000, Effort: 1 month per year

University of Utah Seed Grant **Sept. 2016 - Aug. 2017**
Ultrasonic Characterization and Inspection of 3D Printed Metals
 PI: Joel B. Harley
 Amount: \$34,999

Harman International **Feb. 2016 – Jun. 2017**
Hybrid Noise Cancellation Ambient Aware DSP
 PI: Joel B. Harley
 Amount: \$79,100, Effort: 1 month per year

Awards and Honors

National and International Awards and Honors

National Center for Simulation Rehabilitation Research Outstanding Researcher Award	2018
Invited Paper Published in Proceedings of the IEEE	2015
National Defense Science and Engineering Graduate (NDSEG) Fellowship	2009
National Science Foundation (NSF) Graduate Research Fellowship	2009
Dept. of Homeland Security Graduate Fellowship (declined)	2009

University Awards and Honors

Univ. of Utah Best senior clinic award (faculty mentor) [with L-3 Communications]	Apr. 2018
Univ. of Utah Electrical and Computer Engineering Teaching Award	Aug. 2016
Univ. of Utah Best senior clinic award (faculty mentor) [with L-3 Communications]	Apr. 2016
Univ. of Utah Best senior project group award (faculty mentor)	Apr. 2016
Univ. of Utah Career Services Faculty Recognition Award (outstanding advising)	Mar. 2016
Carnegie Mellon A. G. Jordan Award (for academic excellence and service)	May 2014
Carnegie Mellon Lamme/Westinghouse Elec. and Comp. Eng. Grad. Fellowship	Apr. 2009
Tufts University Class of 1942 Scholarship Prize	May 2008
Tufts University Harry Poole Burden Prize in Electrical Engineering	May 2008
Induction into Eta Kappa Nu Electrical Engineering Honor Society	2007
Induction into Tau Beta Pi Engineering Honor Society	2007

Best Student Paper Awards

<i>Proc. of the IEEE Ultrasonics Symposium</i>	Oct. 2011
<i>Proc. of the International Conference on Pipelines and Trenchless Technology</i>	Oct. 2011
<i>Proc. of the ASCE Workshop in Computing</i>	Jun. 2011
<i>Proc. of the Meetings on Acoustics, vol. 6, no. 1</i>	Jun. 2009

RESEARCH & PROFESSIONAL EXPERIENCE

University of Florida, Gainesville, FL USA <i>Affiliate Professor (Dept. of Mechanical and Aerospace Engineering)</i>	Nov. 2018 - present
University of Florida, Gainesville, FL USA <i>Assistant Professor (Dept. of Electrical and Computer Engineering)</i>	Jan. 2018 - present
University of Utah, Salt Lake City, Utah USA <i>Adjunct Professor (Dept. of Electrical and Computer Engineering)</i>	Jan. 2018 - present
University of Utah, Salt Lake City, Utah USA <i>Adjunct Professor (Dept. of Mechanical Engineering)</i>	Mar. 2016 - present
University of Utah, Salt Lake City, Utah USA <i>Assistant Professor (Dept. of Electrical and Computer Engineering)</i>	July 2014 - Dec. 2017
Carnegie Mellon University, Pittsburgh, Pennsylvania USA <i>Graduate Researcher (Dept. of Electrical and Computer Engineering)</i>	Sept. 2008 - May 2014

MIT Lincoln Laboratory, Lincoln, Massachusetts USA
Ranges and Test Beds Intern Nov. 2007 - Aug. 2008

Raytheon Integrated Defense Systems, Sudbury, Massachusetts USA
Engineering Intern May 2007 - Aug. 2007

Tufts University, Medford, Massachusetts USA
Research Assistant (Physics Dept.) Jan. 2006 - Jun. 2008

University of Illinois at Urbana-Champaign, Urbana, Illinois USA
Research Assistant (Electrical and Computer Engineering Dept.) May 2006 - Aug. 2006

LEADERSHIP
EXPERIENCE

IEEE Ultrasonics, Ferroelectrics, and Frequency Control Society
International Ultrasonics Symposium Organizing Committee Member October 2022
Ultrasonics Technical Committee Member Jan. 2016 - present
Student Rep. Advisor and AdCom member Jan. 2015 - present
Student Representative and AdCom member Jan. 2013 - Dec. 2014

Structural Health Monitoring Journal
Associate Editor & Editorial Board Member June 2019 - present

Review of Progress on Quantitative Nondestructive Evaluation
Track Chair, Machine Learning and Statistical Methods July 2019
Track Chair, Machine Learning and Statistical Methods July 2018

IEEE Signal Processing Society
Utah Chapter, President Jan. 2016 - Dec. 2017
Utah Chapter, Treasurer Feb. 2015 - Dec. 2015
Signal Proc. Education Workshop, Awards Chair Aug. 2015

University of Florida
SECME Summer Institute K-12 Teacher Instructor June 2019
Undergraduate Curriculum Committee Member Jan. 2018 - present

University of Utah, Salt Lake City, Utah USA
Eta Kappa Nu Advisor Feb. 2015 - Dec. 2017
Graduate Committee Member Sept. 2014 - Dec. 2017

Carnegie Mellon University, Pittsburgh, Pennsylvania USA
ECE Graduate Student Organization Vice President Sept. 2013 - May 2014
ECE Teaching and Career Seminar Co-organizer May 2013 - Dec. 2013
ECE Graduate Student Organization President Sept. 2012 - Aug. 2013
ECE Graduate Student Organization Vice President Sept. 2011 - Aug. 2012

Acoustical Society of America
Signal Processing in Acoustics Technical Committee Member Jan. 2010 - Dec. 2012

TEACHING
EXPERIENCE

University of Florida, Gainesville, FL USA
Instructor (EEE 5502 / EEL 4750: Foundations of Digital Signal Proc.) Aug. 2019 - Dec. 2019
Instructor (EEL 3135: Introduction to Signals and Systems) Jan. 2019 - May 2019
Instructor (EEE 5502 / EEL 4750: Foundations of Digital Signal Proc.) Aug. 2018 - Dec. 2018

University of Utah, Salt Lake City, Utah USA

<i>Mentor (Senior Clinic with L3 Communications)</i>	Aug. 2017 - Apr. 2018
<i>Mentor (Senior Project)</i>	Aug. 2017 - Apr. 2018
<i>Instructor (ECE 3500: Fundamentals of Signals and Systems)</i>	Aug. 2017 - Dec. 2017
<i>Instructor (ECE 6534: Advanced Digital Signal Processing II)</i>	Jan. 2017 - Apr. 2017
<i>Mentor (Senior Project)</i>	Aug. 2016 - Apr. 2017
<i>Instructor (ECE 3500: Fundamentals of Signals and Systems)</i>	Aug. 2016 - Dec. 2016
<i>Instructor (ECE 6540: Estimation Theory)</i>	Jan. 2016 - Apr. 2016
<i>Mentor (Senior Clinic with L3 Communications)</i>	Aug. 2015 - Apr. 2016
<i>Mentor (Senior Project)</i>	Aug. 2015 - Apr. 2016
<i>Instructor (ECE 3500: Fundamentals of Signals and Systems)</i>	Sept. 2015 - Dec. 2015
<i>Instructor (ECE 6534: Advanced Digital Signal Processing II)</i>	Jan. 2015 - Apr. 2015
<i>Instructor (ECE 3500: Fundamentals of Signals and Systems)</i>	Sept. 2014 - Dec. 2014

Carnegie Mellon University, Pittsburgh, Pennsylvania USA

<i>Teaching Assistant (18-819F: Waves and Applications)</i>	Jan. 2013 - May 2013
<i>Teaching Assistant (18-202: Math. Found. of Electrical Eng.)</i>	Sept. 2011 - Dec. 2011
<i>Eberly Center Future Faculty Program</i>	Jan. 2012 - May 2014
<i>Guest Lecturer (18-290: Signals and Systems)</i>	Nov. 2013
<i>Graduate mentor</i>	May 2011 - Dec. 2011
<i>Graduate mentor</i>	Sept. 2009 - Dec. 2009

PHD STUDENTS

Cody LaFlamme <i>Department of Electrical and Computer Engineering, University of Florida</i>	Aug. 2019 - present
Joseph Melville <i>Department of Electrical and Computer Engineering, University of Florida</i>	Aug. 2019 - present
Ayobami Edun <i>Department of Electrical and Computer Engineering, University of Florida</i>	Nov. 2018 - present
Kang Yang <i>Department of Electrical and Computer Engineering, University of Florida</i>	Aug. 2018 - present
Harsha Vardhan Tetali <i>Department of Electrical and Computer Engineering, University of Florida</i>	Aug. 2018 - present
Ishan Khurjekar <i>Department of Electrical and Computer Engineering, University of Florida</i>	Aug. 2018 - present
Daniel Alabi <i>Department of Electrical and Computer Engineering, University of Florida</i>	May 2018 - present
Yi Tang <i>Department of Electrical and Computer Engineering, University of Utah</i>	Sept. 2016 - present
Soroosh Sabeti <i>Department of Electrical and Computer Engineering, University of Utah</i>	May 2016 - present
Alexander Charles Douglass <i>Department of Mechanical Engineering, University of Utah</i>	May 2015 - Aug. 2019
Kishan Supreet Alguri <i>Department of Electrical and Computer Engineering, University of Utah</i>	Sept. 2014 - Aug. 2019

**MASTER'S
STUDENTS**

Ashesh Pandey <i>Department of Electrical and Computer Engineering, University of Utah</i>	Sept. 2015 - May 2017
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	Pooja Mehta <i>Department of Electrical and Computer Engineering, University of Utah</i>	Jan. 2016 - May 2017
	Spencer Adam Shiveley <i>Department of Electrical and Computer Engineering, University of Utah</i>	Jan. 2016 - May 2017
	Joseph Melville <i>Department of Mechanical Engineering, University of Utah</i>	May 2016 - May 2017
UNDERGRADUATE RESEARCHERS	Alicia Choto Segovia <i>Department of Electrical Engineering, University of South Florida</i>	May 2019 - August 2019
	Angela Cook <i>Department of Electrical and Computer Engineering, University of Florida</i>	Jan. 2019 - May 2019
	Redi Tola <i>Department of Electrical and Computer Engineering, University of Florida</i>	Jan. 2018 - present
	David Garcia <i>Department of Electrical and Computer Engineering, University of Florida</i>	Jan. 2018 - present
	Luoxi Zhang <i>Visiting Chinese Scholar</i>	July 2018 - August 2018
	Cahoyue Sun <i>Visiting Chinese Scholar</i>	July 2018 - August 2018
	Hankun Cao <i>Visiting Chinese Scholar</i>	July 2018 - August 2018
	Carl Herriott <i>Department of Mechanical Engineering, University of Utah</i>	Jan. 2017 - Dec. 2017
	Rajeev Sahay <i>Department of Electrical and Computer Engineering, University of Utah</i>	Sept. 2016 - Dec. 2017
	Yisong Zhang <i>Department of Electrical and Computer Engineering, University of Utah</i>	Jan. 2016 - Dec. 2017
	Nathan Curtis <i>Department of Mechanical Engineering, University of Utah</i>	Sept. 2016 - May 2017
	Ming Gao <i>Department of Electrical and Computer Engineering, University of Utah</i>	Oct. 2014 - May 2016
	Ben Posch <i>Department of Electrical and Computer Engineering, University of Utah</i>	Oct. 2014 - Dec. 2015
	Eric Snyder <i>Department of Electrical and Computer Engineering, University of Utah</i>	Oct. 2014 - May 2015
HIGH SCHOOL RESEARCHERS	Safwan Romdhane <i>University of Florida Student Science Training Program</i>	May 2019 - Aug. 2019
	Vijay Rathore <i>University of Florida Student Science Training Program</i>	Jan. 2019 - Aug. 2019

INVITED TALKS

- P1. **J. B. Harley**, K. Yang, S. Kim, “Physically-Inspired Sparse Signal Processing and Machine Learning for Smart Structures and Materials,” Mitsubishi Electric Research Lab, Boston, MA, August 2018.
- P2. **J. B. Harley**, “Getting More from Less with Sparse Learning: Applications to Modeling Waves,” Air Force Research Lab, Dayton, OH, June 2018.
- P3. **J.B. Harley**, K. Supreet Alguri, “Sparse Signal Processing and Machine Learning for Smart Structures and Materials,” Case Western Reserve University, Cleveland, OH, July 7, 2017.
- P4. **J.B. Harley**, K. Supreet Alguri, “Decomposing Guided Wavefields with Dictionary Learning,” Special Session on Signal Processing in Acoustics: Compressive Sensing in Acoustics, Acoustical Society of America Meeting, Honolulu, HI, Nov. 29, 2016.
- P5. **J.B. Harley**, “Learning and Leveraging Sparse Representations for Waves in Highly Complex Media,” Laboratoire Imagerie Biomédicale (LIB), University Pierre and Marie Curie, Paris, France, Sept. 16, 2016.
- P6. **J.B. Harley**, “University of Utah Collaboration: Project and Experiments,” NASA Marshall, Huntsville, AL, Aug. 2, 2016.
- P7. **J.B. Harley**, “Predicting Complex Wavefields with Few Measurements,” Goethe University of Frankfurt am Main, Frankfurt, Germany, Jun. 27, 2016.
- P8. **J.B. Harley**, “Using Wavenumber Sparsity to Characterize Materials and Locate Structural Damage,” Nondestructive Evaluation Sciences Branch, NASA Langley, Hampton, VA, Jan. 8, 2015.
- P9. **J.B. Harley**, “Signal Processing for Cyber-Physical Civil and Aerospace Infrastructures,” Department of Electrical and Computer Engineering, Northeastern University, Boston, MA, Jan. 24, 2014.
- P10. **J.B. Harley**, “Smarter Sensing for Critical Infrastructures: The Intersection of Physical Principles, Sparse Models, and Statistical Signal Processing,” Department of Electrical and Computer Engineering, Tufts University, Medford, MA, Jan. 21, 2014.
- P11. **J.B. Harley**, “Recovering Dispersion Curves in Guided Wave – A Compressive Sensing Approach,” Department of Structural Engineering, University of California, San Diego, CA, Oct. 16, 2013.

PATENTS

J.B. Harley, J.M.F. Moura, “Temperature Compensation in Wave-Based Damage Detection,” US20140025316A1, filed Jul. 2013, granted July 2019.

PUBLISHED CODE

J.B. Harley, “Sparse Wavenumber Analysis,” MATLAB, Published on Code Ocean, May 2019 DOI: 10.24433/CO.2630229.v1.

J.B. Harley, “Data-Driven Matched Field Processing,” MATLAB, Published on Code Ocean, July 2019 DOI: 10.24433/CO.0906211.v1.

K. S. Alguri, **J.B. Harley**, “K-SVD / Dictionary Learning for Guided Wave Damage Detection,” MATLAB, Published on Code Ocean, July 2019 DOI: 10.24433/CO.2764739.v1.

K. S. Alguri, **J.B. Harley**, “K-SVD / Dictionary Learning for Guided Wave Damage Detection,” MATLAB, Published on Code Ocean, July 2019 DOI: 10.24433/CO.2764739.v1.

S. Sabeti, **J.B. Harley**, “Temporal Sparse Wavenumber Analysis,” MATLAB, Published on Code Ocean, July 2019 DOI: 10.24433/CO.1017684.v1.

S. Sabeti, **J.B. Harley**, “Sparse Wavenumber Recovery and Prediction of Anisotropic Guided Waves in Composites: A Comparative Study,” MATLAB, Published on Code Ocean, November 2019 DOI: 10.24433/CO.5945462.v1.

JOURNAL
PUBLICATIONS

- J1. M.U. Saleh, C. Deline, S. Kingston, N.K.T. Jayakumar, E. Benoit, **J.B. Harley**, C. Furse, M. Scarpulla, ”Detection and Localization of Disconnections in PV Strings Using Spread Spectrum Time Domain Reflectometry,” IEEE Journal of Photovoltaics, in press.
- J2. **J.B. Harley**, M.U. Saleh, S. Kingston, M.A. Scarpulla, C. Furse, “Fast Transient Simulations for Multi-Segment Transmission Lines with a Graphical Model,” Progress in Electromagnetics Research, vol. 165, p. 67-82, 2019. DOI: 10.2528/PIER19042105.
- J3. S. Sabeti, C.A.C. Leckey, L. De Marchi, **J.B. Harley**, “Sparse Wavenumber Recovery and Prediction of Anisotropic Guided Waves in Composites,” IEEE Ultrasonics, Ferroelectrics, and Frequency Control, vol. 66, no. 8, Aug. 2019. DOI: 10.1109/TUFFC.2019.2918746.
- J4. Y. Tang, S. Brown, F. Sorensen, **J.B. Harley**, “Reduced Rank Least Squares Estimation of Mean Arterial Blood Pressure in Septic Patients Receiving Norepinephrine,” IEEE Transactions of Translational Engineering in Health and Medicine, vol. 7, pp.1-9, June 2019. DOI: 10.1109/JTEHM.2019.2919020.
- J5. N. K. T. Jayakumar, E. Benoit, S. Kingston, M. U. Saleh, M. Scarpulla, **J. B. Harley**, C. Furse, “Post-Processing for Improved Accuracy and Resolution of Spread Spectrum Time Domain Reflectometry (SSTDR),” IEEE Sensors Journal, no. 6, vol. 3, June 2019. DOI: 10.1109/LSSENS.2019.2916636.
- J6. M. U. Saleh, J. LaCombe, N. K. T. Jayakumar, S. Kingston, **J. Harley**, C. Furse, M. Scarpulla, “Signal Propagation Through Piecewise Transmission Lines for Interpretation of Reflectometry in Photovoltaic Systems,” IEEE Journal of Photovoltaics, pre-print, Nov. 2018. DOI: 10.1109/JPHOTOV.2018.2884011.
- J7. K.S. Alguri, **J.B. Harley**, “Baseline-Free Guided Wave Damage Detection with Surrogate Data and Dictionary Learning,” Journal of the Acoustical Society of America, vol. 143, no. 6, p. 3807, Jun. 2018. DOI: 10.1121/1.5042240.
- J8. A.C.S. Douglass, **J.B. Harley**, “Dynamic Time Warping Temperature Compensation for Guided Wave Structural Health Monitoring,” IEEE Transactions on Ultrasonics, Ferroelectrics, and Frequency Control, vol. 65, no. 5, pp. 851861, May 2018. DOI: 10.1109/TUFFC.2018.2813278.
- J9. **J.B. Harley**, C. Liu, I.J. Oppenheim, J.M.F Moura, “Managing Complexity, Uncertainty, and Variability in Guided Wave Structural Health Monitoring,” SICE Journal of Control, Measurement, and System Integration, vol. 10, no. 5, pp. 325-336, Oct. 2017. DOI: 10.9746/jcmsi.10.325.

- J10. **J.B. Harley**, C.C. Chia, “Statistical Partial Wavefield Imaging with Lamb Waves,” *Structural Health Monitoring*, vol. 17, no. 4, pp. 919-935, Sept. 2017. DOI: 10.1177/1475921717727160.
- J11. W. Zhao, M. Li, **J.B. Harley**, Y. Jin, J.M.F. Moura, J. Zhu, “Reconstruction of Lamb wave dispersion curves by sparse representation with continuity constraints,” *Journal of the Acoustical Society of America*, vol. 141, no. 2, pp. 749-763, Feb. 2017. DOI: 10.1109/JPROC.2015.2481438.
- J12. **J.B. Harley**, “Predictive Guided Wave Models Through Sparse Modal Representations,” *Proceedings of the IEEE*, vol. 104, no. 8, pp. 1604-1619, Dec. 2015. DOI: 10.1109/JPROC.2015.2481438.
- J13. **J.B. Harley**, J.M.F. Moura, “Data-driven and calibration-free lamb wave source localization with sparse sensor arrays,” *IEEE Transactions on Ultrasonics, Ferroelectrics, and Frequency Control*, vol. 62, no. 8, pp. 1516-1529, Aug. 2015. DOI: 10.1109/TUFFC.2014.006860.
- J14. C. Liu, **J.B. Harley**, M. Bergeś, D.W. Greve, I.J. Oppenheim, “Robust Ultrasonic Damage Detection under Complex Environment using Singular Value Decomposition,” *Ultrasonics*, vol. 58, pp. 75-86, Apr. 2015. DOI: 10.1016/j.ultras.2014.12.005.
- J15. **J.B. Harley**, J.M.F. Moura, “Dispersion curve recovery with orthogonal matching pursuit,” *Journal of the Acoustical Society of America*, vol. 136, no. 6, pp. EL1-EL7, Jan. 2015. DOI: 10.1121/1.4902434.
- J16. **J.B. Harley**, J.M.F. Moura, “Data-Driven Matched Field Processing for Lamb Wave Structural Health Monitoring,” *Journal of the Acoustical Society of America*, vol 135, no. 3, March 2014. DOI: 10.1121/1.4863651
- J17. **J.B. Harley**, J.M.F. Moura, “Sparse Recovery of the Multimodal and Dispersive Characteristics of Lamb Waves,” *Journal of the Acoustical Society of America*, vol. 133, no. 5, pp. 2732-2745, May 2013. DOI: 10.1121/1.4799805
- J18. **J.B. Harley**, J.M.F. Moura, “Scale Transform Signal Processing for Optimal Ultrasonic Temperature Compensation,” *IEEE Transactions on Ultrasonics, Ferroelectrics, and Frequency Control*, vol. 59, no. 10, Oct. 2012. DOI: 10.1109/TUFFC.2012.2448.
- J19. Y. Ying, J.H. Garrett, I.J. Oppenheim, L. Soibelman, **J.B. Harley**, J. Shi, Y. Jin, “Towards Data-Driven Structural Health Monitoring: Application of Machine Learning and Signal Processing to Damage Detection,” *Journal of Computing in Civil Engineering*, vol. 27, no. 6, Sept. 2012. DOI: 10.1061/(ASCE)CP.1943-5487.0000258.
- J20. Y. Ying, J.H. Garrett, **J. Harley**, I.J. Oppenheim, J. Shi, and L. Soibelman, “Damage Detection in Pipes under Changing Environmental Conditions using Embedded Piezoelectric Transducers and Pattern Recognition Techniques,” *Journal of Pipeline Systems Engineering and Practice*, vol. 4, no. 1, Mar. 2012. DOI: 10.1061/(ASCE)PS.1949-1204.0000106.
- JOURNAL PUB.
(IN REVIEW) J21. S. Kim, S. Shiveley, A. C. Douglass, Y. Zhang, D. Adams, **J. B. Harley**, “Efficient Storage and Processing of Large Guided Wave Data Sets with Random Projections,” *Structural Health Monitoring*, in review.
- J22. M. U. Saleh, **J. B. Harley**, N. K. T. Jayakumar, S. Kingston, E. Benoit, M. Scarpulla, C. Furse, “Reflectometry on Asymmetric Transmission Line Systems,” *Progress in Electromagnetics Research*, in review.

- J23. M. U. Saleh, C. Deline, S. Kingston, N. K. T. Jayakumar, E. Benoit, **J. B. Harley**, C. Furse, M. Scarpulla, "Detection and Localization of Disconnections in PV Strings Using Spread Spectrum Time Domain Reflectometry," IEEE Journal of Photovoltaics, in review.
- J24. K. S. Alguri, C. C. Chia, **J. B. Harley**, "Sim-to-Real: Employing Digital Surrogates and Transfer Learning for Ultrasonic Guided Wave Damage Visualization," Ultrasonics, in review.
- J25. A. C. Douglass, D. O. Adams, C. Deemer, **J. B. Harley**, "Noise Robust Guided Wave Damage Detection: A Multi-Measurement Baseline Strategy," Structural Health Monitoring, in review.
- J26. S. Sabeti, **J. B. Harley**, "Undersampled and Time and Space: Recovering Ultrasonic Guided Wavefields," Mechanical Systems and Signal Processing, in review.
- J27. A. C. Douglass, **J. B. Harley**, "Model-Based Statistical Guided Wave Damage Detection: Methodology and Validation," Structural Health Monitoring, in review.
- J28. A. C. Douglass, D. Sparkman, **J. B. Harley**, "Segmentation of Hidden Delaminations with Pitch-Catch Ultrasonic Testing and Agglomerative Clustering," to be submitted to Journal of Nondestructive Evaluation, in review.
- J29. A. Edun, N. K. T. Jayakumar, C. Furse, M. Scarpulla, **J. B. Harley**, "Spread Spectrum Time Domain Reflectometry with Spatially Small Impedances On Asymmetric Transmission Lines," IEEE Transactions on Instrumentation and Measurement, in review.
- J30. Y. Tang, S. Brown, J. Sorensen, **J. B. Harley**, "Physiology-Informed Real-Time Mean Arterial Blood Pressure Learning and Prediction for Sepsis Patients Receiving Norepinephrine," Transactions on Biomedical Engineering, in review.
- J31. S. Kingston, N. K. T. Jayakumar, M. U. Saleh, A. Edun, E. Benoit, R. Sun, C. M. Furse, M. A. Scarpulla, **Joel B. Harley**, "Spread Spectrum Time Domain Reflectometry (SSTDR) and Dictionary Matching to Measure Capacitance for PV cells," to be submitted to IEEE Sensors Journal.
- J32. M. U. Saleh, C. Deline, K. Terwilliger, B. McDanold, E. Benoit, S. Kingston, N. K. T. Jayakumar, A. S. Edun, **J. B. Harley**, C. Furse, M. Scarpulla, "An Overview of Spread Spectrum Time Domain Reflectometry Responses to Photovoltaic Faults," to be submitted to IEEE Journal of Photovoltaics.
- J33. M. U. Saleh, C. Deline, E. Benoit, S. Kingston, **J. B. Harley**, C. Furse, M. Scarpulla, "Detection and Location of Broken Cells and Modules in a System Using Spread Spectrum Time Domain Reflectometry," to be submitted to IEEE Journal of Photovoltaics.
- J34. S. Sabeti, **J. B. Harley**, H. Tetali, K.S. Alguri, "Learning the Multi-Path and Dispersive Properties of Guided Waves with Compressive Sensing," to be submitted to Journal of the Acoustical Society of America.
- J35. K. S. Alguri, **J. B. Harley**, "Baseline-Free Damage Localization in presence of Boundary Reflections using Dictionary Learning Framework," to be submitted to Ultrasonics.
- J36. J. A. Nichols, K. S. Alguri, **J. B. Harley**, "Identifying Biomechanical Wrist Impairments with Machine Learning," to be submitted to Journal of Biomechanics.

JOURNAL PUB.
(IN PREPARATION)

- C1. H. Tetali, K. S. Alguri, **J. B. Harley**, “Beyond Black-box Dictionary Learning for Waves,” Proc. of the Annual Conference on Neural Information Processing Systems, Vancouver, Canada, accepted, December 2019.
- C2. I.D. Khurjekar, **J. B. Harley**, “Accounting for Physics Uncertainty in Ultrasonic Wave Propagation using Deep Learning,” Proc. of the Annual Conference on Neural Information Processing Systems, Vancouver, Canada, accepted, December 2019. ArXiv: 1911.02743v1
- C3. H. Tetali, K. S. Alguri, **J. B. Harley**, “Wave Physics Informed Dictionary Learning in One Dimension,” Proc. of the International Workshop on Machine Learning for Signal Processing, Pittsburgh, PA, accepted, September 2019.
- C4. **J. B. Harley**, S. Sabeti, H. Tetali, K. S. Alguri, “Learning Guided Wave Dispersion Curves in the Presence of Multi-Path Reflections,” Proc. of the International Workshop on Structural Health Monitoring, Stanford, CA, accepted, September 2019.
- C5. E. Benoit, N. K. T. Jayakumar, S. Kingston, M. U. Saleh, M. Scarpulla, **J. B. Harley**, C. Furse, “Applicability of SSTDR Analysis of Complex Loads,” Proc. of the IEEE International Symposium on Antennas and Propagation and USNC-URSI Radio Science Meeting, Atlanta, Georgia, pp. 2087-2088, July 2019.
- C6. I. Khurjekar, **J. B. Harley**, “Deep Neural Network-based Guided Wave Damage Localization,” Proc. of the Review of Quantitative Nondestructive Evaluation, Portland, OR, accepted, July 2019.
- C7. M. U. Saleh, C. Deline, K. Terwilliger, **J. B. Harley**, C. Furse, M. Scarpulla, “Spread Spectrum Time Domain Reflectometry for Detecting Accelerated Degradation in Photovoltaic Cells,” Proc. of the IEEE Photovoltaic Specialists’ Conference, Chicago, IL, in press, June 16-21, 2019.
- C8. M. Roy, K. Walton, **J. B. Harley**, and M. Skliar, “Ultrasonic evaluation of segmental variability in additively manufactured metal components,” Proc. of the IEEE International Ultrasonics Symposium, Kobe, Japan, pp. 1-4, October 2018. DOI: 10.1109/ULTSYM.2018.8579663
- C9. D. Alabi, M. Ramezani, **J. B. Harley**, and R. Tabrizian, “Characterizing Micro- and Nano-Materials based on their Ultrasonic Dispersion Properties: A Feasibility Study,” Proc. of the IEEE International Ultrasonics Symposium, Kobe, Japan, pp. 206-212, October 2018. DOI: 10.1109/ULTSYM.2018.8579809
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