

Kathleen E. Wage

Curriculum Vitae

October 27, 2022

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Citations : [Google Scholar](#)

Education

Massachusetts Institute of Technology/Woods Hole Oceanographic Institution

2000 Ph.D. in Electrical Engineering
1996 E.E. (Electrical Engineer's degree)
1994 S.M. in Electrical Engineering

University of Tennessee, Knoxville, TN

1990 B.S. in Electrical Engineering with Highest Honors and Top Graduate in the College of Engineering

Academic Positions

2022-pres. **Professor with Tenure**, Electrical & Computer Engineering, George Mason University
2006-2022 **Associate Professor with Tenure**, Electrical & Computer Engineering, George Mason University
2000-2006 **Assistant Professor**, Electrical & Computer Engineering, George Mason University
1999-2000 **Visiting Assistant Professor**, Electrical & Computer Engineering, George Mason University

Industrial Positions

1991 **Development Engineer**, Real Time Computer Systems Group, Oak Ridge National Laboratory

Guest Appointments

2017-2018 **Visiting Researcher**, Department of Ocean Engineering, University of Rhode Island
2009-2010 **Visiting Scholar**, Scripps Institution of Oceanography

Awards and Honors

2022 [Rossing Prize in Acoustics Education](#), Acoustical Society of America
2019 [John Touns Presidential Medal for Excellence in Teaching](#), George Mason University
2018 [Best Paper Award](#), EURASIP Journal on Advances in Signal Processing
2016 [Harriett B. Rigas Award](#), IEEE Education Society/Hewlett-Packard
For championing active learning, developing an internationally recognized assessment instrument, and cultivating a sustainable and supportive environment for female engineering faculty
2016 [Teacher of Distinction](#), George Mason University
2014 Senior Member, IEEE
2008 [Mac E. Van Valkenburg Early Career Teaching Award](#), IEEE Education Society
For inspiring classroom instruction and influential leadership in signal processing education research
2005 [Young Investigator Award](#), Office of Naval Research
2004 Outstanding Teaching Award, GMU School of Information Technology & Engineering
2002 Ocean Acoustics Entry-Level Faculty Award, Office of Naval Research
2001 Ralph E. Powe Junior Faculty Enhancement Award, Oak Ridge Associated Universities
1999-2001 Postdoctoral fellowship, Armed Forces Communications and Electronics Association
1997 Promotion to Instructor-G for "demonstrated excellence in teaching," MIT EECS Department
1996 Faculty for the Future Fellowship, GE Fund
1994 Harold L. Hazen Teaching Award, MIT EECS Department
1991-1992 Clare Boothe Luce Fellow and Tau Beta Pi Fellow

Publications

Note: * denotes graduate student working under my supervision or co-supervision at the time of the research.
◊ denotes graduate student not under my supervision. All others co-authors are peer colleagues.

In Press

1. M. A. Hjalmanson, J. K. Nelson, J. R. Buck, and **K. E. Wage**, “Concept images of signals and systems: Bringing together mathematics and engineering,” in *Practice-Oriented Research in Tertiary Mathematics Education*, R. Biehler, M. Liebendörfer, G. Gueudet, C. Rasmussen, and C. Winsløw, Eds., in press (to appear in Nov. 2022), Springer Nature Switzerland AG, 2022.
2. B. Chakrabarti* and **K. E. Wage**, Adaptive Mode Filtering for Arctic Environments, in *OCEANS 2022: Hampton Roads*, in press, Oct. 2022.
3. J. Tucker*, V. Chavali*, **K. E. Wage**, and J. K. Nelson, Multiple Objective Optimization for Fully Adaptive Active Sonar, in *OCEANS 2022: Hampton Roads*, in press, Oct. 2022.

Refereed Journal Articles

1. C. C. Hulbert* and **K. E. Wage**, Random Matrix Theory Predictions of Dominant Mode Rejection Beamformer Performance, *IEEE Open Journal of Signal Processing*, vol. 3, pp. 229–245, Jun. 2022. DOI: [10.1109/OJSP.2022.3185937](https://doi.org/10.1109/OJSP.2022.3185937).
2. M. A. Hjalmanson, J. K. Nelson, L. G. Huettel, **K. E. Wage**, J. R. Buck, and W. T. Padgett, Practices for Implementing Interactive Teaching Development Groups, *ASEE Advances in Engineering Education*, vol. 9, no. 4, pp. 1–24, Oct. 2021. URL.
3. **K. E. Wage**, J. R. Buck, J. K. Nelson, and M. A. Hjalmanson, What Were They Thinking?: Refining Conceptual Assessments Using Think-Aloud Problem Solving, *IEEE Signal Processing Magazine*, vol. 38, no. 3, pp. 85–93, May 2021. DOI: [10.1109/MSP.2021.3060382](https://doi.org/10.1109/MSP.2021.3060382).
4. V. Chavali* and **K. E. Wage**, Cross Term Decay in Multiplicative Processors, *IEEE Signal Processing Letters*, vol. 27, pp. 56–60, 2020. DOI: [10.1109/LSP.2019.2955815](https://doi.org/10.1109/LSP.2019.2955815).
5. V. Chavali*, **K. E. Wage**, and J. R. Buck, Multiplicative and min processing of experimental passive sonar data from thinned arrays, *The Journal of the Acoustical Society of America*, vol. 144, no. 6, pp. 3262–3274, Dec. 2018. DOI: [10.1121/1.5064458](https://doi.org/10.1121/1.5064458).
6. T. Cuprak* and **K. E. Wage**, Efficient Doppler-Compensated Reiterative Minimum Mean-Squared-Error Processing, *IEEE Transactions on Aerospace and Electronic Systems*, vol. 53, no. 2, pp. 562–574, Apr. 2017. DOI: [10.1109/TAES.2017.2651480](https://doi.org/10.1109/TAES.2017.2651480).
7. M. Farrokhrooz*, **K. E. Wage**, P. F. Worcester, and M. A. Dzieciuch, Vertical line array measurements of ambient noise in the North Pacific, *The Journal of the Acoustical Society of America*, vol. 141, no. 3, pp. 1571–1581, Mar. 2017, **Selected as a Technical Area Pick for Underwater Acoustics on the JASA website (Nov. 2017–Jan. 2018)**. DOI: [10.1121/1.4976706](https://doi.org/10.1121/1.4976706).
8. K. Adhikari◊, J. R. Buck, and **K. E. Wage**, Extending Coprime Sensor Arrays to Achieve the Peak Side Lobe Height of a Full Uniform Linear Array, *EURASIP Journal on Advances in Signal Processing*, vol. 2014, no. 148, Sep. 2014, **Received 2018 EURASIP Best Paper Award**. DOI: [10.1186/1687-6180-2014-148](https://doi.org/10.1186/1687-6180-2014-148).
9. **K. E. Wage** and J. R. Buck, Snapshot Performance of the Dominant Mode Rejection Beamformer, *IEEE Journal of Oceanic Engineering*, vol. 39, no. 2, pp. 212–225, Apr. 2014. DOI: [10.1109/JOE.2013.2251538](https://doi.org/10.1109/JOE.2013.2251538).
10. T. K. Chandrayadula*, **K. E. Wage**, P. F. Worcester, M. A. Dzieciuch, J. A. Mercer, R. K. Andrew, and B. M. Howe, Reduced rank models for travel time estimation of low order mode pulses, *The Journal of the Acoustical Society of America*, vol. 134, no. 4, pp. 3332–3346, Oct. 2013. DOI: [10.1121/1.4818847](https://doi.org/10.1121/1.4818847).
11. P. F. Worcester, M. A. Dzieciuch, J. A. Mercer, R. K. Andrew, B. D. Dushaw, A. B. Baggeroer, K. D. Heaney, G. L. D’Spain, J. A. Colosi, R. A. Stephen, J. N. Kemp, B. M. Howe, L. J. Van Uffelen, and **K. E. Wage**, The

- North Pacific Acoustic Laboratory deep-water acoustic propagation experiments in the Philippine Sea, *The Journal of the Acoustical Society of America*, vol. 134, no. 4, pp. 3359–3375, Oct. 2013. DOI: [10.1121/1.4818887](https://doi.org/10.1121/1.4818887).
12. **K. E. Wage**, J. R. Buck, C. H. G. Wright, and T. B. Welch, The Signals and Systems Concept Inventory, *IEEE Transactions on Education*, vol. 48, no. 3, pp. 448–461, Aug. 2005. DOI: [10.1109/TE.2005.849746](https://doi.org/10.1109/TE.2005.849746).
 13. J. R. Buck and **K. E. Wage**, Active and Cooperative Learning in Signal Processing Courses, *IEEE Signal Processing Magazine*, vol. 22, no. 2, pp. 76–81, Mar. 2005. DOI: [10.1109/MSP.2005.1406489](https://doi.org/10.1109/MSP.2005.1406489).
 14. **K. E. Wage**, M. A. Dzieciuch, P. F. Worcester, B. M. Howe, and J. A. Mercer, Mode coherence at megameter ranges in the North Pacific Ocean, *The Journal of the Acoustical Society of America*, vol. 117, no. 3, pp. 1565–1581, Mar. 2005. DOI: [10.1121/1.1854551](https://doi.org/10.1121/1.1854551).
 15. **K. E. Wage**, A. B. Baggeroer, and J. C. Preisig, Modal analysis of broadband receptions in the North Pacific using short-time Fourier techniques, *The Journal of the Acoustical Society of America*, vol. 113, no. 2, pp. 801–817, Feb. 2003. DOI: [10.1121/1.1530615](https://doi.org/10.1121/1.1530615).
 16. J. R. Buck, J. C. Preisig, and **K. E. Wage**, A unified framework for mode filtering and the maximum *a posteriori* mode filter, *The Journal of the Acoustical Society of America*, vol. 103, no. 4, pp. 1813–1824, Apr. 1998. DOI: [10.1121/1.421334](https://doi.org/10.1121/1.421334).

Invited Articles

1. **K. E. Wage**, When Two Wrongs Make a Right: Combining Aliased Arrays to Find Sound Sources, *Acoustics Today*, vol. 14, no. 3, pp. 48–56, 2018. [URL](#).
2. J. R. Buck, **K. E. Wage**, and J. K. Nelson, Designing Active Learning Environments, *Acoustics Today*, vol. 12, no. 2, pp. 12–20, 2016. [URL](#).

Refereed Conference Papers

Review process for these papers required a full paper or an extended summary.

1. B. Chakrabarti* and **K. E. Wage**, Narrowband Acoustic Mode Estimation Using Performance-Weighted Blended Filtering, in *OCEANS 2021: San Diego - Porto*, 2021, pp. 1–6. DOI: [10.23919/OCEANS44145.2021.9705951](https://doi.org/10.23919/OCEANS44145.2021.9705951).
2. C. C. Hulbert* and **K. E. Wage**, Random Matrix Theory Analysis of the Dominant Mode Rejection Beamformer White Noise Gain with Overestimated Rank, in *54th Asilomar Conference on Signals, Systems, and Computers*, Nov. 2020, pp. 490–495. DOI: [10.1109/IEEECONF51394.2020.9443277](https://doi.org/10.1109/IEEECONF51394.2020.9443277).
3. J. A. Diaz-Santos* and **K. E. Wage**, Statistical characterization of the largest DMR-whitened eigenvalue for source enumeration, in *OCEANS 2018 - MTS/IEEE*, Oct. 2018, pp. 1–8. DOI: [10.1109/OCEANS.2018.8604907](https://doi.org/10.1109/OCEANS.2018.8604907).
4. S. Pawlukiewicz* and **K. E. Wage**, Passive coprime split aperture beamforming, in *OCEANS 2018 - MTS/IEEE*, Oct. 2018, pp. 1–7. DOI: [10.1109/OCEANS.2018.8604653](https://doi.org/10.1109/OCEANS.2018.8604653).
5. **K. E. Wage** and J. R. Buck, Experimental Evaluation of a Universal Dominant Mode Rejection Beamformer, in *IEEE Sensor Array and Multichannel Signal Processing Workshop*, Jul. 2018, pp. 119–123. DOI: [10.1109/SAM.2018.8448831](https://doi.org/10.1109/SAM.2018.8448831).
6. J. A. Diaz-Santos* and **K. E. Wage**, Improving whitening filter design using broadband snapshots, in *OCEANS 2016 - MTS/IEEE*, Sep. 2016, pp. 1–7. DOI: [10.1109/OCEANS.2016.7761263](https://doi.org/10.1109/OCEANS.2016.7761263).
7. J. A. Diaz-Santos* and **K. E. Wage**, An improved whitening transformation for snapshot-deficient scenarios, in *OCEANS 2015 - MTS/IEEE*, Oct. 2015, pp. 1–6. DOI: [10.23919/OCEANS.2015.7404410](https://doi.org/10.23919/OCEANS.2015.7404410).
8. M. Farrokhrooz* and **K. E. Wage**, Effect of array tilt on estimates of vertical ambient noise spectrum, in *OCEANS 2015 - MTS/IEEE*, Oct. 2015, pp. 1–6. DOI: [10.23919/OCEANS.2015.7404394](https://doi.org/10.23919/OCEANS.2015.7404394).

9. **K. E. Wage** and J. R. Buck, SINR loss of the Dominant Mode Rejection beamformer, in *International Conf. on Acoustics Speech, and Signal Processing (ICASSP)*, Apr. 2015, pp. 2499–2503. DOI: [10.1109/ICASSP.2015.7178421](https://doi.org/10.1109/ICASSP.2015.7178421).
10. V. Chavali*, **K. E. Wage**, and J. R. Buck, Coprime Processing for the Elba Island Sonar Data Set, in *48th Asilomar Conference on Signals, Systems, and Computers*, Nov. 2014, pp. 1864–1868. DOI: [10.1109/ACSSC.2014.7094791](https://doi.org/10.1109/ACSSC.2014.7094791).
11. M. A. Hjalmanson, J. K. Nelson, L. G. Huettel, W. T. Padgett, **K. E. Wage**, and J. R. Buck, Developing interactive teaching strategies for electrical engineering faculty, in *ASEE Annual Conference*, Session T226, Paper #7292, Jun. 2013, pp. 1–9.
12. K. Adhikari[◊], J. R. Buck., and **K. E. Wage**, Beamforming with extended co-prime sensor arrays, in *International Conf. on Acoustics Speech, and Signal Processing (ICASSP)*, May 2013, pp. 4183–4186. DOI: [10.1109/ICASSP.2013.6638447](https://doi.org/10.1109/ICASSP.2013.6638447).
13. **K. E. Wage** and J. R. Buck, Convergence rate of the Dominant Mode Rejection beamformer for a single interferer, in *International Conf. on Acoustics Speech, and Signal Processing (ICASSP)*, May 2013, pp. 3796–3800. DOI: [10.1109/ICASSP.2013.6638368](https://doi.org/10.1109/ICASSP.2013.6638368).
14. J. R. Buck and **K. E. Wage**, A random matrix theory model for the Dominant Mode Rejection beamformer notch depth, in *IEEE Statistical Signal Processing Workshop*, Aug. 2012, pp. 824–827. DOI: [10.1109/SSP.2012.6319832](https://doi.org/10.1109/SSP.2012.6319832).
15. S. R. Tuladhar[◊], J. R. Buck, and **K. E. Wage**, Approximate eigenvalue distribution of a cylindrically isotropic noise sample covariance matrix, in *IEEE Statistical Signal Processing Workshop*, Aug. 2012, pp. 824–827. DOI: [10.1109/SSP.2012.6319833](https://doi.org/10.1109/SSP.2012.6319833).
16. **K. E. Wage**, J. R. Buck, M. A. Dzieciuch, and P. F. Worcester, Experimental validation of a random matrix theory model for Dominant Mode Rejection beamformer notch depth, in *IEEE Statistical Signal Processing Workshop*, Aug. 2012, pp. 820–823. DOI: [10.1109/SSP.2012.6319830](https://doi.org/10.1109/SSP.2012.6319830).
17. J. K. Nelson, M. A. Hjalmanson, and **K. E. Wage**, Using in-class assessment to inform signals and systems instruction, in *6th IEEE Signal Processing Education Workshop*, Jan. 2011, pp. 192–197. DOI: [10.1109/DSP-SPE.2011.5739210](https://doi.org/10.1109/DSP-SPE.2011.5739210).
18. **K. E. Wage**, J. R. Buck, J. K. Nelson, and M. A. Hjalmanson, Signals and systems assessment: Comparison of responses to multiple choice conceptual questions and open-ended final exam problems, in *6th IEEE Signal Processing Education Workshop*, Jan. 2011, pp. 198–203. DOI: [10.1109/DSP-SPE.2011.5739211](https://doi.org/10.1109/DSP-SPE.2011.5739211).
19. J. K. Nelson, M. A. Hjalmanson, **K. E. Wage**, and J. R. Buck, Students' interpretation of the importance and difficulty of concepts in signals and systems, in *IEEE Frontiers in Education*, Oct. 2010, T3G1–T3G6. DOI: [10.1109/FIE.2010.5673121](https://doi.org/10.1109/FIE.2010.5673121).
20. **K. E. Wage** and J. R. Buck, Performance analysis of dominant mode rejection beamforming, in *International Congress on Acoustics (ICA)*, Aug. 2010, pp. 1–6.
21. J. J. Schwarzwalder* and **K. E. Wage**, ABF performance using covariance matrices derived from spatial spectra for large arrays, in *43rd Asilomar Conference on Signals, Systems, and Computers*, Nov. 2009, pp. 1164–1168. DOI: [10.1109/ACSSC.2009.5470016](https://doi.org/10.1109/ACSSC.2009.5470016).
22. J. R. Buck, **K. E. Wage**, and M. A. Hjalmanson, Item Response Analysis of the Continuous-Time Signals and Systems Concept Inventory, in *5th IEEE Signal Processing Education Workshop*, Jan. 2009, pp. 726–730. DOI: [10.1109/DSP.2009.4786017](https://doi.org/10.1109/DSP.2009.4786017).
23. T. K. Chandrayadula* and **K. E. Wage**, Interpolation methods for vertical linear array element localization, in *OCEANS 2008 - MTS/IEEE*, Aug. 2008, pp. 1–5. DOI: [10.1109/OCEANS.2008.5151910](https://doi.org/10.1109/OCEANS.2008.5151910).
24. **K. E. Wage**, J. R. Buck, and M. A. Hjalmanson, The Signals and Systems Concept Inventory, in *Proceedings of the National STEM Assessment Conference*, 2007, pp. 307–313.

25. J. R. Buck, **K. E. Wage**, M. A. Hjalmarson, and J. K. Nelson, Comparing student understanding of signals and systems using a concept inventory, a traditional exam and interviews, in *IEEE Frontiers in Education*, Milwaukee, WI, Oct. 2007, S1G1–S1G6. DOI: [10.1109/FIE.2007.4418043](https://doi.org/10.1109/FIE.2007.4418043).
26. **K. E. Wage**, J. R. Buck, and M. A. Hjalmarson, Analyzing Misconceptions Using the Signals and Systems Concept Inventory and Student Interviews, in *4th IEEE Signal Processing Education Workshop*, Sep. 2006, pp. 123–128. DOI: [10.1109/DSPWS.2006.265451](https://doi.org/10.1109/DSPWS.2006.265451).
27. T. K. Chandrayadula* and **K. E. Wage**, Mode equalization at megameter ranges, in *OCEANS 2005 - MTS/IEEE*, vol. 2, Sep. 2005, pp. 1242–1248. DOI: [10.1109/OCEANS.2005.1639925](https://doi.org/10.1109/OCEANS.2005.1639925).
28. E. R. St. Pierre* and **K. E. Wage**, Sound speed estimation from sparse environmental measurements with application to mode filtering, in *OCEANS 2005 - MTS/IEEE*, vol. 2, Sep. 2005, pp. 1345–1351. DOI: [10.1109/OCEANS.2005.1639941](https://doi.org/10.1109/OCEANS.2005.1639941).
29. **K. E. Wage**, B. Gallemore, and R. Jeffers, Detection of shallow water low frequency sources using modal peak energy detection, in *13th Annual Adaptive Sensor Array Processing Workshop*, Jun. 2005.
30. **K. E. Wage**, Approximate mode filtering, in *38th Asilomar Conference on Signals, Systems, and Computers*, Nov. 2004, pp. 1436–1440. DOI: [10.1109/ACSSC.2004.1399391](https://doi.org/10.1109/ACSSC.2004.1399391).
31. **K. E. Wage**, J. R. Buck, and C. H. G. Wright, Obstacles in Signals and Systems Conceptual Learning, in *3rd IEEE Signal Processing Education Workshop*, Aug. 2004, pp. 58–62. DOI: [10.1109/DSPWS.2004.1437911](https://doi.org/10.1109/DSPWS.2004.1437911).
32. **K. E. Wage**, A. B. Baggeroer, T. G. Birdsall, M. A. Dzieciuch, B. M. Howe, J. A. Mercer, K. Metzger, W. H. Munk, R. C. Spindel, and P. F. Worcester, A comparative study of mode arrivals at megameter ranges for 28 Hz, 75 Hz, and 84 Hz sources, in *OCEANS 2003 - MTS/IEEE*, Sep. 2003, pp. 258–265. DOI: [10.1109/OCEANS.2003.178566](https://doi.org/10.1109/OCEANS.2003.178566).
33. **K. E. Wage**, J. R. Buck, T. B. Welch, and C. H. G. Wright, Testing and validation of the Signals and Systems Concept Inventory, in *2nd IEEE Signal Processing Education Workshop*, Oct. 2002, pp. 1–6. DOI: [10.1109/DSPWS.2002.1231094](https://doi.org/10.1109/DSPWS.2002.1231094).
34. **K. E. Wage**, J. R. Buck, T. B. Welch, and C. H. G. Wright, The Signals and Systems Concept Inventory, in *ASEE Annual Conference*, Session 1532, Jun. 2002, pp. 1–29.
35. **K. E. Wage**, J. R. Buck, T. B. Welch, and C. H. G. Wright, The continuous-time signals and systems concept inventory, in *International Conf. on Acoustics Speech, and Signal Processing (ICASSP)*, Orlando, Florida, May 2002, pp. 4112–4115. DOI: [10.1109/ICASSP.2002.5745562](https://doi.org/10.1109/ICASSP.2002.5745562).
36. **K. E. Wage**, A. B. Baggeroer, and J. C. Preisig, Modal analysis of broadband acoustic receptions at megameter ranges, in *IEEE Sensor Array and Multichannel Signal Processing Workshop*, Mar. 2000, pp. 102–106. DOI: [10.1109/SAM.2000.877977](https://doi.org/10.1109/SAM.2000.877977).

Invited Conference Papers

1. **K. E. Wage**, Multitaper array processing, in *41st Asilomar Conference on Signals, Systems, and Computers*, Nov. 2007, pp. 1242–1246. DOI: [10.1109/ACSSC.2007.4487424](https://doi.org/10.1109/ACSSC.2007.4487424).
2. K. L. Bell and **K. E. Wage**, Reduced rank space-time adaptive processing with quadratic pattern constraints for airborne radar, in *37th Asilomar Conference on Signals, Systems, and Computers*, Nov. 2003, pp. 807–811. DOI: [10.1109/ACSSC.2003.1292025](https://doi.org/10.1109/ACSSC.2003.1292025).
3. K. L. Bell and **K. E. Wage**, Partially Adaptive LCMV Beamforming With Quadratic Pattern Constraints, in *4th World Multiconf. on Systemic, Cybernetics, and Informatics (SCI 2000)*, vol. VI, Jul. 2000, pp. 213–218.

Workshop and Panel Sessions at IEEE Frontiers in Education Conference

1. J. R. Buck, **K. E. Wage**, and M. A. Hjalmarson, Workshop - The Signals and Systems Concept Inventory, in *IEEE Frontiers in Education*, Oct. 2008, W3A–1. DOI: [10.1109/FIE.2008.4720545](https://doi.org/10.1109/FIE.2008.4720545).

2. D. Evans, G. Gray, S. Krause, J. Martin, C. Midkiff, B. Notaros, M. Pavelich, D. Rancour, T. Reed-Rhoads, R. Streveler, and **K. E. Wage**, Progress on concept inventory assessment tools, in *IEEE Frontiers in Education*, Nov. 2003, T4G1–T4G8. DOI: [10.1109/FIE.2003.1263392](https://doi.org/10.1109/FIE.2003.1263392).
3. D. Evans, C. Midkiff, R. Miller, J. Morgan, S. Krause, B. Notaros, D. Rancour, and **K. E. Wage**, Tools for analyzing conceptual understanding in the engineering sciences, in *IEEE Frontiers in Education*, Nov. 2002, F2B–1. DOI: [10.1109/FIE.2002.1158151](https://doi.org/10.1109/FIE.2002.1158151).

Proceedings of Meetings on Acoustics

Proceedings of Meetings on Acoustics is an editor-reviewed, open-access, online journal published by the Acoustical Society of America. Articles originate as talks presented at semiannual ASA meetings or at other cosponsored meetings, and may be submitted after the meeting. The article date indicates the meeting date; the publication date is listed separately (if different).

1. J. B. Tucker* and **K. E. Wage**, Performance weighted blending of nested array processors, in *Proceedings of Meetings on Acoustics*, published Aug. 2020, vol. 36, 2019, pp. 1–10. DOI: [10.1121/2.0001287](https://doi.org/10.1121/2.0001287).
2. I. M. Rooney[◊], J. R. Buck, and **K. E. Wage**, Implementing physical constraints for noise only normal mode shape estimation, in *Proceedings of Meetings on Acoustics*, vol. 19, 2013, pp. 1–8. DOI: [10.1121/1.4801396](https://doi.org/10.1121/1.4801396).
3. **K. E. Wage**, M. Farrokhrooz, M. A. Dzieciuch, and P. F. Worcester, Analysis of the vertical structure of deep ocean noise using measurements from the SPICEX and PhilSea experiments, in *Proceedings of Meetings on Acoustics*, vol. 19, 2013, pp. 1–5. DOI: [10.1121/1.4800718](https://doi.org/10.1121/1.4800718).

Conference Proceedings

Review process for these papers required only the abstract.

1. L. J. Van Uffelen and **K. E. Wage**, Modeling acoustic scattering by internal waves using random matrix theory, in *Conference on Acoustic and Environmental Variability, Fluctuations and Coherence*, vol. 38(3), Institute of Acoustics, Dec. 2016, pp. 27–34. [URL](#).
2. M. A. Hjalmarson, **K. E. Wage**, and J. R. Buck, Translating information from graphs into graphs: Signals processing, in *Proceedings of the 11th Annual Conference on Research in Undergraduate Mathematics Education*, Mar. 2008, pp. 1–16. [URL](#).

Conference Abstracts

The Acoustical Society of America publishes abstracts for its semiannual meetings in JASA. The IEEE Underwater Acoustic Signal Processing Workshop publishes a book of abstracts. The IEEE Frontiers in Education Conference publishes “works-in-progress” abstracts.

1. J. B. Tucker*, **K. E. Wage**, and J. R. Buck, Performance Weighted Blended Power Spectral Density Estimation, in *IEEE Underwater Acoustic Signal Processing Workshop*, Oct. 2021.
2. J. A. Diaz-Santos[†] and **K. E. Wage**, Whitening and source enumeration for large underwater arrays, *The Journal of the Acoustical Society of America*, vol. 148, no. 4, p. 2477, Oct. 2020. DOI: [10.1121/1.5146862](https://doi.org/10.1121/1.5146862).
3. C. Hulbert* and **K. E. Wage**, Random matrix theory analysis of the dominant mode rejection beamformer white noise gain, *The Journal of the Acoustical Society of America*, vol. 148, no. 4, p. 2477, Oct. 2020. DOI: [10.1121/1.5146863](https://doi.org/10.1121/1.5146863).
4. J. Tucker*, **K. E. Wage**, and L. Van Uffelen, Performance weighted blended spectral estimation on experimental seaglider data, *The Journal of the Acoustical Society of America*, vol. 148, no. 4, p. 2545, Oct. 2020. DOI: [10.1121/1.5147066](https://doi.org/10.1121/1.5147066).
5. J. B. Tucker*, **K. E. Wage**, and J. R. Buck, Performance weighted blended power spectrum estimation, in *IEEE Underwater Acoustic Signal Processing Workshop*, Oct. 2019.

6. **K. E. Wage**, Estimating frequency-wavenumber spectra using a universal dominant mode rejection processor, in *IEEE Underwater Acoustic Signal Processing Workshop*, Oct. 2019.
7. **K. E. Wage**, Frequency-wavenumber spectrum estimation using blended dominant mode rejection beamforming, *The Journal of the Acoustical Society of America*, vol. 146, no. 4, p. 3057, Oct. 2019. DOI: [10.1121/1.5137607](https://doi.org/10.1121/1.5137607).
8. V. Chavali* and **K. E. Wage**, Statistical characterization of cross terms in snapshot-averaged multiplicative processors, *The Journal of the Acoustical Society of America*, vol. 145, no. 3, p. 1733, Mar. 2019, **Received Best Young Presenter Award from ASA's Signal Processing Technical Committee**. DOI: [10.1121/1.5101362](https://doi.org/10.1121/1.5101362).
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47. **K. E. Wage** and J. R. Buck, Development of the Signals and Systems Concept Inventory (SSCI) Assessment Instrument, in *IEEE Frontiers in Education*, Oct. 2001, F2A–2. DOI: [10.1109/FIE.2001.963690](https://doi.org/10.1109/FIE.2001.963690).
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Invited Conference Abstracts

The Acoustical Society of America publishes abstracts for its semiannual meetings in JASA.

1. J. R. Buck and **K. E. Wage**, Interpreting the environmental information embodied in universal adaptive beamformers, *The Journal of the Acoustical Society of America*, vol. 148, no. 4, p. 2545, Oct. 2020. DOI: [10.1121/1.5147065](https://doi.org/10.1121/1.5147065).
2. J. R. Buck and **K. E. Wage**, Measuring students' learning gains with pre/post assessment, *The Journal of the Acoustical Society of America*, vol. 144, no. 3, p. 1785, Sep. 2018. DOI: [10.1121/1.5067885](https://doi.org/10.1121/1.5067885).
3. **K. E. Wage**, DJ Prof: Mixing instructional modes to improve student learning, *The Journal of the Acoustical Society of America*, vol. 144, no. 3, p. 1858, Sep. 2018. DOI: [10.1121/1.5068174](https://doi.org/10.1121/1.5068174).
4. V. Chavali* and **K. E. Wage**, Comparison of multiplicative and min processors for coprime and nested geometries using the Elba Island data set, *The Journal of the Acoustical Society of America*, vol. 141, no. 5, p. 3843, May 2017. DOI: [10.1121/1.4988561](https://doi.org/10.1121/1.4988561).

5. **K. E. Wage**, Application of random matrix theory to acoustic modeling and signal processing, *The Journal of the Acoustical Society of America*, vol. 138, no. 3, p. 1840, Sep. 2015. DOI: [10.1121/1.4933856](https://doi.org/10.1121/1.4933856).
6. L. J. Van Uffelen and **K. E. Wage**, Able sea chicks: Adventures in acoustical oceanography, *The Journal of the Acoustical Society of America*, vol. 135, no. 4, p. 2299, Apr. 2014. DOI: [10.1121/1.4877961](https://doi.org/10.1121/1.4877961).
7. J. R. Buck and **K. E. Wage**, Modeling dominant mode rejection beamformer notch depth using random matrix theory, *The Journal of the Acoustical Society of America*, vol. 130, no. 4, p. 2377, Oct. 2011. DOI: [10.1121/1.3654528](https://doi.org/10.1121/1.3654528).
8. **K. E. Wage**, J. R. Buck, M. A. Dzieciuch, and P. F. Worcester, Dominant mode rejection beamformer notch depth: Theory versus experiment, *The Journal of the Acoustical Society of America*, vol. 130, no. 4, p. 2377, Oct. 2011. DOI: [10.1121/1.3654529](https://doi.org/10.1121/1.3654529).
9. **K. E. Wage**, Application of multitaper methods to passive sonar, *The Journal of the Acoustical Society of America*, vol. 121, no. 5, p. 3172, May 2007. DOI: [10.1121/1.4782299](https://doi.org/10.1121/1.4782299).
10. **K. E. Wage**, Experimental measurements of normal-mode statistics at megameter ranges, *The Journal of the Acoustical Society of America*, vol. 116, no. 4, p. 2608, Oct. 2004. DOI: [10.1121/1.4785401](https://doi.org/10.1121/1.4785401).

Webinars and Online Workshop Presentations

Recorded presentations available to the public.

1. **K. E. Wage**, J. Tucker*, J. R. Buck, and L. J. V. Uffelen, Autonomous computationally efficient power spectral density estimation using performance-weighted blending, in *International Quiet Ocean Experiment (IQOE) Workshop on Low-Cost, Self-contained Underwater Acoustic Recording Systems*, Dec. 2021. [URL](#).

Theses

1. **K. E. Wage**, “Broadband modal coherence and beamforming at megameter ranges,” Ph.D. dissertation, Massachusetts Institute of Technology/Woods Hole Oceanographic Institution, 2000. [URL](#).
2. **K. E. Wage**, “Adaptive estimation of acoustic normal modes,” M.S. thesis, Massachusetts Institute of Technology/Woods Hole Oceanographic Institution, 1994. [URL](#).

Other Research Products

Signals and Systems Concept Inventory (SSCI) Assessment Instrument

Developers: K. E. Wage (George Mason University) and J. R. Buck (University of Massachusetts Dartmouth)

Website: <http://signals-and-systems.org>

The Signals and Systems Concept Inventory (SSCI) is a 25 question multiple-choice exam designed to assess students’ understanding of core concepts taught in undergraduate linear signals and systems courses. The National Science Foundation funded the SSCI project, first through a grant to the Foundation Coalition and later through the Assessment of Student Achievement program. The SSCI is used both in the US and overseas for formative assessment and accreditation. To date at least 30 instructors have given the SSCI to more than 2593 students. In 2007 the developers collaborated with Professor Luis Vicente at the Universidad of Zaragoza in Spain to produce a Spanish translation of the SSCI. The 2005 paper describing the initial version of the SSCI has been [cited 175 times](#) (as of 7/12/2021). Freeman et al. cited SSCI data in their meta-analysis of 225 studies of STEM courses published in Proceedings of the National Academy of Sciences ([article](#), [supplemental material containing SSCI citation](#)). The [2021 paper by Wage et al.](#) in *IEEE Signal Processing Magazine* presents updated SSCI results demonstrating that active learning courses produce larger gains in students’ conceptual understanding than traditional lecture courses.

Research Funding

While at Mason Kathleen Wage has obtained \$4,549,465 in research funding. Her share of this funding is \$4,472,513. Since earning tenure in 2006, she obtained \$3,207,295 in funding and her share of this funding is

\$3,207,295. She is the PI for all the grants below. The only grant with a co-PI is *The Signals and Systems Concept Inventory (refinement, validation, and dissemination)* award from NSF in 2005. The following list is in the format required by Volgenau School of Engineering guidelines for a Promotion CV. Total expenditures are as of June 25, 2021.

1. *Random Matrix Theory Analysis of Adaptive Beamformers*
Sponsor: Office of Naval Research Undersea Signal Processing Program
Award Number: N00014-18-1-2669
Duration: 7/1/18-12/31/21
PI: K. E. Wage
Mason amount: \$571,994 K. E. Wage share: \$571,994 Total expenditures: \$468,611
As of June 2021, Mason has received \$523,000. Final grant increment expected in Fall 2021.
2. *Co-Prime Sensor Array Signal Processing*
Sponsor: Office of Naval Research Basic Research Challenge Program
Award Number: N00014-17-1-2734
Duration: 8/1/17-3/31/19
PI: K. E. Wage
Mason amount: \$150,000 K. E. Wage share: \$150,000 Total expenditures: \$150,000
Final increment of 2013 BRC project was provided through a separate grant.
3. *Partial Underwriting: 2017 IEEE Underwater Acoustic Signal Processing Workshop*
Sponsor: Office of Naval Research Undersea Signal Processing Program
Award Number: N00014-17-1-2377
Duration: 4/1/17-2/28/18
PI: K. E. Wage
Mason amount: \$7,711 K. E. Wage share: \$7,711 Total expenditures: \$7,711
4. *Partial Underwriting: 2015 IEEE Underwater Acoustic Signal Processing Workshop*
Sponsor: Office of Naval Research Undersea Signal Processing Program
Award Number: N00014-15-1-2749
Duration: 8/1/15-2/29/16
PI: K. E. Wage
Mason amount: \$6,930 K. E. Wage share: \$6,930 Total expenditures: \$6,820
5. *Adaptive Beamforming and Random Matrix Theory*
Sponsor: Office of Naval Research Undersea Signal Processing Program
Award Number: N00014-15-1-2201
Duration: 4/1/15-3/31/19
PI: K. E. Wage
Mason amount: \$338,918 K. E. Wage share: \$338,918 Total expenditures: \$338,227
6. *Deep Water Acoustic Scattering and Noise*
Sponsor: Office of Naval Research Ocean Acoustics Program
Award Number: N00014-15-1-2063
Duration: 3/1/15-12/31/18
PI: K. E. Wage
Mason amount: \$298,169 K. E. Wage share: \$298,169 Total expenditures: \$298,169
7. *Partial Underwriting: 2013 IEEE Underwater Acoustic Signal Processing Workshop*
Sponsor: Office of Naval Research Undersea Signal Processing Program
Award Number: N00014-14-1-0067
Duration: 12/1/13-9/30/14
PI: K. E. Wage
Mason amount: \$6,300 K. E. Wage share: \$6,300 Total expenditures: \$6,249

8. *Co-Prime Sensor Array Signal Processing*
Sponsor: Office of Naval Research Basic Research Challenge Program
Award Number: N00014-13-1-0229
Duration: 1/1/13-9/30/17
PI: K. E. Wage
Mason amount: \$578,287 K. E. Wage share: \$578,287 Total expenditures: \$578,267
9. *Deep Water Ambient Noise and Mode Processing*
Sponsor: Office of Naval Research Ocean Acoustics Program
Award Number: N00014-12-1-0412
Duration: 3/15/12-2/28/15
PI: K. E. Wage
Mason amount: \$225,111 K. E. Wage share: \$225,111 Total expenditures: \$225,111
10. *Random Matrix Theory for Adaptive Beamforming*
Sponsor: Office of Naval Research Undersea Signal Processing Program
Award Number: N00014-12-1-0048
Duration: 1/1/12-1/31/15
PI: K. E. Wage
Mason amount: \$330,232 K. E. Wage share: \$330,232 Total expenditures: \$330,155
11. *Tomography of the Ocean Underneath an Ice Shelf*
Sponsor: Scitor Corporation via subcontract from University of California San Diego
Award Number: UCSD-05-D-0302
Duration: 10/1/10-12/31/11
PI: K. E. Wage
Mason amount: \$40,781 K. E. Wage share: \$40,781 Total expenditures: \$40,780
12. *Mode Processing and Tomography for the Philippine Sea Experiment*
Sponsor: Office of Naval Research Ocean Acoustics Program
Award Number: N00014-09-1-0675
Duration: 3/1/09-3/31/12
PI: K. E. Wage
Mason amount: \$273,142 K. E. Wage share: \$273,142 Total expenditures: \$273,141
13. *Stochastic Eigen-Analysis for Adaptive Array Processing*
Sponsor: Office of Naval Research Undersea Signal Processing Program
Award Number: N00014-09-1-0114
Duration: 1/1/09-3/31/12
PI: K. E. Wage
Mason amount: \$289,720 K. E. Wage share: \$289,720 Total expenditures: \$289,719
14. *Shallow Water Beamformer Option*
Sponsor: Navy STTR Program (Topic N04-T011) via subcontract from 3 Phoenix, LLC
Award Number: 06-3006-GMU
Duration: 12/11/08-9/29/09
PI: K. E. Wage
Mason amount: \$90,000 K. E. Wage share: \$90,000 Total expenditures: \$89,663
15. *Shallow Water Beamformer Phase II*
Sponsor: Navy STTR Program (Topic N04-T011) via subcontract from 3 Phoenix, LLC
Award Number: 06-3006-GMU
Duration: 3/1/06-3/31/08
PI: K. E. Wage
Mason amount: \$221,378 K. E. Wage share: \$221,378 Total expenditures: \$221,128

16. *ONR Graduate Traineeship Award for Tarun K. Chandrayadula*
Sponsor: Office of Naval Research Ocean Acoustics Program
Award Number: N00014-06-1-0223
Duration: 1/1/06-12/31/09
PI: K. E. Wage
Mason amount: \$194,244 K. E. Wage share: \$194,244 Total expenditures: \$194,234
17. *The Signals and Systems Concept Inventory (refinement, validation, and dissemination)*
Sponsor: National Science Foundation
Award Number: NSF DUE-0512686
Duration: 9/15/05-8/31/10
PI: K. E. Wage
Mason amount: \$153,904 K. E. Wage share: \$76,952 Total expenditures: \$153,902
Co-PI: Margret A. Hjalmarson (CEHD); Collaborative project with John R. Buck (UMassDartmouth) who was funded by separate grant (NSF DUE-0512430)
18. *Design of Robust Adaptive Array Processors for Non-Stationary Ocean Environments*
Sponsor: Office of Naval Research Young Investigator Program
Award Number: N00014-05-1-0639
Duration: 6/1/05-9/30/08
PI: K. E. Wage
Mason amount: \$309,961 K. E. Wage share: \$309,961 Total expenditures: \$309,429
19. *Shallow Water Beamformer Phase I + Option*
Sponsor: Navy STTR Program (Topic N04-T011) via subcontract from 3 Phoenix, LLC
Award Number: 04-3002-GMU
Duration: 7/1/04-7/31/05
PI: K. E. Wage
Mason amount: \$28,791 K. E. Wage share: \$28,791 Total expenditures: \$22,279
20. *Signals and Systems Concept Inventory*
Sponsor: National Science Foundation via subcontract from the Texas Engineering Experiment Station
Award Number: NSF EEC 9802942
Duration: 10/1/02-9/30/03
PI: K. E. Wage
Mason amount: \$17,399 K. E. Wage share: \$17,399 Total expenditures: \$17,384
21. *Stochastic Models and Robust Estimation for Broadband Acoustic Mode Signals*
Sponsor: Office of Naval Research Ocean Acoustics Program: Entry-Level Faculty Award
Award Number: N00014-02-1-0416
Duration: 4/1/02-12/31/05
PI: K. E. Wage
Mason amount: \$300,655 K. E. Wage share: \$300,655 Total expenditures: \$300,655
22. *A Linear Systems Concepts Exam*
Sponsor: National Science Foundation via subcontract from University of Massachusetts Dartmouth
Award Number: NSF EEC 9802942
Duration: 10/1/01-9/30/02
PI: K. E. Wage
Mason amount: \$17,722 K. E. Wage share: \$17,722 Total expenditures: \$16,994
23. *ORAU - Ralph E. Powe Junior Faculty Enhancement Award*
Sponsor: Oak Ridge Associated Universities
Duration: 7/1/01-6/30/02
PI: K. E. Wage
Mason amount: \$5,000 K. E. Wage share: \$5,000 Total expenditures: \$5,000

24. *Robust Matched Field Processing and Ambient Environmental Characterization*

Sponsor: Lockheed Martin Integrated Systems

Award Number: LM/TO 322381

Duration: 4/27/01-6/30/02

PI: K. E. Wage

Mason amount: \$79,986 K. E. Wage share: \$79,986 Total expenditures: \$77,209

25. *A Linear Systems Concepts Exam*

Sponsor: National Science Foundation via subcontract from University of Massachusetts Dartmouth

Award Number: NSF EEC 9802942

Duration: 3/14/01-9/30/01

PI: K. E. Wage

Mason amount: \$13,130 K. E. Wage share: \$13,130 Total expenditures: \$11,385

Research Spending: Expenditures, GRA support, PI salary

The following table summarizes Kathleen Wage's research spending per year since fiscal year 2002. The table includes expenditures, graduate research assistants (GRAs) supported by grants, and the fraction of Prof. Wage's academic year salary (AY) covered by grants. 1 FTE corresponds to 9 months of AY salary. Summer salary is not included in this table.

Since FY 2007 (tenure) Kathleen Wage has averaged \$257,656 in expenditures per year and supported an average of 2.51 graduate students each year. She paid an average of 0.29 FTE of her AY salary each year from research grants. Over this period, her grants paid for a total of 4.39 out of 15 years.

| Research Spending: FY 2002-present | | Expenditures as of 6/4/2021 | | |
|------------------------------------|---------------------------|--------------------------------|--------------------------|-----------------------|
| Fiscal Year | Expenditures (dollars) | AY GRA (full-time students) | Summer GRA (students) | PI AY salary (FTE) |
| 2021 | \$156,894 | 1.50 | 2.00 | 0.15 |
| 2020 | \$186,578 | 2.00 | 2.00 | 0.12 |
| 2019 | \$162,014 | 2.12 | 3.00 | 0.10 |
| 2018 | \$391,078 | 2.50 | 2.00 | 0.50 |
| 2017 | \$348,589 | 3.00 | 4.00 | 0.30 |
| 2016 | \$230,787 | 2.75 | 4.00 | 0.00 |
| 2015 | \$366,986 | 4.00 | 3.00 | 0.33 |
| 2014 | \$311,232 | 4.00 | 3.00 | 0.26 |
| 2013 | \$203,668 | 2.50 | 2.00 | 0.28 |
| 2012 | \$167,776 | 2.00 | 2.00 | 0.16 |
| 2011 | \$249,678 | 2.00 | 1.00 | 0.54 |
| 2010 | \$283,432 | 1.38 | 2.00 | 0.56 |
| 2009 | \$223,304 | 1.50 | 2.00 | 0.33 |
| 2008 | \$284,864 | 3.12 | 4.00 | 0.33 |
| 2007 | \$297,953 | 3.29 | 2.33 | 0.44 |
| 2006 | \$134,104 | 1.27 | 2.00 | 0.13 |
| 2005 | \$73,867 | 0.75 | 2.00 | 0.15 |
| 2004 | \$131,524 | 2.00 | 2.00 | 0.28 |
| 2003 | \$121,066 | 0.50 | 0.00 | 0.11 |
| 2002 | \$98,944 | 1.00 | 1.00 | 0.00 |
| Total | \$4,424,337 | 43.19 | 45.33 | 5.05 |
| Total after tenure | \$3,864,833 | 37.66 | 38.33 | 4.39 |

Continued on next page

| Research Spending: FY 2002-present | | Expenditures as of 6/4/2021 | | |
|------------------------------------|---------------------------|--------------------------------|--------------------------|-----------------------|
| Fiscal Year | Expenditures (dollars) | AY GRA (full-time students) | Summer GRA (students) | PI AY salary (FTE) |
| Avg per yr after tenure | \$257,656 | 2.51 | 2.56 | 0.29 |

Other Research Activities

Oceanographic Field Work

- PhilSea10 Recovery Cruise, March 24-April 16, 2011 (Chief Scientist: Peter Worcester)
- PhilSea10 Deployment Cruise, April 6 – April 28, 2010 (Chief Scientist: Peter Worcester)
- PhilSea09 Deployment Cruise, March 31 – April 10, 2009 (Chief Scientist: Peter Worcester)
- SPICE Recovery Cruise, June 6 – June 26, 2005 (Chief Scientist: Peter Worcester)
- SPICE Deployment Cruise, May 26 – June 18, 2004 (Chief Scientist: Peter Worcester)
- North Pacific Acoustic Laboratory Deployment Cruise, July 6-July 18, 1998 (Chief Scientist: Peter Worcester)

Seminars (Selected)

- Kongsberg Maritime Signal Processing Seminar, Horten, Norway, March 2020
- Applied Research Laboratories Seminar, University of Texas at Austin, August 2019
- Johns Hopkins University Applied Physics Laboratory Seminar, July 2019
- University of Rhode Island Ocean Engineering Seminar, February 2018
- Naval Surface Warfare Center Dahlgren Division Distinguished Lecture, March 2015
- ECE Department Seminar, University of Massachusetts Dartmouth, November 2013
- NEAR Lab Research Seminar, Portland State University, May 2013
- ECE Department Seminar, Portland State University, May 2013
- Naval Research Laboratory Seminar, February 2012
- Frontiers of Engineering Education presentation at National Academy of Engineering, November 2010.
- Invited talk at National Taiwan University, May 2010.

Student Supervision

Current Doctoral Students

1. B. Chakrabarti, passed qualifying exams in 2019.
2. V. Chavali, advanced to candidacy in June 2021.
3. G. R. Gatling, advanced to candidacy in January 2021.
4. C. Hulbert, advanced to candidacy in April 2020.
5. J. B. Tucker, passed qualifying exams in January 2021.

Doctoral Dissertations Supervised

1. J. A. Diaz-Santos, “Colored Noise Whitening and Source Enumeration in High Dimension, Low Sample Size Scenarios,” Ph.D. dissertation, George Mason University, 2020.
2. M. Farrokhrooz, “Deep Ocean Ambient Noise Analysis and Modeling for SPICEX,” Ph.D. dissertation, George Mason University, 2017.
3. J. J. Schwarzwalder, “Structured Covariance Estimation From Spatial Spectra For Adaptive Beamforming,” Ph.D. dissertation, George Mason University, 2010. [URL](#).
4. T. K. Chandrayadula, “Mode Tomography Using Signals From the Long Range Ocean Acoustic Propagation Experiment (LOAPEX),” Ph.D. dissertation, George Mason University, 2009. [URL](#).

Master’s Theses Supervised

1. R. Alaghbar, “Adaptive Covariance Estimation Using Spectral Clustering,” M.S. thesis, George Mason University, 2020.
2. J. B. Tucker, “Performance Weighted Blended Power Spectrum Estimation,” M.S. thesis, George Mason University, 2020.
3. V. Chavali, “Coprime and Nested Array Processing of the Elba Island Sonar Data Set,” M.S. thesis, George Mason University, 2017. DOI: [10.13021/G8JX0W](https://doi.org/10.13021/G8JX0W).

4. S. K. Kamaraju, "Analysis of Random Matrix Theory Model for Dominant Mode Rejection Beamformer Notch Depth in PhilSea10," M.S. thesis, George Mason University, 2016. DOI: [10.13021/G8ZH5C](https://doi.org/10.13021/G8ZH5C).
5. Le, Thuykhanh, "Least Squares Estimation of Missing Sample for Oversampled Array," M.S. thesis, George Mason University, 2016. DOI: [10.13021/G8CH6G](https://doi.org/10.13021/G8CH6G).
6. M. Bojja, "Comparison of Notch Depth for Constrained Least Mean Squares and Dominant Mode Rejection Beamformers," M.S. thesis, George Mason University, 2015. [URL](#).
7. T. Cuprak, "Application of the Reiterative MMSE Algorithm to Underwater Acoustics Using Covariance Matrix Tapers," M.S. thesis, George Mason University, 2013. [URL](#).
8. K. A. Al Muhanna, "Acoustic Modeshape Inversion Using Deep Water Ambient Noise Measurements," M.S. thesis, George Mason University, 2008. [URL](#).
9. R. Wheelock, "Measurement of Angular Spread of Signals in SWellEx-96 Using Multitaper Array Processing," M.S. thesis, George Mason University, 2008. [URL](#).
10. R. Vaillant, "Detection of Ultra-Wide Bandwidth Impulse Signals Using an Acousto-Optic Device and the Short-Time Fourier Transform," M.S. thesis, George Mason University, 2003.

Senior Design Projects (ECE 492/493) Supervised

1. L. Araki, R. Eid, Y. Jeza, S. Meruvia, M. Patel, and R. Urena, "Radar Cantenna," Fall 2016/Spring 2017, project sponsored by Adaptive Methods.
2. B. McCall, P. Patel, R. Shah, A. Toughiry, and J. Williams, "ASTRA: Active Shooter Tactical Response Assistant," co-advised with K. Hintz, Fall 2016/Spring 2017.
Project won the ECE Best Senior Design Project Award.
3. Rony Alaghbar, Kelly Byrnes, Jacob Cohen, "Audio-Visual Active Locator," Fall 2013/Spring 2014
Project won ECE Best Senior Design Project Award
4. Kevin DeSilva, Shafa Ahmed, "Acoustic Localization," Fall 2010/Spring 2011
5. Allen J. Zechini, Reem M. Elbasuony, Farnaz Sedghi, Thuan H. Nguyen, "Software Defined Radio with Smart Antenna," Fall 2008/Spring 2009
6. Matthew Carrick, Andrew Do, Diego Torrico, Trong Nguyen, "Hydro Acoustic Thermometer," Spring 2006/Fall 2006
7. Richard Thompson, Hicham Foud, Pegeman Karimi, Edgar Guerra-Erazo, "RF Alertness System," Fall 2005/Spring 2006
8. Daniel Murray, Mike Katrivanos, Egor Gurovich, "Digital Portable Amplifier," Spring 2005/Fall 2005
9. Usman Zafar and Muneeb Adam, "Signal Processing Analysis for Communication Over Power Lines in High SNR Environments," Spring 2004/Fall 2004
10. Danielle Obuchon, "Drift Inversion Estimation of Multipath Ghosts in SAR Image Reconstruction," Spring 2004
11. James Hensley, Tom Krappweis, Luis Martinez, Kelia Nichols, "Multi-Element Impact/Splash Sensor," Fall 2003/Spring 2004.
12. Liang Cheng, Tamer Naim, Allen Santora, Kar Tam, "A DSP Spectrum Analyzer for the PC," Spring 2003/Fall 2003
13. Geoff Hamshar and Richard Wheelock, "Computerized High-Frequency Tuner," Spring 2002/Fall 2002
14. Erika Kwon, Marc Sepantaie, Lamya Yadullah, "Isolated Command Recognition," Spring 2002
15. Jaclyn Gemmel, Sherin Aminifar, and Joseph Duffy, "Digital Beamforming Using Dolph-Chebyshev Linear Array Synthesis," Fall 2001/Spring 2002
16. Ekwuluo Ikonke and Sean Grier, "Detectability of Acoustic Signals in Varying Ocean Environments," Spring 2001/Fall 2001
17. Fawaz Almtwali and Kamran Emdadi, "Medical Supervision Over Wireless Channels," Fall 2000.

Master's Projects (ECE 798) Supervised

1. Bhargabi Chakrabarti, "Long-Range Acoustic Propagation in the Presence of Internal Waves," Spring 2019

2. Jonathan Mitchell, "Polarization Combining," Fall 2015
3. Robert J. Baummer, "Adaptive Interference Suppression for an Ad Hoc OFDM Network Using the Constant Modulus Array", Spring 2014
4. Miguel Matta, "Source Localization with Time Delay Estimation," Spring 2011
5. Omar Ghowrial, "A Review of Underwater Acoustic Principles and a Study of Newly Developed Underwater Acoustic Networks," Fall 2007.
6. Sandeep Jakkidi, "Processing of Linear FM Signals from the SPICE04 experiment," Fall 2005.
7. Eric St. Pierre, "Sound Speed Estimation from Sparse Environmental Measurements," Spring 2005.
8. Tarun Chandrayadula, "Detection of Low-Order Acoustic Modes Using Matched Subspace Filters," Spring 2003.
9. Jevgenijs Livsics, "Array Processing Techniques for Analyzing Downslope Acoustical Propagation," Fall 2002.

Other Independent Studies Supervised

1. ECE 698: *Computational Ocean Acoustics*, Bhargabi Chakrabarti, Fall 2019.
2. ECE 698: *Random Matrix Methods*, Vaibhav Chavali and Christopher C. Hulbert, Fall 2019.
Enrollment: 2 students.
3. ECE 698: *Inverse Problems*, George R. Gatling, Fall 2018.
4. ECE 498: *Signal Processing Lab*, Phi T. Nguyen, Spring 2016.
5. ECE 899: *Underwater Simulation Technology*, Mehdi Farrokhrooz, Spring 2015.
6. EVPP 693: *Graduate Introduction to Acoustics and Electrical Signals*, Adele L. Roland, Fall 2014. EVPP 693 is a directed studies course in Environmental Science and Public Policy.
7. ECE 698: *Independent Reading and Research*, Mehdi Farrokhrooz, Fall 2014.
8. ECE 498: *Introduction to Array Processing*, Ryan Schell, Fall 2014.

Master's Scholarly Papers Supervised

Prior to the 2016-2017 academic year, all master's students in electrical engineering were required to complete an independent scholarly paper under the supervision of a faculty advisor if they elected not to do a thesis or ECE 798 master's project.

1. Kerolos Nashed, "Implementing Digital Filters on an FPGA," April 2016.
2. George Fava, "An Analysis of Detection Algorithms for Acoustic Tomography," August 2015.
3. Eric Pittelkau, "Concussions and Head Impact Sensors," September 2014.
4. William P. Thall, "Bartlett and Capon AOA Estimation Using a Standard Hexagonal Array," July 2013.
5. John Robinson, "Deriving Low Rank Basis Functions for use in Musical Note Synthesis," May 2013.
6. Farnaz Sedghi, "Multitaper Covariance Estimation", April 2013.
7. Matthew Sowd, "Angle of Arrival Estimation with Electromagnetic Vector Sensors," April 2013.
8. Andrew Jackson, "A Study of Nonparametric Power Spectral Estimators Including a Modified Welch Method with Circular Overlap," December 2012.
9. Matthew Kauppi, "A Study of NASA's Kepler Mission and Transiting Planet Detection," October 2011.
10. Christopher C. Hulbert, "Synthetic Aperture Radar," December 2009.
11. Leslie Rebecca (Mcgonigle) Slaton, "Study and Implementation of Recursive Capon Spectral Estimation Algorithms," July 2009.
12. Songshun Xu, "Single-Snapshot Adaptive Array Processing," June 2008.
13. James C. Rector, "Non-Cooperative Communications Algorithms for Direct Sequence Spread Spectrum Signals," November 2006.
14. Tanit Pongsiri, "Adaptive Beamforming and Weight Generation Using the LMS Algorithm," August 2005.
15. Jude Kalet, "Performance Limitations in Underwater Acoustic Telemetry," May 2005.
16. Matthew Fromm, "A/D Converter Technology," April 2004.
17. Mark Weinberg, "Perception Based Audio Compression Techniques," May 2003.

External Dissertation/Thesis Committee Service

1. Tor Inge Birkenes Lønmo, University of Oslo, “Adaptive Beamforming and Autocalibration for Swath Sonars,” Ph.D., March 2020, Advisor: Andreas Austeng and Roy Edgar Hansen.
2. Ian M. Rooney, University of Massachusetts Dartmouth, Ph.D. in EE, “Variance Reduction Techniques for Power Spectral Density Estimation with Coprime Sensor Arrays,” May 2018, Advisor: John R. Buck.
3. Yang Liu, University of Massachusetts Dartmouth, “Source Enumeration, Localization and Spectral Estimation Using Co-Prime and Other Sparse Sensor Arrays,” Ph.D. in EE, May 2018, Advisor: John R. Buck
4. Kaushallya Adhikari, University of Massachusetts Dartmouth, Ph.D. in EE, “Performance Analysis of Product Processing of Colinear Sparse Arrays,” May 2016, Advisor: John R. Buck.
5. Ian M. Rooney, University of Massachusetts Dartmouth, M.S. in EE, “Implementing Physical Constraints for Noise-Only Mode Shape Estimation,” Dec. 2013, Advisor: John R. Buck.
6. Saurav Tuladhar, University of Massachusetts Dartmouth, M.S. in EE, “Optimum Array Design to Maximize Fisher Information for Bearing Estimation,” May 2011, Advisor: John R. Buck.
7. Lora Van Uffelen, Scripps Institution of Oceanography, Ph.D. in Oceanography, “Acoustic Shadow-Zone Arrivals at Long Range in the North Pacific Ocean,” Aug. 2009, Advisor: Peter F. Worcester.
8. Nabin Sharma, University of Massachusetts Dartmouth, M.S. in EE, “Trading Detection for Resolution in Active Sonar Receivers,” Sept. 2009, Advisor: John R. Buck.

Mason Dissertation and Qualifying Exam Committee Service

1. Haotian Zhai, Research Qualifying Exam Committee. Haotian passed his RQE on May 7, 2020. Advisor: Peter Paris.
2. Ping Xu, Advanced to candidacy, spring 2020, Ph.D. in ECE, Advisor: Zhi Tian.
3. Valerie Winschel, “Autonomous Underwater Vehicle Mission Replanning Decision-Making Using Multiattribute Value Functions,” Ph.D. in IT, May 2019, Advisor: James Jones.
4. Joseph Hecker, “Displacement Estimation in Pulsed Wave Ultrasound Based on Regression of the Phase Spectra,” Ph.D. in ECE, May 2018, Advisor: Siddhartha Sikdar.
5. Elly Roland, “Impacts of Ambient Noise on Minke Whale (*Balaenoptera Acutorostrata*) Habitat Use and Behavior,” Ph.D. in Environmental Science and Policy, December 2017, Advisor: E.C.M. Parsons.
6. Vikas Kotari, “Longitudinal Lesion Tracking in Magnetic Resonance Images,” Ph.D. in ECE, May 2017, Advisor: Vicky Ikonomidou.
7. Khalid AlMuhanna, “Biomarkers of Vulnerable Carotid Artery Plaque Based on Imaging and Simulation,” Ph.D. in ECE, December 2015, Advisor: Siddhartha Sikdar.
8. Marjan Saadati, Research Qualifying Exam Committee Marjan passed her RQE on November 9, 2016. Advisor: Jill Nelson.
9. Hung Lai, “Optimum and Adaptive Processing of Acoustic Vector and Higher Order Sensors,” Ph.D. in ECE, May 2008, Advisor: Kristine Bell.
10. Ken Bentz, “Coherent Processing of the Cross Ambiguity Function Using Perfect Reconstruction Filterbanks,” Ph.D. in ECE, May 2007, Advisor: Anna Baraniecki.
11. Jin Cao, “Principal Component Analysis Based Fault Detection and Isolation,” Ph.D. in ECE, May 2004, Advisor: Janos Gertler.
12. John Uber, “Estimation of the Dimensionality of the Signal Subspace,” Ph.D. in ECE, December 2003, Advisor: Harry Van Trees.
13. Roy Bethel, “Joint Detection and Estimation in a Multiple Signal Array Processing Environment,” Ph.D. in ECE, May 2002, Advisor: Kristine Bell.

Mason Master’s Thesis Committee Service

1. Gowtham Tummala, “Controlled Flight of High DOF Humanoid Robots,” M.S. in EE, August 2021, Advisor: Dan Lofaro.

2. Venkata Sasikiran Veeramachaneni, “Intelligent Selection of Waveform Based on Predicted Target State for Active Sonar”, M.S. in EE, December 2019, Advisor Jill Nelson.
3. Tugba Erpek, “Location Based Propagation Modeling for Opportunistic Spectrum Access in Wireless Networks,” M.S. in EE, January 2008, Advisor: Brian Mark.
4. James C. Wright, “Pattern Recognition Implementation Comparison with Application for Mine Detection in Ground Penetrating Radar,” M.S. in EE, August 2006, Advisor: Kenneth Hintz.
5. Philip Soucacos, “Recovery in Underwater Vehicles Using Robust Reconfigurable Control,” M.S. in EE, August 2006, Advisor: Guy Beale.
6. Brian D. Wemett, “Automatic Target Detection Using Vector Quantization Error,” M.S. in EE, May 2006, Advisor: Yariv Ephraim.

Teaching Activities

Graduate Courses Taught

- *ECE 535: Digital Signal Processing*
Graduate core course in signal processing.
- *ECE 499/590: Microphone Array Processing* (Fall 2016)
A combined undergraduate/graduate elective introducing the fundamentals of linear acoustic array processing.
- *ECE 738: Advanced Digital Signal Processing*
Graduate elective covering advanced topics and providing students with experience in analyzing real data.
- *ECE 754: Optimum Array Processing*
Graduate elective including conventional and adaptive beamformers, sparse arrays, and robust algorithms.

Undergraduate Courses Taught

- *ECE 201: Introduction to Signals and Systems (2017-) or Intro to Signal Analysis (pre-2017)*
First S&S course; required for all electrical and computer engineers. Content revised in 2017.
- *ECE 220 Signals and Systems I (pre-2017)/Continuous-Time Signals and Systems (2017-)*
Continuous-time S&S; required for all electrical and computer engineers. Renumbered ECE 321 in 2020.
- *ECE 320: Signals and Systems II*
Discrete-time S&S course; required for all electrical engineers until curriculum redesign in 2017.
- *ECE 410: Principles of Discrete-Time Signal Processing*
Undergraduate technical elective.
- *ECE 499: Sonar/Radar Signal Processing* (Fall 2020)
Undergraduate technical elective.

Curriculum Development Efforts and Funding

OSCAR Curriculum Development Grant (June 2013- June 2017)

Title: Revising the Signals and Systems Curriculum to Emphasize Student Scholarship

Faculty: Jill Nelson (PI), Pelin Kurtay and Kathleen Wage (co-PIs)

Funding Amount: \$85,000

Students Funded: Fatemeh Pishdadian (three semesters, three summers)

This grant supported a revision of the signals and systems curriculum, focusing primarily on a revision of the laboratory and project assignments to emphasize open-ended problem solving, experiment design, and critical analysis. As a result of this work, ECE 201 and ECE 220/ECE 321 were designated as [Mason Impact](#) courses. This grant also prompted meetings of the faculty teaching the signals courses resulting in a clearer understanding of desired learning outcomes and spurring further revision of a core part of the EE and CpE bachelor’s programs. Specifically, we modified the topical coverage in ECE 201 and 220/321 and eliminated ECE 320.

Teaching Ratings

The following tables summarize the student evaluation data for each course Kathleen Wage has taught at George Mason University. The first table contains data collected with the current version of the course evaluation form. The second table contains data for the version of the course evaluation form used up until Spring 2006.

Ratings: Fall 2006 - present

The ratings in the table below show the mean value of the responses to the following questions:

- Q15: My overall rating of the teaching;
- Q16: My overall rating of this course.

Ratings are on five-point scale, where five corresponds to excellent. The number of responses is indicated for each question. Rating is the mean over the responses. Standard deviation is shown in parentheses.

| Teaching Ratings: Fall 2006 - present | | | | | | |
|---------------------------------------|-----------------|-----------------|----------|-----------|---------------|---------------|
| Term | Course | Level | enrolled | responses | Q15 | Q16 |
| Spring 2021 | ECE 754 | Grad. Elective | 10 | 5, 5 | 4.80 (0.45) | 5.00 (0.00) |
| Fall 2020 | ECE 499 | UGrad. Elective | 14 | 0, 0 | Not Available | Not Available |
| Spring 2020 | ECE 220 | UGrad. Required | 68 | 0, 0 | Not Available | Not Available |
| Fall 2019 | ECE 220-301-Rec | UGrad. Required | 32 | 4, 4 | 4.75 (0.50) | 4.50 (0.58) |
| Fall 2019 | ECE 220-302-Rec | UGrad. Required | 36 | 5, 5 | 4.60 (0.89) | 4.60 (0.89) |
| Spring 2019 | ECE 754 | Grad. Elective | 17 | 17, 17 | 5.00 (0.00) | 5.00 (0.00) |
| Fall 2018 | ECE 201 | UGrad. Required | 100 | 64, 64 | 4.38 (0.92) | 4.06 (1.07) |
| Spring 2017 | ECE 320 | UGrad. Required | 59 | 36, 34 | 4.75 (0.55) | 4.53 (0.99) |
| Fall 2016 | ECE 499/590 | UGrad. Elective | 13 | 11, 12 | 4.91 (0.30) | 4.83 (0.39) |
| Spring 2016 | ECE 201 | UGrad. Required | 91 | 38, 38 | 4.84 (0.44) | 4.63 (0.67) |
| Fall 2015 | ECE 201 | UGrad. Required | 115 | 82, 81 | 4.54 (0.79) | 4.37 (0.86) |
| Spring 2015 | ECE 738 | Grad. Elective | 8 | 6, 6 | 5.00 (0.00) | 5.00 (0.00) |
| Fall 2014 | ECE 201 | UGrad. Required | 48 | 38, 36 | 4.79 (0.47) | 4.50 (0.56) |
| Spring 2014 | ECE 220 | UGrad. Required | 79 | 57, 57 | 4.86 (0.40) | 4.56 (0.66) |
| Fall 2013 | ECE 754 | Grad. Elective | 7 | 7, 7 | 5.00 (0.00) | 5.00 (0.00) |
| Spring 2013 | ECE 410 | UGrad. Elective | 14 | 12, 12 | 4.75 (0.45) | 4.67 (0.65) |
| Fall 2012 | ECE 320 | UGrad. Required | 21 | 14, 14 | 4.86 (0.36) | 4.36 (0.74) |
| Spring 2012 | ECE 738 | Grad. Elective | 18 | 16, 16 | 4.94 (0.25) | 4.81 (0.40) |
| Fall 2011 | ECE 320 | UGrad. Required | 45 | 37, 37 | 4.86 (0.35) | 4.68 (0.47) |
| Fall 2010 | ECE 754 | Grad. Elective | 16 | 15, 15 | 4.93 (0.26) | 4.80 (0.41) |
| Spring 2009 | ECE 754 | Grad. Elective | 10 | 8, 8 | 4.88 (0.35) | 4.88 (0.35) |
| Fall 2008 | ECE 320 | UGrad. Required | 38 | 28, 28 | 4.32 (1.09) | 4.18 (1.22) |
| Spring 2008 | ECE 220 | UGrad. Required | 55 | 43, 43 | 4.42 (0.76) | 4.00 (1.00) |
| Fall 2007 | ECE 738 | Grad. Elective | 16 | 14, 15 | 4.36 (0.84) | 4.33 (0.90) |
| Spring 2007 | ECE 220 | UGrad. Required | 47 | 38, 38 | 4.95 (0.23) | 4.63 (0.59) |
| Fall 2006 | ECE 220 | UGrad. Required | 49 | 32, 32 | 4.97 (0.18) | 4.63 (0.55) |

Notes on 2020: The university did not collect teaching evaluations in Spring 2020 due to the pandemic. In Fall 2020, the university implemented a new online system for teaching evaluations. Unfortunately, the response rate for ECE 499 was too low for a report to be generated.

Ratings: Fall 1999 - Spring 2006

The ratings in the table below show the mean value of the responses to the following questions:

- Q1: My instructor's preparation for class;
- Q6: The overall rating of teaching.

Ratings are on five-point scale, where five corresponds to excellent. The number of responses is indicated for each question. Rating is the mean over the responses. Standard deviation is shown in parentheses.

| Teaching Ratings: Fall 1999 - Spring 2006 | | | | | | |
|---|---------|-----------------|----------|-----------|-------------|-------------|
| Term | Course | Level | enrolled | responses | Q1 | Q6 |
| Spring 2006 | ECE 738 | Grad. Elective | 16 | 14, 14 | 4.64 (0.63) | 4.50 (0.76) |
| Fall 2005 | ECE 410 | UGrad. Elective | 19 | 18, 18 | 4.78 (0.55) | 4.56 (0.62) |
| Fall 2004 | ECE 410 | UGrad. Elective | 28 | 23, 23 | 4.78 (0.42) | 4.78 (0.42) |
| Spring 2004 | ECE 535 | Grad. Elective | 30 | 14, 14 | 5.00 (0.00) | 4.86 (0.36) |
| Fall 2003 | ECE 410 | UGrad. Elective | 19 | 17, 17 | 5.00 (0.00) | 5.00 (0.00) |
| Spring 2003 | ECE 535 | Grad. Elective | 21 | 20, 20 | 5.00 (0.00) | 4.95 (0.22) |
| Fall 2002 | ECE 320 | UGrad. Required | 25 | 22, 22 | 4.86 (0.35) | 4.82 (0.39) |
| Spring 2002 | ECE 320 | UGrad. Required | 36 | 31, 31 | 4.71 (0.64) | 4.39 (0.80) |
| Fall 2001 | ECE 410 | UGrad. Elective | 23 | 21, 21 | 4.90 (0.44) | 4.67 (0.58) |
| Spring 2001 | ECE 535 | Grad. Elective | 15 | 13, 13 | 5.00 (0.00) | 4.92 (0.28) |
| Fall 2000 | ECE 320 | UGrad. Required | 24 | 20, 20 | 5.00 (0.00) | 4.85 (0.37) |
| Spring 2000 | ECE 535 | Grad. Elective | 11 | 9, 9 | 4.89 (0.33) | 4.89 (0.33) |
| Fall 1999 | ECE 535 | Grad. Elective | 8 | 8, 8 | 4.88 (0.35) | 4.75 (0.46) |

Outreach and Leadership in Education

Tutorial Videos

Kathleen Wage posts tutorial videos about signals and systems and signal processing topics on her YouTube channel: <http://www.youtube.com/ProfKathleenWage>. While the videos are made for Mason courses, they have been used by people in at least 60 countries according to YouTube Analytics. As of August 20, 2021, the 40 videos have been viewed 695,435 times for a total of 45,101 hours.¹

Able Sea Chicks Blog

<http://ableseachicks.blogspot.com>

Kathleen Wage and Lora Van Uffelen developed a blog and videos to introduce young women and girls to ocean acoustics and engineering. As a part of this work they did a live broadcast from the R/V Revelle in the Philippine Sea back to the Girl Scout session at the Acoustical Society of America Meeting in April 2010. The official magazine of the Oceanography Society included the Able Sea Chicks in a special series of [autobiographical sketches](#) published in 2014: *Oceanography*, vol. 27(4), p. 245.

Invited Article and Hot Topics Lecture on Education

Recognizing her leadership in promoting active learning, the Acoustical Society (ASA) invited Kathleen Wage to write an [article](#) for the society magazine *Acoustics Today*. ASA's Education Technical Committee invited her to give a showcase lecture during the biennial meeting in November 2018. ASA Technical Committees invite one speaker to represent their committee in the interdisciplinary Hot Topics in Acoustics session every fourth meeting. The presentation titled "[DJ Prof: Mixing instructional modes to improve student learning](#)" included a short pre-lecture quiz and interactive exercises designed to demonstrate active learning techniques.

¹An earlier version of the CV (dated 15 July 2021) had a typo: "minutes" should have been "hours".

Professional Leadership and Recognition

- Associate Editor, *IEEE Journal of Oceanic Engineering*, 2005-2021
- Chair, IEEE Underwater Acoustic Signal Processing Workshop, 2013, 2015, and 2017
- Treasurer, IEEE Underwater Acoustic Signal Processing Workshop, 2019
- Selected by the IEEE Journal of Oceanic Engineering Editorial Board to be one of the Journal's Outstanding Reviewers of 2019. DOI: [10.1109/JOE.2020.2975524](https://doi.org/10.1109/JOE.2020.2975524)

Professional Service

Conference and Local IEEE Chapter Committees

- Publications Chair, IEEE GlobalSIP 2016
- Officer, IEEE Signal Processing Society Northern VA Chapter, Secretary (2001-2004), Co-Chair (2004-2005)
- Conference coordinator, IEEE Sensor Array and Multichannel Signal Processing Workshop, 2002

Advisory Board

- Member of Advisory Board for NSF WIDER Grant, 2013-2016, PI: Jill K. Nelson

Technical Committee Member

- Signal Processing Technical Committee Member, Acoustical Society of America, 2018-2023
- Underwater Acoustics Technical Committee Member, Acoustical Society of America, 2015-2021, 2004-2007.
 - Delegate to the Technical Program Organizing Committee for the spring 2006 meeting.
 - Coordinator of Underwater Acoustics Student Paper Contest, Acoustical Society of America, 2005-2006.
- IEEE Statistical Signal Processing Workshop, 2012
- IEEE Underwater Acoustic Signal Processing Workshop, 2011, 2021
- Acoustical Oceanography Technical Committee Member, Acoustical Society of America, 2004-2010

Technical Paper Reviewer

- IEEE Journal of Oceanic Engineering, 2003, 2006, 2007, 2009, 2012, 2016, 2018, 2020
- IEEE Journal of Selected Topics in Signal Processing, 2018-2019
- IEEE Signal Processing Letters, 2001, 2014, 2015, 2018, 2019
- IEEE Signal Processing Magazine, 2004-2005
- IEEE Sensors Journal, 2017
- IEEE Transactions on Aerospace and Electronics, 2015, 2019
- IEEE Transactions on Biomedical Engineering, 2018
- IEEE Transactions on Cybernetics, 2017
- IEEE Transactions on Education, 2004, 2007, 2011, 2014, 2016-2018
- IEEE Transactions on Signal Processing, 2004-2005, 2015
- Journal of the Acoustical Society of America, 2006-2007, 2009-2013, 2015-2021
- Journal of the Acoustical Society of America Express Letters, 2017, 2019
- Journal of Engineering Education, 2010
- Journal of Atmospheric and Oceanic Technology, 2003
- Sensors Open Access Journal, 2017
- International Federation of Automatic Control Annual Reviews in Control, 2004-2006
- ASEE Annual Conference, 2006
- IEEE Digital Signal Processing/Signal Processing Education Workshop, 2008
- IEEE Global Communications Conference (GLOBECOM), 2003
- IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP), 2001, 2004, 2005
- IEEE OCEANS Conference 2019 (Seattle), 2020 (Singapore and Gulf Coast), 2021 (San Diego)

Conference Session Chair

- Random Matrix Theory in Acoustics special session at the 179th Meeting of the Acoustical Society of America, 2020 (virtual)
- Beamforming session in Track E (Array Processing and Multisensor Systems) at IEEE Asilomar Conference on Signals, Systems, and Computers, 2020 (virtual)
- Signal Processing in Acoustics: Beamforming, Detection and Localization session at the 177th Meeting of the Acoustical Society of America, 2019
- Underwater Soundscapes and Noise: Measurement and Abatement session at the 174th Meeting of the Acoustical Society of America, 2017
- Passive Acoustic Inversion special session at the 170th Meeting of the Acoustical Society of America, 2015
- Random Matrix Theory special session at the 164th Meeting of the Acoustical Society of America, 2012
- Courses and Assessment session at the 5th IEEE Signal Processing Education Workshop, January 2009
- Acoustical Oceanography session at the Acoustical Society of America Spring Meeting, June 2007
- Underwater Acoustics session at Acoustical Society of America Spring Meeting, June 2006
- Underwater Acoustics session at Acoustical Society of America Spring Meeting, May 2005
- Source Localization and Tracking session at ICASSP, March 2005
- Pre-College Projects session at IEEE Frontiers in Education Conference, November 2003
- Acoustical Oceanography session at Acoustical Society of America Spring Meeting, April 2003

Grant and Fellowship Reviewer

- NSF Ocean Technology and Interdisciplinary Coordination Program Reviewer, 2017
- NSF Innovation in Engineering Education, Curriculum, and Infrastructure Panel Review, 2009
- NSF Course, Curriculum, and Laboratory Improvement Program Panel Review, 2004
- MIT Sea Grant College Program, 2001
- AFCEA Educational Foundation fellowship applications, 2000-2006

Academic Leadership and Mentoring

- Chair of ECE Department PhD Committee, 2008-2016
- Author of successful university grants worth \$547,500 to fund ECE Provost Scholarships
 - \$267,000 in 2011-2014 and \$280,500 in 2015-2017
 - Scholarships supported 21 students advised by 15 different ECE faculty members
- Chair of the Signal Processing Technical Interest Group, March 2019-present
- Distinguished Mentoring Fellow for a Faculty Mentoring Community (Provost's Office initiative to support the professional well-being of incoming tenure-track faculty), AY 2020-2021
- Mentor to new faculty member in program sponsored by GMU's Center for Teaching Excellence, 2004-2006

Academic Service

University Service

- Member of the Presidential Awards Committee, 2019-2020
- Colloquium presenter for the Honors 110 Research Methods course: 11/7/2008, 11/12/2010.

Volgenau School of Engineering Service

- VSE Early-Career Faculty Research Strategy Seminar Series Participant (session on DOD funding) October 4, 2019 and October 16, 2020
- Member of the Review Committee for Dean Ken Ball's reappointment, 2017
- Member of the Search Committee for the Dean of the Volgenau School of Engineering, 2011
- ECE representative to task force to develop School of IT&E policy on conflicts of interest, Fall 2004

ECE Department Committees

- Member of ECE Graduate Committee, Fall 2019-present
- Member of the Search Committee for a Research Assistant Professor position, Spring 2021
- Member of the ECE Department Strategic Advisory Committee, 2014-2016
- Member of the ECE Department Web Design Committee, 2015-2017
- Member of the Search Committee for the Chair of the ECE Department, 2014
- Chair of the Promotion & Tenure Committee for Jim Jones, Fall 2018
- Co-Chair of the Promotion Committee for Craig Lorie, Fall 2016
- Member of the Promotion & Tenure Committee for Jill Nelson, Fall 2011
- Member of ECE Department PhD Committee, 2001-2008
- Member of ECE Department Faculty Search Committee, 2005 and 2006
- Member of ECE Department Chair Review Committee, Fall 2005

Other Department Service

- Teaching observations for promotion and contract renewal cases
 - September 14, 2020: Craig Lorie (ECE 445)
 - October 9, 2019: Dan Lofaro (ECE 421)
 - September 26, 2019: Pelin Kurtay (ECE 101)
 - September 13, 2016: Craig Lorie (ECE 331)
 - October 29, 2015: Vicky Ikonomidou (BENG 220)
 - February 24, 2011: Jill Nelson (ECE 460)
- Coordinator of ECE Department Alumni Survey prior to ABET Visit, 2012
- Coordinator of ECE Department survey of undergraduate students prior to ABET visit, Fall 2000

Professional and Honor Society Memberships

- Senior Member, Institute of Electrical and Electronics Engineers
- Member, Acoustical Society of America
- Member, American Geophysical Union
- Member, American Society for Engineering Education
- Member, Eta Kappa Nu Electrical Engineering Honor Society
- Member Sigma Xi Scientific Research Society
- Member, Tau Beta Pi Engineering Honor Society