Eileen R. Martin

she/her

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Academic Appointments

Research Assistant Professor, Colorado School of Mines, Golden, CO
- Department of Geophysics — Jun. 2021 - present
- Incoming Assistant Professor in Geophysics and AMS — beginning Jan. 2022

Assistant Professor, Virginia Tech, Blacksburg, VA — Aug. 2018 - present
- Department of Mathematics (primary appointment)
- Program in Computational Modeling and Data Analytics
- Department of Geosciences (affiliate faculty since Dec. 2019)

Affiliate, Lawrence Berkeley National Laboratory, Berkeley, CA — 2016-2020
- Earth and Environmental Sciences Area, Geophysics Department

Education

Ph.D. Computational and Mathematical Engineering, **Stanford University**
Dissertation: June 2018
Passive Imaging and Characterization of the Subsurface with Distributed Acoustic Sensing
Readers: Biondo Biondi (advisor), Jonathan Ajo-Franklin, George Papanicolaou

M.S. Geophysics **Stanford University**
Masters research presentation: June 2017
Stanford DAS Array: Ambient Noise and Earthquake Recordings
Committee: Biondo Biondi (advisor) and Greg Beroza

B.S. Dean's Scholars Honors Mathematics, **University of Texas at Austin**
Dean's Honored Graduate, graduated with high honors May 2012
Honors thesis: *Global Coordinate Systems: Continuously Moving Finite-Dimensional Unit Norm Tight Frames on Smooth Manifolds*
Advisor: Daniel Freeman (advisor)

B.S. Computational Physics **University of Texas at Austin**
Graduated with high honors May 2012

Honors, Awards, Fellowships

Luther and Alice Hamlett Junior Faculty Fellow 2019-present
Fellowship in Virginia Tech's Academy of Integrated Science

Gene Golub Dissertation Award 2018
Top dissertation, Institute for Computational and Mathematical Engineering, Stanford

Best student poster paper at SEG Annual Meeting, co-author 2017
Awarded for Huot et al., *Automatic Noise Exploration in Urban Areas*

Schlumberger Innovation Fellowship 2016-2017

DOE Computational Science Graduate Fellowship 2012-2016

Stanford ICME Student Leadership Award 2014

NSF Graduate Research Fellowship Program award offered 2012

Dean's Honored Graduate, UT-Austin College of Natural Sciences 2012

Barry M. Goldwater Scholarship 2011-2012

External Funding

NSF 2046387, Office of Advanced Cyberinfrastructure

Amount: $398,024 awarded to date ($509,722 total intended)
CAREER: Scalable Computational Seismology for All
PI: E.R. Martin
Period of Performance: 7/1/21 - 6/30/26

Subcontract 3437-AFR-2S+, Luna Innovations, Inc.
Amount to Virginia Tech: $100,000
Swift and QUiet Airfield Assessment Device (SQUAAD), Phase II
PI: R. Green (Virginia Tech, Civil & Environmental Engineering), Co-PI: E.R. Martin
Period of Performance: 3/1/21-2/1/22

NSF 2034366, Signals in the Soil Program
Amount to Virginia Tech: $216,167
SitS: Collaborative Research: Understand and Forecast Long-term Variations of In-situ Geophysical and Geomechanical Characteristics of Degrading Permafrost in the Arctic
PI: M. Xiao (Penn State, Civil & Environmental Engineering), Co-PIs: E.R. Martin, D. Nicolsky (University of Alaska Fairbanks, Geophysical Institute), T. Zhu (Penn State, Geosciences), A. Jensen (University of Alaska Fairbanks, Anthropology)
Period of performance: 1/1/21-12/31/23

DOE DE-FE0091786, Office of Fossil Energy
Amount: $1,874,999 total = $1,499,999 DOE + $375,000 non-DOE
Fully Distributed Acoustic and Magnetic Field Monitoring via a Single Fiber Line for Optimized Production of Unconventional Resource Plays
Lead PI: G. Pickrell (Virginia Tech, Materials Science and Engineering), PIs: L. Ma (Sentek Instrument LLC), E.R. Martin
Period of performance: 10/1/19-6/30/22

MAA Tensor Women and Mathematics Grant
Amount: $6,000
SURE: Speakers and Undergraduate Research Engagement
PI: G. Matthews (Virginia Tech, Math), Co-PI: E.R. Martin
Period of performance: 6/1/21-5/31/22

Subcontract 4000175567, UT-Batelle, LLC for Oak Ridge National Laboratory
Amount: $94,985
Fast Comparative Algorithms for Sensor Array Summaries
PI: E.R. Martin
Period of Performance: 11/11/19-8/15/21

NSF 1937984, Engineering for Civil Infrastructure program
Amount: $157,973
EAGER: Exploration of an Interdisciplinary Approach to Resolving a Critical Issue in Evaluating Liquefaction Hazard of Challenging Soil Sites
PI: E.R. Martin, Co-PIs: A. Yerro Colom and R. Green (both Virginia Tech Civil & Environmental Engineering)
Period of Performance: 8/1/19-7/31/22

MAA Tensor Women and Mathematics Grant
Amount: $6,000
SURE: Speakers and Undergraduate Research Engagement
PI: G. Matthews (Virginia Tech Math), Co-PIs: E.R. Martin and L. Zietsman (Virginia Tech Math)
Period of performance: 6/1/19-5/31/20

DE-SC0019630, DOE Phase I STTR with Luna Innovations
Amount to Virginia Tech: $51,433
Advanced Computational Methods Towards High-Resolution Fiber Optic Distributed Acoustic Sensing
PI: D. Rountree (Luna Innovations), Co-PI: E.R. Martin
Period of performance: 2/19/19-11/18/19

Internal Funding

Luther and Alice Hamlett Undergraduate Research Support, AIS
Total amount: $6,000
Spring 2019: Data compression for next-generation seismic sensor networks
Spring 2020: Footstep removal to protect resident privacy in urban seismology data
Summer 2021: Compression and Data Product Streams in Permafrost Thaw Monitoring
PI: E.R. Martin
Period of performance: 1/14/19-6/30/25

Luther and Alice Hamlett Junior Faculty Fellowship, AIS
Amount varies annually depending on investment fund returns.
Period of performance: 8/19 - 7/22

Seed Grant from Penn State Institute of Energy and the Environment
Amount: $50,000 (at Penn State)
Lighting Up the Subsurface for Tomorrow's City: Initiating a Penn State DAS Array for Mapping Near-Surface Geology
PI: T. Zhu (Penn State Geosciences), Co-PIs: E.R. Martin, A. Nyblade (Penn State Geosciences), P. Fox (Penn State Civil & Env. Engineering)
Period of performance: 3/1/19-12/31/19

Articles Under Review

1. W. Trainor-Guitton, **E.R. Martin**, V. Rodríguez Tribaldos, N. Taverna, V. Dumont, 2021, *Distributed Sensing and Machine Learning Hone Seismic Listening*, under review.
2. K.M. Yost, J. Cooper, R.A. Green, **E.R. Martin**, 2021, *Correcting measured CPT tip resistance for multiple thin layer effects*, under review.

Journal Articles

1. K. Yost, A. Yerro, R.A. Green, **E.R. Martin**, J. Cooper, 2021, *MPM Modeling of Cone Penetrometer Testing for Multiple Thin-Layer Effects in Complex Soil Stratigraphy*, accepted to Journal of Geotechnical and Geoenvironmental Engineering.
2. J. Cooper, **E.R. Martin**, K.M. Yost, A. Yerro, R.A. Green, 2021, *Robust identification and characterization of thin soil layers in cone penetration data by piecewise layer optimization*, Computers and Geotechnics, 141, article no. 104404.
   Code at https://github.com/jonc7/Soil-Layer-Optimization
   Preprint at https://vtechworks.lib.vt.edu/handle/10919/104628
3. J. Kump, **E.R. Martin**, 2021, *Multichannel Analysis of Surface Waves Accelerated (MASWAccelerated): Software for Efficient Surface Wave Inversion Using MPI and GPUs*, Computers & Geosciences, 156, article no. 104903.
   Code at https://github.com/jlk9/MASWA
   Preprint at https://arxiv.org/abs/2003.02256
4. K.M. Yost, R.A. Green, S. Upadhyaya, B.W. Maurer, A. Yerro-Colom, **E.R. Martin**, J. Cooper, 2021, *Assessment of the Efficacies of Correction Procedures for Multiple Thin Layer Effects on Cone Penetration Tests,* Soil Dynamics and Earthquake Engineering, 144, 106677.

5. N.J. Lindsey, **E.R. Martin**, 2021, *Fiber-optic Seismology*, Annual Review of Earth and Planetary Sciences, 49, pp. 309-336.
Preprint at https://vtechworks.lib.vt.edu/handle/10919/99469
6. T. Zhu, J. Shen, **E.R. Martin**, 2021, *Sensing Earth and Environment Dynamics by Telecommunication Fiber-optic Sensors: An Urban Experiment in Pennsylvania USA*, Solid Earth, 12(1), pp. 219-235.
7. **E.R. Martin**, 2021, *A Linear Algorithm for Ambient Seismic Noise Double Beamforming Without Explicit Crosscorrelations,* Geophysics, 86(1), pp. IJF-V89.
Code at https://github.com/eileenrmartin/doubleBeamforming.
8. G. Fang, Y.E. Li, Y. Zhao, **E.R. Martin**, 2020, *Urban Near-surface Seismic Monitoring using Distributed Acoustic Sensing*, Geophysical Research Letters, 47(6), e2019GL086115.
9. Z.J. Spica, M. Perton, **E.R. Martin**, G.C. Beroza, B.L. Biondi, 2020, *Urban Seismic Site Characterization by Fiber-Optic Seismology*, Journal of Geophysical Research: Solid Earth, 125(3), e2019JB018656.
10. **E.R. Martin**, F. Huot, Y. Ma, R. Cieplicki, S. Cole, M. Karrenbach, B.L. Biondi, 2018, *A Seismic Shift in Scalable Acquisition Demands New Processing: Fiber-Optic Seismic Signal Retrieval in Urban Areas with Unsupervized Learning for Coherent Noise Removal*, IEEE Signal Processing Magaine, **35**(2), pp. 31-40.
11. N.J. Lindsey, **E.R. Martin**, S. Cole, D. Dreger, S. James, B. Freifeld, B. Biondi, J. Ajo-Franklin, 2017, *Fiber-Optic Network Observations of Earthquake Wavefields*, Geophysical Research Letters, **44**(23), pp. 11792-11799.
12. S. Dou, N. Lindsey, A. Wagner, T. Daley, B. Freifeld, M. Robertson, J. Peterson, C. Ulrich, **E.R. Martin**, J. Ajo-Franklin, 2017, *Distributed Acoustic Sensing for Seismic Monitoring of the Near Surface: A Traffic-Noise Interferometry Example*, Scientific Reports, 7, article 11620.
13. Y. Li, H. Yang, **E.R. Martin**, K.L. Ho, L. Ying, 2015, *Butterfly Factorization*, Multiscale Model. Simul., 13, pp. 714-732.
14. D. Freeman, R. Hotovy, **E.R. Martin** , 2014, *Moving Finite Unit Norm Tight Frames for S^n*, Illinois J. of Math, 58, pp. 311-322.

Professional Periodicals

1. A. Titov, A. Girard, **E.R. Martin**, 2021, *Research Committee Update: Working with – and for – early-career researchers*, The Leading Edge, 40(6), pp. 464-464.
2. S. Jakkampudi, J. Shen, W. Li, A. Dev, T. Zhu, **E.R. Martin**, 2020, *Footstep Detection in Urban Seismic Data with a Convolutional Neural Network*, The Leading Edge, 39(9), pp. 654-660.
3. **E.R. Martin**, 2020, *Research Committee Update: Shining a Light on Cities with Seismic Data*, The Leading Edge, 39(6), pp. 437-437.
4. **E.R. Martin**, C. Castillo, S. Cole, S. Sawasdee, S. Yuan, R. Clapp, M. Karrenbach, B. Biondi, 2017, *Seismic Monitoring Leveraging Existing Telecomm Infrastructure at the Stanford Distributed Acoustic Sensing Array: Active, Passive and Ambient Noise Analysis*, The Leading Edge, 36(12), pp. 1025-1031.

Book Chapters

1. **E.R. Martin**, N.J. Lindsey, B. Biondi, J.B. Ajo-Franklin. "Introduction to Interferometry of Fiber Optic Strain Measurements." *Distributed Acoustic Sensing in Geophysics: Methods and Applications*, edited by Y. Li, M. Karrenbach, J.B. Ajo-Franklin, American Geophysical Union Geophysical Monograph Series, 2021, pages to be set at release in Nov. 2021. Preprint available at https://eartharxiv.org/sx9zt/.

2. B. Biondi, S. Yuan, **E.R. Martin**, F. Huot, R.G. Clapp. "Using telecommunication fiber infrastructure for earthquake monitoring and near-surface characterization." *Distributed Acoustic Sensing in Geophysics: Methods and Applications*, edited by Y. Li, M. Karrenbach, J.B. Ajo-Franklin, American Geophysical Union Geophysical Monograph Series, 2021, pages to be set at release in Nov. 2021.

Conference Papers

1. **E.R. Martin**, J. Kump, S. Morgan, T. Zhu, *Analyzing Massive, Passive DAS Data in Wavelet-compressed Form*, 2021, SEG — AGU Advances in Distributed Sensing for Geophysics Workshop, online, 8-9 Feb.
2. F. Huot, **E.R. Martin**, Z. Spica, B. Biondi, *Distributed Acoustic Sensing (DAS) for large-scale urban monitoring and geologic hazard mitigation using preexisting telecommunication infrastructure*, 2019, SEG/EAGE Workshop on Geophysical Aspects of Smart Cities, Singapore, 10-12 Dec.
3. T. Zhu, **E.R. Martin**, J. Shen, *New Signals in Massive Data Acquired by Fiber Optic Seismic Monitoring Under Pennsylvania State University*, 2019, SEG/EAGE Workshop on Geophysical Aspects of Smart Cities, Singapore, 10-12 Dec., preprint.
4. **E.R. Martin**, *Scalable Seismic Acquisition and Algorithms for Next-Generation Engineering Geophysics*, (invited) 2019, International Conference on Engineering Geophysics, Al Ain, United Arab Emirates, 9-12 Oct.
5. **E.R. Martin**, *A Scalable Algorithm for Cross-correlations of Compressed Ambient Seismic Noise*, 2019, 89th Ann. Internat. Mtg. SEG Expanded Abstracts. doi: 10.1190/segam2019-3216637.1
6. **E.R. Martin**, B. Biondi, *Eighteen months of near-surface monitoring with ambient noise at the Stanford Fiber Optic Seismic Observatory*, 2018, 88th Ann. Internat. Mtg. SEG Expanded Abstracts. doi: 10.1190/segam2018-2997853.1
7. F. Huot, **E.R. Martin**, B. Biondi, *Automated ambient-noise processing applied to fiber-optic seismic acquisitions (DAS)*, 2018, 88th Ann. Internat. Mtg. SEG Expanded Abstracts. doi: 10.1190/segam2018-2997880.1
8. **E.R. Martin** and B.L. Biondi, *Ambient noise interferometry across two-dimensional DAS arrays*, 2017, 87th Ann. Internat. Mtg. SEG Expanded Abstracts. doi: 10.1190/segam2017-17677759.1
9. B. Biondi, **E.R. Martin**, S. Cole, M. Karrenbach, N. Lindsey, *Earthquakes analysis using data recorded by the Stanford DAS array*, 2017, 87th Ann. Internat. Mtg. SEG Expanded Abstracts. doi: 10.1190/segam2017-17745041.1
10. F. Huot, Y. Ma, R. Cieplicki, **E.R. Martin**, B. Biondi, *Automatic noise exploration in urban areas*, 2017, 87th Ann. Internat. Mtg. SEG Expanded Abstracts (awarded best student poster paper). doi: 10.1190/segam2017-17774369.1
11. J.B. Ajo-Franklin, S. Dou, N. Lindsey, T. Daley, B. Freifeld, **E.R. Martin**, C. Ulrich, T. Wood, I. Eckblaw, A. Wagner, M. Robertson, *Timelapse surface wave monitoring of permafrost thaw using distributed acoustic sensing and a permanent automated seismic source*, 2017, 87th Ann. Internat. Mtg. SEG Expanded Abstracts. doi: 10.1190/segam2017-17774027.1
12. **E.R. Martin**, B. Biondi, M. Karrenbach, S. Cole, *Ambient noise interferometry from DAS array in underground telecommunications conduits*, 2017, EAGE Annual Meeting Proceedings. doi: 10.1190/segam2017-17774027.1
13. **E.R. Martin**, B.L. Biondi, M. Karrenbach, S. Cole, *Continuous Subsurface Monitoring by Passive Seismic with Distributed Acoustic Sensors- The "Stanford Array" Experiment*, 2017, Extended Abstracts of the 1st EAGE Workshop on Practical Reservoir Monitoring. doi: 10.3997/2214-4609.201700017

14. **E.R. Martin**, P. Wills, D. Hohl, J.L. Lopez, *Using machine learning to predict production at a Peace River thermal EOR site*, Proceedings of the 2017 SPE Reservoir Simulation Conference. SPE-192696-MS. doi: 10.2118/182696-MS
15. **E.R. Martin**, N.J. Lindsey, S. Dou, J.B. Ajo-Franklin, A. Wagner, K. Bjella, T.M. Daley, B. Freifeld, M. Robertson, C. Ulrich, *Interferometry of a roadside DAS array in Fairbanks, AK*, 2016, 86th Ann. Internat. Mtg. SEG Expanded Abstracts. doi: 10.1190/segam2016-13963708.1
16. **E.R. Martin**, J. Ajo-Franklin, N. Lindsey, T.M. Daley, B. Freifeld, M. Robertson, C. Ulrich, S. Dou, A. Wagner, *Interferometry of ambient noise from a trenched distributed acoustic sensing array*, 2015, 85th Ann. Internat. Mtg. SEG Expanded Abstracts. doi: 10.1190/segam2015-5902207.1
17. J. Ajo-Franklin, N. Lindsey, T.M. Daley, B. Freifeld, **E.R. Martin**, M. Robertson, C. Ulrich, A. Wagner, *A field test of distributed acoustic sensing for ambient noise recording*, Expanded Abstracts of the 2015 SEG Ann. Internat. Mtg. doi: 10.1190/segam2015-5926936.1

Technical Reports

1. **E.R. Martin**, *Eighteen months of continuous near-surface monitoring with DAS data collected under Stanford University*, SEP 172, 2018.
2. F. Huot, **E.R. Martin**, B. Biondi, *Automated ambient noise processing applied to fiber optic seismic acquisition*, SEP 172, 2018.
3. **E.R. Martin**, B. Biondi, G. Fabient-Ouellet, R.G. Clapp, *Sensitivity analysis of distributed acoustic sensing arrays*, SEP 170, 2017.
4. **E.R. Martin**, B. Biondi, *Time-lapse changes in ambient noise interferometry and dispersion analysis at the Stanford DAS Array*, SEP 170, 2017.
5. R. Clapp, S. Farris, T. Dahlke, **E.R. Martin**, *C++11 non-linear solver*, SEP 170, 2017.
6. **E.R. Martin**, B. Biondi, S. Cole, M. Karrenbach, *Overview of the Stanford DAS Array-1 (SDASA-1)*, SEP 168, 2017.
7. B. Biondi, **E.R. Martin**, S. Cole, M. Karrenbach, *Earthquakes analysis using data recorded by the Stanford DAS Array*, SEP 168, 2017.
8. **E.R. Martin**, B. Biondi, *Ambient noise interferometry on two-dimensional DAS arrays*, SEP 168, 2017.
9. F. Huot, Y. Ma, R. Cieplicki,**E.R. Martin**, B. Biondi, *Automatic noise exploration in urban areas*, SEP 168, 2017.
10. E. Williams, **E.R. Martin**, *Detection and removal of coherent anthropogenic noise from passive seismic data*, SEP 165, 2016.
11. **E.R. Martin**, N. Lindsey, S. Dou, J. Ajo-Franklin, A. Wagner, K. Bjella, T. Daley, B. Freifeld, M. Robertson, C. Ulrich, *Interferometry of a roadside DAS array in Fairbanks, AK*, SEP 163, 2016.
12. **E.R. Martin**, J. Ajo-Franklin, N. Lindsey, T. Daley, B. Freifeld, M. Robertson, C. Ulrich, S. Dou, A. Wagner, *Applying interferometry to ambient seismic noise recorded by a trenched distributed acoustic sensing array*, SEP 158, 2015.
13. **E.R. Martin**, *Compression for effective memory bandwidth use in forward modeling*, SEP 152, 2014.
14. **E.R. Martin**, R. Clapp, H. Le, C. Leader, D. Nichols, *SEPVector: a C++ inversion library*, SEP 152, 2014.
15. M. Denolle, S. de Ridder, J. Chang, **E.R. Martin**, T. Dahlke, H. Arevalo-Lopez, Sr., S. Levin, *Scholte-wave excitation*, SEP 150, 2013.

Invited Talks

(Upcoming) Conference on Data Analysis (invited) Santa Fe, NM, Apr. 2022
(Upcoming) Numerical Analysis and Scientific Computing Seminar NYU Courant, remote, Nov. 2021
(Upcoming) DAS Workshop - Infrastructure & Imaging - NHERI@UTexas Baton Rouge, LA and virtual, Oct. 2021
Southern California Earthquake Center Annual Meeting (plenary) remote, Sep. 2021
GAGE/SAGE Community Science Workshop (plenary) remote, Aug. 2021
Caltech Seismological Lab Seminar Caltech, remote, Apr. 2021
IRIS Board of Directors Meeting remote, Feb. 2021
Heiland Lecture Colorado School of Mines, remote, Feb. 2021
AGU Fall Meeting session on Observation of Rotation, Strain and Translation in Seismology - Applications, Instrumentation and Theory (invited), remote, Dec. 2020
Scientific Computing and Numerics Seminar Cornell University, remote, Nov. 2020
Applied Geophysics Research Seminar ExxonMobil, remote, Aug. 2020
Mathematics and Computer Science Division Seminar Argonne National Lab, remote, Jul. 2020
Earthquake Science Center Seminar US Geological Survey, remote, Jul. 2020
Institute of Geophysics Seminar University of Hamburg, remote, Jun. 2020
EGU General Assembly session on Ambient noise seismology: Topics, targets, tools & techniques (invited) remote, May 2020
Women in Data Science at Stanford Earth (invited) Stanford University, Nov. 2019
International Conference on Engineering Geophysics (invited) Al Ain, UAE, Oct. 2019
BiSEPPS Seminar Harvard University, Cambridge, MA, May 2019
Solid Earth Brownbag Seminar Princeton University, Princeton, NJ, May 2019
IRIS Workshop: Foundations, Frontiers and Future Facilities for Seismology (plenary) Albuquerque, NM, Jun. 2018
Heiland Lecture Colorado School of Mines, Golden, CO, Jan. 2018
Seismology Seminar Lawrence Livermore National Lab, Livermore, CA, 2017

Tutorial Talks

Surface DAS and Environmental Applications, SEG/AAPG IMAGE Special Session, An Introduction to DAS: Using Fiber Optics for Geoscience Applications Denver, CO and virtual, Sep. 2021
Distributed Acoustic Sensing, Remote Online Sessions for Emerging Seismologists, video of lecture on YouTube remote global audience, Jul. 2021
Why we love arrays for data science, Women in Data Science Worldwide Workshops, video of lecture on YouTube remote global audience, Mar. 2021
An Introduction to Seismology with Distributed Acoustic Sensing, AGU Fall Meeting, video of same material recorded for YouTube Washington, DC, Dec. 2018

Research Advising

Graduate Student Theses Supervised

Ahmad Tourei, Geosciences Ph.D. student VT, Sep. 2021 - present
co-advised with J.A. Hole
Hafiz Issah, Mathematics M.S. student VT, Aug. 2021 - present
Sarah Morgan, Mathematics M.S. student VT, Aug. 2020 - present
Julius Grimm, Applied Geophysics M.S. IDEA League, degree awarded Aug. 2021
co-advised with P. Paitz, P. Edme, A. Fichtner, F. Walter
Joseph Kump, Mathematics M.S. (thesis link) VT, degree awarded May 2021

Undergraduate Students Supervised

Samantha Paulus, CMDA and Nanoscience major VT, Spring 2021-present
Firaol Woldemariam, CMDA major VT, Spring 2021-present

Tony Artis, CMDA major — VT, Spring 2020-present
Anu Trivedi, Mathematics major — VT, Fall 2019-May 2021
Srikanth Jakkampudi, Mathematics and CMDA major — VT, Fall 2019-Spring 2020
Sarah Morgan, Mathematics major — VT, Fall 2019-Spring 2020
Tarun Nadipalli, CMDA major — VT, Spring 2019
Ethan Williams (coadvised, B. Biondi) Geophysics & Music major, Stanford, Summer 2016

Graduate Thesis Committee Member

Derrick Chambers, Ph.D. with J. Shragge, Geophysics — CSM, degree in progress
Joseph Mjehovich, M.S. with G. Jin, Geophysics — CSM, degree in progress
Junzhu Shen, Ph.D. with T. Zhu, Geosciences — Penn State, degree in progress
Nhat Nguyen, Ph.D. with L. Massa, AOE — VT, degree in progress
Zachary Hileman, Ph.D. with G. Pickrell, MSE — VT, degree in progress
Kaleigh Yost, Ph.D. with R. Green, CEE — VT, degree in progress
Amin Baghbadorani, Ph.D. with J. Hole, Geosciences — VT, degree in progress
ThaoVy Nguyen, M.S. with R. Hewett, Mathematics — VT, degree awarded May 2021
Taewon Cho, Ph.D. with J. Chung, Mathematics — VT, degree awarded May 2021

Teaching

Instructor, BEPUR: Broadening Engagement and Participation in Undergraduate Research (VT, MATH 2984) — Fall 2021
Project Mentor, Capstone Project (VT, CMDA 4864) — Fall 2021
Senior team project on optimal detection of targets in GPR data
Instructor, BEPUR: Broadening Engagement and Participation in Undergraduate Research (VT, MATH 2984) — Spring 2021
Instructor, CS Foundations for CMDA (VT, CMDA 3634) — 2 sections, Fall 2020
Instructor, CS Foundations for CMDA (VT, CMDA 3634) — Spring 2020
Instructor, Extreme-Scale Inverse Problems (VT, MATH 5984) — Fall 2019
Instructor, Integrated Quantitative Science I (VT, CMDA 2005) — Fall 2019
Project Mentor, Capstone Project (VT, CMDA 4864) — Fall 2019
Senior team project on removing footstep signals from urban seismic data
Instructor, CS Foundations for CMDA (VT, CMDA 3634) — Spring 2019
Instructor, Integrated Quantitative Science I (VT, CMDA 2005) — Fall 2018
ICME Teaching Fellow 2016-2018, status to recognize student teaching experience
Course assistant, Intro. to Scientific Computing (Stanford, CME 108) — Winter 2016
Project Mentor, Projects in App. & Comp. Math (Stanford, CME 181) — Spring 2015
Undergrad project on statistical analysis of bicycle sharing network data
Instructor, Introduction to Scientific Python (Stanford, CME 193) — Winter 2015
Instructor, Short course on Python at SIAM Conference on Geosciences, — June 2015
Project Mentor, Projects in App. & Comp. Math (Stanford, CME 181) — Winter 2014
Undergrad project on tsunami modeling using Hawaiian bathymetry
STEM Tutor, Longhorn Center for Academic Excellence — Aug. 2011-May 2012
UT-Austin Division of Diversity and Community Engagement
Tutored students in introductory math, statistics, physics, and chemistry courses
Documented tutoring and workshops for grant application materials

Professional Service, Outreach

Associate editor, *Computers & Geosciences* — Nov. 2018-present
Guest Editor, IEEE CiSE: DOE Computational Science Graduate Fellowship Research Showcase — Jun. 2021-present
Member, SEG JEDI Committee — Apr. 2021-present
Committee member, SEG Research Committee — Oct. 2018-present
Member, Virginia Tech Math Department Colloquium Committee — Aug. 2020 - present
Advisor, Undergraduate Mathematics Majors, Traditional Option — Aug. 2020 - present
Member, CMDA Computing Curriculum Committee — Aug. 2018 - present

Steering Committee Member, NSF DAS Research Coordination Network
Co-leader of Machine Learning Working Group Feb. 2020-present
Co-leader of RCN-affiliated virtual workshops

Co-organizer, Speakers and Undergraduate Research Engagement Feb. 2019 - present
Program to guide female undergrad math students through first research projects, and bring diverse women mathematicians for research talks and career path discussions

Reviewer: *Seismological Research Letters, American Geophysical Union Books, Geophysical Journal International, Geophysics, Computers & Geosciences, Marine Geophysical Research, Journal of Computational Science, Journal of Environmental and Engineering Geophysics, Interpretation, PASC Conference, Geophysical Research Letters, Bulletin of the Seismological Society of America, SEG Annual Meeting Technical Program, The Leading Edge*

Co-convener, AGU Fall Meeting session "Observing Wave Field Gradients in Seismology-Applications, Instrumentation and Theory" to occur Dec. 2021

Co-organizer, SEG Post-convention workshop "Distributed Fiber-Optic Sensing in Applied Geophysics" Oct. 2021

Co-organizer, GAGE/SAGE Short course "Distributed Acoustic Sensing: Scientific Frontiers and Community Needs" Aug. 2021

Instructor, Remote Online Sessions for Emerging Seismologists (ROSES) lesson on Distributed Acoustic Sensing July 2021

Panelist, AGU EPSP Connects: Surface processes applications of environmental seismology and distributed acoustic sensing (DAS) Q&A May 2021

Member, SEG Equity in Process Task Force Aug. 2020-Apr. 2021

Faculty sponsor/organizer, 3rd Women in Data Science Blacksburg at Virginia Tech conference April 2021

Panelist, Virginia Tech Assoc. for Women in Computing research panel Mar. 2021

Member, DOE CSGF Screening Committee 2020, 2021

Session Co-Chair, AGU Fall Meeting session on Data Science and Machine Learning for Natural Hazard Sciences Dec. 2020

Panelist, discussion on women in geosciences for Diversity and Inclusion in Geoscience course at University of Wyoming Oct. 2020

Co-Organizer, SEG Annual International Meeting Post-convention Workshop on DAS: Advances in Fiber Optic Sensing Over the Last Decade Oct. 2020

Speaker, UT-Austin Dean's Scholars Honors Program Friday Lunch Talk Sep. 2020

Co-Lead, DAS Virtual Workshop and Tutorial Aug. 2020
Three-afternoon virtual workshop and tutorial supported by DAS RCN and IRIS;
8 speaker presentations with extensive discussion, and 150-250 participants/day;
Developed new Jupyter notebooks for hands-on coding with public DAS data;
Managed Slack channel for participants to network/discuss with 10 Workshop Guides.

Member, Virginia Tech Math Dept. Technology Committee Aug. 2018 - Aug. 2020

Judge, Virginia Tech Socially Determined COVID-19 Social Data Project Apr. 2020

Faculty sponsor/organizer, 2nd Women in Data Science Apr. 2020
Blacksburg at Virginia Tech conference (converted to online event with 3 speakers)

Panelist, Virginia Tech Assoc. for Women in Mathematics internship panel Feb. 2020

Session co-chair, SEG/EAGE Workshop on Geophysical Aspects of Smart Cities, session on Fiber-based Distributed Acoustic Sensing Dec. 2019

Co-Organizer, SEG Annual International Meeting Post-convention Workshop on Real-time Processing for Large-Scale Streaming Seismic Data, agenda Sep. 2019

Chair, Session on 'Distributed Acoustic Sensing: VSP, Modeling and Imaging Approaches' at SEG Annual International Meeting Sep. 2019

Mentor, DOE CSGF High Performance Computing Workshop Jul. 2019

Panelist, Early Career Panel, DOE CSGF Annual Program Review Jul. 2019

Mentor, Student mentoring program run by Virginia Tech Sep. 2018 - May 2019
chapter of American Women in Mathematics

Co-Organizer, Session on 'Photonic and Nonintertial Seismology' at Seismological Society of America Annual Meeting Apr. 2019
Speaker, Virginia Tech Undergraduate Math Club Apr. 2019
Volunteer, ASA DataFest at Virginia Tech Apr. 2019
Faculty sponsor/organizer, 1st Women in Data Science conference at VT Feb. 2019
Organizer, Session on 'Computational Advances for Large-Scale Geophysical Data' at SIAM CS&E Feb. 2019
Judge, CMDA Fall Data Competition at Virginia Tech Nov. 2018
Panelist, UT-Austin Association for Women in Mathematics career panel Nov. 2018
Speaker, UT-Austin Undergraduate Math Club Nov. 2018
Special section associate editor, *Interpretation* 2018
Special issue on 'Distributed Acoustic Sensing and its Oil Field Potential'
Mentor, ICME first-year mentoring program Sep. 2017-Jun. 2018
Co-organizer, Stanford Computational Geosciences Seminar Jan.-Mar. 2018
Brought in 9 speakers from outside Stanford, organized 1 hr. course EARTH 310
Co-chair, Session on 'Earth Model Building Strategies and Inputs' at SEG Annual International Meeting Sep. 2017
Co-organizer, SEG Data Analytics Post-Convention Workshop Sep. 2017
Invited early-career speakers and moderated panel on data science education
Student panel Stanford Aeronautics & Astronautics faculty search Spring 2017
Mentor, Stanford Women in Math Mentoring Oct. 2016-Jun. 2017
President, Stanford SEG student chapter 2014-2015

Skills

Preferred programming languages: C/C++ and Python
HPC tools: MPI, openMP, CUDA, TBB
Profiling tools: Tau, HPM, NVCC, Vampir
Scientific tools: MATLAB, Mathematica, COMSOL, IDL
Environment and development tools: Docker, Singularity, Doxygen, Git, Jupyter Notebooks, Google Cloud Compute Engine, Amazon Web Services

Industry Experience

High Performance Computing Internship Summer 2016
Schlumberger, Menlo Park, CA
Mentored by A. Lichnewsky and R.G. Clapp, and supervised by C. Boneti
Benchmarked, co-developed, and tested compression scheme for HPC applications

Areal Monitoring Internship Summer 2015
Shell Projects & Technology, Houston, TX
Mentored by J. Lopez and supervised by P. Wills
Applied machine learning techniques to analyze data and predict production at steam-driven bitumen field in Peace River
Regularly consulted with reservoir engineer to develop useful products

DOE CSGF Practicum in Weapons & Complex Integration Summer 2014
Lawrence Livermore National Laboratory, Livermore, CA
Supervised by S. Langer
Improved memory performance of pf3D laser-plasma code by combining physics operators
Evaluated hardware compression needs

Computational Physics Internship 2010-2011
Nanohmics, Inc. Austin, TX
Project funded through U.S. Department of Defense, PI B. Zollars
Implemented unstructured adaptive mesh methods for finite element code to model liquid erosion of coated lenses