Karianne J. Bergen, Ph.D.

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PROFESSIONAL EXPERIENCE

2021 –   **Assistant Professor**, Brown University, Providence, RI
Data Science Institute and Department of Earth, Environmental and Planetary Sciences
Department of Computer Science, by courtesy

2020   **Visiting Assistant Professor**, Brown University, Providence, RI

2018-20   **Harvard Data Science Initiative Postdoctoral Fellow**, Harvard University, Cambridge, MA
Department of Computer Science, School of Engineering and Applied Sciences
Department of Earth and Planetary Sciences, Faculty of Arts and Sciences

2009-11   **Assistant Technical Staff (Data Scientist)**, MIT–Lincoln Laboratory, Lexington, MA
Biological and Chemical Defense Systems Group

EDUCATION

2018   **Ph.D. in Computational and Mathematical Engineering,** Stanford University, Stanford, CA
Thesis: Big Data for Small Earthquakes: Detecting Earthquakes over a Seismic Network with
Waveform Similarity Search

2015   **M.Sc. in Computational and Mathematical Engineering,** Stanford University, Stanford, CA

2009   **B.Sc. in Applied Mathematics**, Brown University, Providence, RI

PUBLICATIONS   [++trainee, *equal contribution]

Journal Publications

1. **P. Van Katwyk**[++], B. Fox-Kemper, H. Seroussi, S. Nowicki, and **K. J. Bergen**. (2023) A variational LSTM emulator of sea level contribution from the Antarctic ice sheet. *Journal of Advances in Modeling Earth Systems,* 15(12). DOI: 10.1029/2023MS003899
2. H. Wang, […], **P. Van Katwyk**[++]**, K. Bergen**, et al. (2023). Scientific discovery in the age of artificial intelligence. *Nature*. DOI: 10.1038/s41586-023-06221-2
3. S. J. Arrowsmith, J. MacCarthy, D. Trugman, **K. J. Bergen**, D. Lumley & B. Magnani (2022). Big Data Seismology. *Reviews of Geophysics*, 60(2). DOI: 10.1029/2021RG000769.
4. **K. J. Bergen**, P. A. Johnson, M. V. de Hoop & G. C. Beroza (2019). Machine learning for data-driven discovery in solid Earth geoscience. *Science*, 363(6433). DOI: 10.1126/science.aau0323. Reprinted (in Chinese) in *Translated World Seismology*, 1, 1-21, 2020.
5. C. E. Yoon, **K. J. Bergen**, K. Rong, H. Elezabi, W. L. Ellsworth, G. C. Beroza, P. Bailis & P. Levis (2019). Unsupervised large-scale search for similar earthquake signals. *Bulletin of the Seismological Society of*

America, 109(4): 1451-1468. DOI: 10.1785/0120190006.

6. **K. J. Bergen** & G. C. Beroza (2018). Detecting Earthquakes over a Seismic Network using Single-Station Similarity Measures. *Geophysical Journal International*, 213(3), 1984-1998. DOI: 10.1093/gji/ggy100. <u>Winner</u>: Geophysical Journal International 2018 Student Author Award.

7. **K. J. Bergen** & G. C. Beroza (2018). Earthquake fingerprints: Extracting waveform features for similarity-based earthquake detection. *Pure and Applied Geophysics* 176(3). DOI: 10.1007/s00024-018-1995-6

8. C. E. Yoon, O. O'Reilly, **K. J. Bergen**, & G. C. Beroza (2015). Earthquake Detection Through Computationally Efficient Similarity Search. *Science Advances* 1(11). DOI: 10.1126/sciadv.1501057. <u>Reprinted</u> (in Chinese) in *Translated World Seismology*, 6, 496-516, 2017.

Conference Proceedings

15. K. Rong, C. E. Yoon, **K. J. Bergen**, H. Elezabi, P. Bailis, P. Levis & G. C. Beroza (2018). Locality-Sensitive Hashing for Earthquake Detection: A Case Study of Scaling Data-Driven Science. *Proceedings of the Conference on Very Large Data Bases (VLDB),* 11(11): 1674–1687. DOI: 10.14778/3236187.3236214

16. **K. Bergen**, C. Yoon, & G. Beroza (2016). Scalable Similarity Search: A New Approach for Large-Scale Earthquake Detection. Proceedings of the International Conference on Similarity Search and Applications (SISAP), *Lecture Notes in Computer Science*, Vol. 9939. DOI: 10.1007/978-3-319-46759-7_23

17. J. J. Braun, **K. Bergen**, & T. J. Dasey (2011). Inner Rehearsal Modeling for Cognitive Robotics. *Proceedings of SPIE*, Vol. 8064, 80640A. DOI: 10.1117/12.888000

18. J. J. Braun, A. Hess, Y. Glina, E. C. Wack, **K. Bergen**, T. J. Dasey, R. M. Mays, & J. Strawbridge (2010). Information fusion of standoff and other information for biodefense decision support. *Proceedings of SPIE*, Vol. 7665, 76650C. DOI: 10.1117/12.852817

19. J. J. Braun, A. Hess, Y. Glina, E. C. Wack, **K. Bergen**, T. J. Dasey, R. M. Mays, & J. Strawbridge (2010). Approaches to information fusion with spatiotemporal aspects for standoff and other biodefense information sources. *Proceedings of SPIE*, Vol. 7710, 771003. DOI: 10.1117/12.852862

Technical Reports

13. D. Reiter, V. Napoli, S. Arrowsmith*, **K. Bergen***, G. Beroza*, C. DeGroot-Hedlin*, M. Hedlin*, K. Koper*, A. Mueen*, N. Nakata*, K. Pankow*, Z. Peng*, S. Ravela*, W. Rodi*, B. Stump*, J. Williams* & S.-H. Yoo* (2021). Machine Intelligence for Nuclear Explosion Monitoring: A Strategic Plan to Guide Research and Development Through 2025. *White Paper*, prepared for Air Force Research Laboratory.

14. F. El-Masri*, **K. Bergen***, O. Addai*, P. Liu*, S. Chowdhury*, X. Huang*, M. Wolff, & K. Lopiano (2014). Analysis of Self-Reported Health Outcomes from Web Based Media Sources. CRSC Technical Report TR14-11, *Twentieth Mathematical and Statistical Modeling Workshop for Graduate Students*, P. Gremaud, I.C.F. Ipsen, & R. Smith.

Other Publications

15. S. J. Arrowsmith, D. T. Trugman, **K. Bergen**, and B. Magnani (2022). The Big Data Revolution Unlocks New Opportunities for Seismology. *Eos*, 103. DOI: 10.1029/2022EO225016. Published on 9 June 2022.

16. **K. J. Bergen***, T. Chen* & Z. Li* (2019). Preface to SRL Special Focus Section on Machine Learning in Seismology. *Seismological Research Letters* 90(2A): 466-480. DOI: 10.1785/0220190018.

Code Repositories

FAST: End-to-end earthquake detection pipeline via efficient time series similarity search
https://github.com/stanford-futuredata/FAST

Media Coverage

Shazam for Seismologists? How a new data mining technique is shaking up earthquake science (May 12, 2019). *Yale Scientific Magazine*

Algorithms spot millions of California's tiniest quakes in historical data (Apr 18, 2019). *Nature*

What can machine learning tell us about the solid Earth? (Mar 21, 2019) Featured in *Stanford News*

Interview with KRON4 News – Bay Area. (Dec 11, 2015)

Stanford Scientists develop "Shazam for Earthquakes" (Dec 4, 2015). Featured in *Stanford News, IEEE Spectrum, Smithsonian Magazine*, NBC News

PRESENTATIONS [# virtual]

Invited Talks

2023

National Academies Committee on Solid Earth Geophysics Fall 2023 Meeting[#]. Artificial Intelligence and Machine Learning in Geophysics: Are We Beyond the Black Box? *Machine Learning for data-driven discovery in geosciences: progress and opportunities.*

School of Earth and Space Exploration, Arizona State University, Tempe, AZ[#]. *Machine Learning for data-driven discovery in geosciences: progress and challenges ahead.*

Computability in Europe (CiE), Computational Science Session, Batumi, Georgia[#]. *Earthquake monitoring: Big data, deep learning and explainable AI.*

Women in Data Science Conference: Data Science in Crises Management, American University of Beirut, Lebanon[#]. *Earthquakes, Big Data and Explainable AI.*

Ground-Based Nuclear Explosion Monitoring Seminar, Sandia National Laboratory, Albuquerque, NM[#]. *Explainable AI in Seismology: An interpretable convolutional neural network for earthquake detection.*

2022

NSF AI Institute for Data-Driven Discovery in Physics Seminar, Carnegie Mellon University, Pittsburgh, PA[#]. *Earthquake monitoring, Deep Learning and Explainable AI.*

International Symposium: Frontier of Understanding Earth's Interior and Dynamics, Tohoku University, Sendai, Japan[#]. *Big Data Analysis in Geoscience.*

Earthquake Science Seminar, US Geological Survey, Menlo Park, CA[#]. *Big data for small earthquakes: Data mining, deep learning and explainable AI.*

Symposium on Artificial Intelligence and Earthquake Engineering, Earthquake Engineering Research Institute (EERI) San Diego Chapter, CA[#]. *Explainable AI in Seismology: An interpretable convolutional neural network for earthquake detection.*

Njord Center Seminar, University of Oslo, Norway[#]. *Big data for small earthquakes: Data mining, deep learning and explainable AI.*

Geoscience Seminar, University of Montana, Missoula, MT[#]. *Big data for small earthquakes: Data mining, deep learning and explainable AI.*

2021

Scientific Computing and Numerics Seminar, Cornell University, Ithaca, NY[#]. *Big data for small earthquakes: Data mining, deep learning and explainable AI.*

Department of Earth, Atmospheric and Planetary Sciences, MIT, Cambridge, MA. *Big data for small earthquakes: Data mining, deep learning and explainable AI.*

Brazilian Seismology Symposium, International Congress of the Brazilian Geophysical Society, Rio de Janeiro, Brazil[#]. *Explainable AI for Seismology: An interpretable convolutional neural network for earthquake detection.*

Department of Geology and Geophysics, University of Utah, Salt Lake City, UT[#]. *Big data for small earthquakes: Data mining, deep learning and explainable AI.*

Geological Society of Washington, DC[#]. *Advancing solid Earth geoscience with machine learning.*

2020

Michigan Institute for Data Science Consortium for Researchers in Training, University of Michigan, Ann Arbor, MI[#]. *Shaking up Earthquake Science in the age of Big Data.*

Distributed Acoustic Sensing Virtual Workshop and Tutorial, Incorporated Research Institutions for Seismology (IRIS)[#]. *DAS and big scientific data analysis.*

Life on Planet Earth: Above and Below Workshop, Mathematical Biosciences Institute, The Ohio State University, Columbus, OH[#]. *Event detection in big sensor data: Applications in earthquake seismology and beyond.*

Data Science Institute and Department of Computer and Information Sciences, University of Delaware, Newark, DE[#]. *Big data for small earthquakes: Computational challenges in large-scale earthquake detection.*

Faculty of Computing and Data Science, Boston University, Boston, MA[#]. *Big data for small earthquakes: Computational challenges in large-scale earthquake detection.*

Department of Electrical and Computer Engineering, University of California, Santa Barbara, CA. *Big data for small earthquakes: Computational challenges in large-scale earthquake detection.*

Department of Earth, Ocean and Atmospheric Sciences, University of British Columbia, Vancouver, Canada. *Big data for small earthquakes: Computational challenges in large-scale earthquake detection.*

Data Science Initiative and Department of Earth, Environmental and Planetary Sciences, Brown University, Providence, RI. *Big data for small earthquakes: Computational challenges in large-scale earthquake detection.*

Department of Geophysics, Colorado School of Mines, Golden, CO. *Big data for small earthquakes: Computational challenges in large-scale earthquake detection.*

Oden Institute for Computational Sciences and Engineering and Department of Statistics and Data Science, University of Texas at Austin, TX. *Big data for small earthquakes: Computational challenges in large-scale earthquake detection.*

Department of Computational Mathematics, Science and Engineering, Michigan State University, East Lansing, MI. *Big data for small earthquakes: Computational challenges in large-scale earthquake detection.*

2019 and earlier (selected)

Women in Data Science at Stanford Earth Workshop, Stanford University, CA. *Earthquake monitoring in the age of Big Data: Challenges and opportunities.*

Microsoft Research New England, Cambridge, MA. *Shaking up seismology: Improving earthquake detection capabilities with locality-sensitive hashing.*

National Academies Committee on Seismology and Geodynamics Fall Meeting, Washington, DC. *Machine learning for data-driven discovery in solid Earth geosciences.*

Congressional briefing, hosted by the Seismological Society of America, Washington, D.C. *Machine Learning in Seismology: Using AI to Improve Earthquake Monitoring.*

Conference on Neural Information Processing Systems (NeurIPS), Workshop on Machine Learning for Geophysical and Geochemical Signals, Montreal, Canada. *Towards data-driven earthquake detection: Extracting weak seismic signals with locality-sensitive hashing.*

IRIS Workshop: Foundations, Frontiers & Future Facilities for Seismology, Albuquerque, NM. *Improving earthquake detection with data mining and machine learning.*

Institute of Mathematical and Computational Engineering, Pontificia Universidad Católica de Chile, Santiago, Chile. *Scalable Similarity Search for Earthquake Detection.*

Invited Panelist

Dynamic Data Driven Applications Systems (DDDAS) Workshop, MIT, Cambridge, MA. *Seismic and Nuclear Explosion Monitoring Panel.* (2022[#])

Conference on Neural Information Processing Systems (NeurIPS). Workshop Panel, *AI for Science: Mind the Gaps.* (2021[#])

Seismological Society of America Annual Meeting. Plenary Panel, *Machine Learning in Seismology: Where are we now and where are we going?* (2021[#])

Trainee Presentations

American Geophysical Union 2023 Fall Meeting. Enhancing CMIP6 Model's Sea Ice Concentration with Machine Learning on the Northern Sea Route. Contributed abstract by M. L. Rocha (2023)

American Geophysical Union 2023 Fall Meeting. *Variational LSTM emulators of sea level contribution from the Antarctic and Greenland ice sheets.* Contributed abstract by P. Van Katwyk. (2023)

International Liège Colloquium on Ocean Dynamics: Machine Learning and Data Analysis in Oceanography, University of Liège, Belgium. *Emulation of ISMIP6 Antarctic sea level contribution and ensemble distributions using time series neural networks.* Contributed talk by P. Van Katwyk. (2023)

SAGE/GAGE Community Science Workshop, Pittsburgh, PA. *Normalizing flows for density estimation and uncertainty quantification in Earth Data.* Contributed poster by P. Van Katwyk. (2022)

University Talks

Brown University

Geophysics Lunch Bunch, DEEPS. *Machine learning for data-driven discovery in the geosciences: progress and opportunities* (2023); *Big data for small earthquakes: data mining, deep learning and explainable AI* (2021); *Machine learning for data-driven discovery in solid Earth geoscience* (2020)

Applied Math Colloquium. *Big data for small earthquakes: Scalable earthquake detection with locality-sensitive hashing and deep learning.* (2021)

Harvard University

Department of Earth and Planetary Sciences. *Big data for small earthquakes: Shaking up seismology with data science.* (2018)

Stanford University

Earthquake Seismology Group, Department of Geophysics. *How robust is deep learning-based earthquake detection?* (2019)

Thesis defense, Institute for Computational and Mathematical Engineering. *Big data for small earthquakes: Detecting earthquakes over a seismic network with waveform similarity search.* (2018)

TEACHING EXPERIENCE

Brown University

Instructor

- Tackling Climate Change with Machine Learning (EEPS 1720 / DATA 1720)
    Spring 2023 [in-person format]: total enrollment: 17 students (15 undergrad, 2 graduate, 3 auditors)
- Machine Learning for the Earth and Environment (EEPS 1340 / EEPS 1960D / DATA 1340)
    Fall 2023 [in-person format]: total enrollment: 27 students (20 undergrad, 7 graduate)
    Spring 2022 [in-person format]: total enrollment: 24 students (14 undergrad, 10 graduate)
    Spring 2021 [virtual format]: total enrollment: 22 students (12 undergrad, 10 graduate, 1 auditor)

- Probability, Statistics and Machine Learning (DATA 1010)
    Fall 2021 [hybrid/remote-accessible format]: total enrollment: 48 students (1 undergrad, 47 graduate)

Stanford University

Teaching Assistant (Instructor of Record)
- Introduction to Machine Learning (CME 250)
    Winter 2015, Spring 2015, Fall 2015, Winter 2016 (total enrollment: 301 students).
    Developed new 4-week short-course. Responsibilities included designing syllabus, selecting course materials, and co-teaching the material as both a graduate-level course and a week-long workshop for professionals and researchers.

Instructor
- Introduction to Machine Learning, AY 2016-2017
    Developed syllabus and recorded lectures in studio for online course offered by Stanford Foundations in Data Science Affiliates Program by the Stanford Center for Professional Development.

Grader (Teaching Assistant)
- Introduction to Probability and Statistics for Engineers (CME 106), Summer 2012

Workshop Instructor
- Introduction to Machine Learning
    Fundamentals of Data Science Workshop (Jan 2018), Pontificia Universidad Católica, Santiago, Chile
    ICME Summer Short Courses (Aug 2014, Aug 2015), Stanford University
- Applied Linear Algebra
    ICME Math Refresher Course Series (Sept 2013), Stanford University

Guest Lecturer
Machine Learning across the Earth and Planetary Sciences (EPS 268, Oct 2019), Harvard University
Time Series and Prediction (STAT 131, Nov 2018), Harvard University
Know Your Planet: Big Earth (EARTH 1B, Jan 2017, Jan 2018), Stanford University

Pedagogical Training
Sheridan Junior Faculty Teaching Fellows Program, Brown University (AY 2022-2023)
Data Science Course Design Institute, Brown University (2020)

FUNDING AND AWARDS

Grants (awarded)
Co-PI, *Exploring the Promise of AI to Revolutionize Science and Engineering (Scientific Artificial Intelligence Center)*. Office of Naval Research. (2023–2028). $11.3M total, $750,000 Brown.
Co-I, *RII Track-2 FEC: Community-Driven Coastal Climate Research and Solutions (3CRS) for the Resilience of New England Coastal Populations.* NSF EPSCoR. (2023–2027).
Co-PI, *Towards the Smart Interconnected Bay – Artificially intelligent detection of harmful algal blooms in Narragansett Bay, Rhode Island.* Rhode Island Science and Technology Advisory Council (STAC). (2021–2023). $30,000.
Subcontractor, *Machine Intelligence Solutions for Nuclear Explosion Monitoring.* Air Force Research Laboratory (2020–21). $23,745.

Collaborator, *Rockfalls on Mars – Indicators of Seismicity, Impacts or Thermal Fatigue.* Mars Data Analysis, NASA. (2023)

Co-I, *Lunar Structure, Composition, and Processes for Exploration (LunaSCOPE).* Solar System Exploration Research Virtual Institute (SSERVI) Cooperative Agreement, NASA. (2023–2028).

Grants (not selected for funding)

Co-PI, *Evaluating and Improving Physics-Based Feature Transportability Using Machine Learning Approaches.* White paper submission for MINEM program, Air Force Research Laboratory. (2023)

PI, *Ocean Current Forecast Model to Enable Next-Gen Maritime Navigation.* Rhode Island Innovation Voucher Program in collaboration with Newport RI-based start-up Current Lab. (2023)

Co-I, *RII Track-1: Ecological and Societal Impacts of Plastic Degradation Products in Rhode Island's Coastal Ecosystem: Informing Mitigation Strategies and Materials Innovation.* NSF EPSCoR. (2023)

Co-PI, *OCEAN Resources (Ocean Climate Emulation for Adaptation and Natural Resources).* Google.org Impact on Climate Innovations Challenge. (2022)

Co-PI, *Track I – Center Catalyst: Interdisciplinary studies of the physics of slow fault slip and slow slip triggered earthquakes.* NSF Geohazards Center Proposal. (2022)

Co-PI, *Data Science Institute for Subduction Zone Earthquakes and Tsunamis.* NSF Harnessing the Data Revolution Institute Proposal. (2021)

Co-PI, *Real-time monitoring and high frequency sampling of harmful algal blooms.* Rhode Island Sea Grant. (2021)

Co-PI, *Blue Economies Require Healthy Ecosystems: Building Capacity at the Nexus of Clime Change, Marine Plastics, and Emerging Pollutants in the Ocean State.* NSF EPSCoR. (2021)

Fellowships

AAAS Science and Technology Policy Fellowship Finalist (2020, declined).

Harvard Data Science Initiative Postdoctoral Fellowship, Harvard University (2018–20). $268,000.

Stanford Graduate Fellowship in Science and Engineering, Stanford University (2011–15). $213,000.

Teaching Awards

Senior Teaching Fellow, ICME, Stanford University (2016)

Short Course Instructor Award, ICME, Stanford University (2015)

Academic and Professional Recognitions

Sleeping Bear Award for good humor at meetings, Geological Society of Washington (2021)

Student Author Award, Geophysical Journal International (2018)

Student Leadership Award, ICME, Stanford University (2018)

Student Presentation Award, Seismological Society of America Annual Meeting (2016, 2017)

Innovative Research Award, ICME Xpo, Stanford University (2016)

Outstanding Student Paper Award, American Geophysical Union Fall Meeting (2015)

Travel/Workshop Grants

Broadening Participation in Data Mining Workshop, ACM SIGKDD Conference, San Francisco, CA. (2016)

Computing Research Association (CRA-W) Grad Cohort Workshop, San Jose, CA. (2014)

Computing Research Association (CRA-W) Grad Cohort Workshop, Boston, MA. (2013)

TRAINEES

Postdoctoral Research Fellows
Hilarie Sit, Provost's STEM Postdoctoral Program, July 2023 –

Ph.D. Student Research
Anushka Narayanan (EEPS), Fall 2023 –
Peter Van Katwyk (EEPS), Fall 2021 –
    Awards: NSF Graduate Research Fellowship in Geosciences – Artificial Intelligence (2022)
    Topic: *Neural network ice sheet emulators with uncertainty quantification*

Master's Student Research
Qingyan Guo (Data Science), Summer 2021, topic: *out-of-distribution detection*
Yijing Gao (Data Science), Summer 2021, topic: *out-of-distribution detection*
Tianqi Tang (Data Science), Summer 2021, DATA 2050 practicum advisee, topic: *deep scattering networks*
Zhirui Li (Data Science), Summer 2022, topic: *environmental data analysis (STAC)*
Selina Xinyue Wang (Data Science), Fall 2022, topic: *environmental time series forecasting*
Dylan Yang Zheng (Data Science), Fall 2022, topic: *environmental time series forecasting*

Undergraduate Student Research
 Jason Wu (CS/Math), Summer 2023, topic: *environmental data analysis (STAC)*

Graduate Student Committees   [primary advisor is: **IBES Core Faculty, *Elected IBES Fellow]
Caleb Ukaonu (EEPS*), Ph.D. Advisory Committee, 2023–
Anson Cheung (EEPS*), Ph.D. Dissertation Defense Committee, Spring 2023
Sarah Esenther (EEPS**), Ph.D. Preliminary Examination Committee, December 2022
Carol Hundal (EEPS), Ph.D. Preliminary Examination Committee, June 2022
Matt Jones (EEPS), Ph.D. Thesis Advisory Committee, 2022–2023
Ethan Kyzivat (EEPS**), Ph.D. Thesis Advisory Committee, 2020–2023

Undergraduate Advising
Benny Smith (Applied Math), DATA 1150 Data Science Fellow, Spring 2021
Nikolai Stambler (History, Data Science fluency), DATA 1150 Data Science Fellow, Fall 2021
Geordie Young (CS-Economics, Political Science), DATA 1150 Data Science Fellow, Fall 2022

PROFESSIONAL SERVICE

Editorial
  Guest Editor
    Seismological Research Letters – Special Focus Section on Machine Learning in Seismology
  Reviewer
    Advances in Geophysics; Bulletin of the Seismological Society of America; Computers and Geosciences; Geophysical Research Letters; Geophysical Journal International; International Conference on Learning Representations (ICLR) workshop papers; IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing; IEEE Transactions on Circuits and Systems for Video Technology; Journal of Geophysical Research: Solid Earth; Nature Communications; Science; Science Advances; Scientific Reports

Workshops and Conferences

Co-ambassador and Faculty Chair

Women in Data Science (WiDS) Providence Datathon Workshop, Brown University. (2023)

Session Chair/Co-chair

SAGE/GAGE Community Science Workshop, New Horizons in Observation: Innovative Data Collection and Analysis, Pittsburgh, PA. (2022)

Workshop on AI for Earth and Space Sciences (AI4ESS), ICLR. (2022) [virtual]

Moderator

Session on Artificial Intelligence in Earthquake Science, Southern California Earthquake Center (SCEC) Annual Meeting. (2020) [virtual]

Panel on Interpretable Machine Learning for Earth and Space Science, AI4ESS Workshop. (2022) [virtual]

Student Travel and Research Grant Reviewer

Seismology Section Student Travel Grant, AGU Fall Meeting. (2020)

Student Presentation Judge

Outstanding Student Paper Award (OSPA), AGU Fall Meeting. (2020–2021)

Conference Tutorials

Introduction to Machine Learning Workshop and Advanced Machine Learning Workshop, Seismological Society of America (SSA) Annual Meeting, Bellevue, WA. (2022)

Machine Learning for Seismology Workshop, SSA Annual Meeting, Seattle, WA. (2019)

Unsupervised Learning for Geoscience Applications, Machine Learning in Solid Earth Geoscience Conference, Santa Fe, NM. (2019)

Introduction to Machine Learning, SIAM Geosciences Conference, Stanford, CA. (2015)

Review Panels

Short Call Proposals, Geological Survey Ireland, Ireland. (2020)

Mentorship Programs

Geosciences Education and Mentorship Support (GEMS) program, National Association of Geoscience Teachers. *Mentee:* Hayley Woodrich at UIUC (AY22-23), Charlie Warner at RPI (AY23-24)

University Service

Brown University

Panelist, DSI Commencement Forum, Our Data-Driven World: A Brunonian Vision for Data Science. (2023)

Committee on Honorary Degrees. (2021–2024)

Advisory Team for Creation of an Institute for Sustainable Energy at Brown. (2021)

Harvard University

Panelist, Tales from the Battlefront: Q&A Among Survivors and Casualties of the Academic Job Search, Office of Postdoctoral Affairs. (2020)

Departmental Service

Brown University

Director of Postdoctoral Engagement, DSI. (AY 23-24)

Faculty Judge, Brown Computer Science Undergraduate Research Symposium. (2022, 2023)

Ad Hoc Committee on Criteria and Standards for Reappointments, Promotion and Tenure, DEEPS. (2022)

Postdoctoral Fellow Search Committee, DSI. (2022, 2023)

Lecturer Search Committee, DSI. (2022)

Harvard University

Volunteer, Graduate School Applications Assistance Initiative, SEAS Office of Diversity, Inclusion and Belonging. (2020)

Selection Committee, HDSI Public Interest Data Science Summer Fellowship. (2019)

Stanford University

ICME Industrial Affiliates Program: Xtrapolate Roundtable Moderator (2017–2018), Foundations in Data Science Course Lecturer (2016), Summer Workshop Instructor (2014–2015).

Student Volunteer, Women in Data Science Conference. (2016–2017)

Science Communication and Outreach

Presenter, Data Science for Science Teachers Bootcamp, NIH Office of Data Science Strategy. (2020) [virtual]

Presenter, Seismological Society of America briefing on Capitol Hill. (2019)

Classroom speaker (K-12), Skype a Scientist Program. (2018–2023)

Sam D. Bundy Elementary School, Farmville, NC; Academy of the Sacred Heart, New Orleans, LA; Turtle River Montessori, Jupiter, FL; McIntosh Middle School, McIntosh, SD; Garden Spot Middle School, New Holland, PA; Frank Ward Strong School, Durham, NC.

Professional Development

Workshop for Early Career Geoscience Faculty, On The Cutting Edge program, National Association of Geoscience Teachers and National Science Foundation. (2021)

Diversity and Inclusion Training

Diversity, Inclusion and Belonging Trainings: Allyship and Calling in vs. Calling out, Harvard School of Engineering and Applied Sciences. (2020)

New England Graduate Women in Science and Engineering Retreat: Empowering Individuals to Foster an Inclusive Campus Climate. (2019)

Media Interviews

TWIML Podcast, Machine Learning for Earthquake Seismology with Karianne Bergen. (Jan 20, 2022)

A Promising Forecast for Predictive Science, *EoS.* (Feb 25, 2021)

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Google Scholar: https://scholar.google.com/citations?user=nQbmcDUAAAAJ&hl=en

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