

# Kyle Bradbury

Curriculum Vitae | Applied machine learning researcher and educator

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I develop and apply machine learning techniques to better understand and manage energy and climate resources. My current research interests include developing scalable computer vision techniques for assessing energy resources, infrastructure, and access globally through the use of publicly available remote sensing data. Methodologically, I investigate how to overcome the challenge of distribution shift in computer vision through novel training paradigms that require less labeled data. The vision for this work is to advance machine learning methodologies and apply them to solve energy and climate system challenges through the development of open source, widely-applicable computational tools.

## Appointments

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- 2020-present**      **Assistant Research Professor**, Electrical & Computer Engineering  
Secondary Appointment, Nicholas School of the Environment (2023-present)  
Director, Energy Data Analytics Lab, Nicholas Institute for Energy, Environment & Sustainability  
Masters of Interdisciplinary Data Science faculty member  
Duke University
- 2015-2020**      **Senior Research Associate**, Energy Initiative  
Lecturing Fellow, Electrical & Computer Engineering (2016-2020)  
Managing Director, Energy Data Analytics Lab  
Duke University
- 2013-2014**      **Postdoctoral Fellow**, Energy Initiative  
Duke University

## Education

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- 2009-2013**      **Doctor of Philosophy** | Duke University  
Area of Study:    Energy Systems Modeling, Division of Earth and Ocean Sciences  
Advisor:        Lincoln F. Pratson  
Dissertation:    The potential of energy storage systems for generation adequacy
- 2007-2008**      **Master of Science** | Duke University  
Area of Study:    Signal Processing & Machine Learning, Dept. of Electrical & Computer Engineering  
Advisor:        Leslie M. Collins  
Research:        Machine learning algorithms for landmine detection using ground penetrating radar
- 2003-2007**      **Bachelor of Science in Electrical Engineering** (*summa cum laude*) | Tufts University  
Area of Study:    Electrical & Computer Engineering  
Advisor:        Joseph P. Noonan  
Research:        Image-based anomaly detection and secure communication systems

## Publications

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### Journal articles

- D. Preiss, J. Sperling, R. Huang, **K. Bradbury**, T. Nechyba, R. Calderbank, G. Herschlag, J. S. Borg (2024). Where Data Science and the Disciplines Meet: Innovations in Linking Doctoral Students with Masters-Level Data Science Education. *Harvard Data Science Review*. [\[article\]](#)
- C. Robinson, **K. Bradbury**, and M. Borsuk (2024). Remotely sensed above-ground storage tank dataset for object detection and infrastructure assessment. *Scientific Data*, 11(1), p.67. [\[article\]](#)
- C. Yaris, B. Huang, **K. Bradbury**, and J.M. Malof (2023). Randomized Histogram Matching: A Simple Augmentation for Unsupervised Domain Adaptation in Overhead Imagery. *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing*, 17, 1988-1998. [\[article\]](#)

- C. Kornfein, F. Willard, C. Tang, S. Jain, J.M. Malof, S. Ren, and **K. Bradbury (2023)**. Closing the Domain Gap—Blended Synthetic Imagery for Climate Object Detection. *Environmental Data Science*, 2, e39. [[article](#)]
- Z. D. Calhoun, S. Lahrichi, S. Ren, J.M. Malof, and **K. Bradbury (2022)**. Self-Supervised Encoders Are Better Transfer Learners in Remote Sensing Applications. *Remote Sensing*, 14(21), p.5500. [[article](#)]
- W. Hu, **K. Bradbury**, J.M. Malof, B. Li, B. Huang, A. Streltsov, K.S. Fujita, and B. Hoen (2022). What you get is not always what you see—pitfalls in solar array assessment using overhead imagery. *Applied Energy*, 327, p.120143. [[article](#)]
- S. Ren, W. Hu, **K. Bradbury**, D. Harrison-Atlas, L.M. Valeri, B. Murray, and J.M. Malof (2022). Automated Extraction of Energy Systems Information from Remotely Sensed Data: A Review and Analysis. *Applied Energy*, 326, p.119876. [[article](#)]
- Y. Xu, B. Huang, X. Luo, **K. Bradbury** and J.M. Malof (2022). SIMPL: Generating Synthetic Overhead Imagery to Address Custom Zero-Shot and Few-Shot Detection Problems. *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing*, 15, pp.4386-4396. [[article](#)]
- S. Ren, J.M. Malof, R. Fetter, R. Beach, J. Rineer, and **K. Bradbury (2022)**. Utilizing geospatial data for assessing energy security: Mapping small solar home systems using unmanned aerial vehicles and deep learning. *ISPRS International Journal of Geo-Information*, 11(4), p.222. [[article](#)]
- B. Huang, J. Yang, A. Streltsov, **K. Bradbury**, L. M. Collins and J. Malof (2021). GridTracer: Automatic Mapping of Power Grids using Deep Learning and Overhead Imagery. *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing*. [[article](#)]
- A. Streltsov, J.M. Malof, B. Huang, and **K. Bradbury (2020)**. Estimating residential building energy consumption using overhead imagery. *Applied Energy*, 280, p.116018. [[article](#)]
- K. Bradbury**, R. Saboo, T. Johnson, J. Malof, W. Zhang, A. Devarajan, L. Collins, and R. Newell (2016). Distributed Solar Photovoltaic Array Location and Extent Dataset for Remote Sensing Object Identification. *Scientific Data*, 3. [[article](#)]
- J. M. Malof, **K. Bradbury**, L. Collins, and R. Newell (2016). Automatic detection of solar photovoltaic arrays in high resolution aerial imagery. *Applied Energy*, 183, 229-240. [[article](#)]
- K. Bradbury**, L. Pratson, and D. Patiño-Echeverri (2014). Economic viability of energy storage systems based on price arbitrage potential in real-time US electricity markets. *Applied Energy*, vol. 114, pp. 512–519. [[article](#)]

#### Book chapters

- K. Bradbury (2018)**. How Data Science Can Enable the Evolution of Energy Systems. Chapter in *Digital Decarbonization Promoting Digital Innovations to Advance Clean Energy Systems*. Ed. Varun Sivaram. New York, New York: Council on Foreign Relations, pp. 73-81. [[book](#)]

#### Conference publications & presentations

- B. Lancellotti, A. Davitt, K. Raniga, D. Moore, Z. Doctor, I. Saraswat, T., So, E. Reilly, T. Gowdy, P. Markakis, J.M. Malof, **K. Bradbury**, and G. McCormick (2025). Enabling Actionable Emissions Tracking with Climate TRACE: High-Resolution Global Emissions Data with Timely Updates. GC22C-08. Presented at *AGU25*, 15-19 Dec 2025. [[presentation abstract](#)]
- P. Markakis, T. Gowdy, J. M. Malof, L. M. Collins, A. Davitt, and **K. Bradbury (2024)**. Generating High-Resolution Global Building Emissions Estimates Using Bottom-Up Modeling and Machine Learning. B53A-1721. Presented at *AGU24*, 9-13 Dec 2024. [[poster abstract](#)]
- B. Lancellotti, A. Davitt, C. Lewis, L. Sridhar, K. Raniga, P. Thomas, D. Moore, Z. Doctor, E. Nguyen, I. Saraswat, T. So, E. Reilly, M. Hughes, T. Gowdy, P. Markakis, J.M. Malof, **K. Bradbury**, and G. McCormick (2024). Closing Major Information Gaps in Global Greenhouse Gas Emissions Tracking Using Remote Sensing and AI: The Climate TRACE Coalition. GC22C-08. Presented at *AGU24*, 9-13 Dec 2024. [[presentation abstract](#)]

- S. Lahrichi, Z. Sheng, S. Xia, **K. Bradbury**, and J.M. Malof (2024). GeoNet: A Global Dataset and Foundation Model for Deep Learning on Optical Satellite Imagery. IN53D-06. Presented at AGU24, 9-13 Dec 2024. [[poster abstract](#)]
- M. Hakizimana, E. Mavis, Y. Chiu, J. M. Malof, **K. Bradbury** (2024). Enhanced Remote Sensing Model Performance through Self-supervised Learning with Multi-spectral Data. Presented at IGARSS 2024-2024 IEEE International Geoscience and Remote Sensing Symposium. IEEE. [[paper](#)]
- S. Ren, F. Luzi, S. Lahrichi, K. Kassaw, L. M. Collins, **K. Bradbury**, and J. M. Malof (2024). Segment anything, from Space? In *Proceedings of the IEEE/CVF Winter Conference on Applications of Computer Vision* (pp. 8355-8365). [[paper](#)]
- P. Markakis, J. M. Malof, T. Gowdy, L. M. Collins, A. Davitt, G. Volpato, and **K. Bradbury** (2023). High-resolution Global Building Estimation using Satellite Imagery. Presented at the 2023 Neural Information Processing Systems (NeurIPS) Climate Change AI Workshop. [[poster](#)]
- F. Luzi, A. Gupta, L. M. Collins, **K. Bradbury**, and J. M. Malof (2023). Transformers For Recognition In Overhead Imagery: A Reality Check. In *Proceedings of the IEEE/CVF Winter Conference on Applications of Computer Vision* (pp. 3778-3787). [[paper](#)]
- C. Kornfein, F. Willard, C. Tang, Y. Long, S. Jain, J. M. Malof, S. Ren, and **K. Bradbury** (2022). Closing the Domain Gap—Blended Synthetic Imagery for Climate Object Detection. In *2022 Neural Information Processing Systems (NeurIPS) Climate Change AI Workshop*. [[paper](#)]
- W. Hu, T. Feldman, E. Lin, J. L. Moscoso, Y. J. Ou, N. Tarn, B. Ye, W. Zhang, J. M. Malof, **K. Bradbury** (2021). Synthetic Imagery Aided Geographic Domain Adaptation for Rare Energy Infrastructure Detection in Remotely Sensed Imagery. In *2021 Neural Information Processing Systems (NeurIPS) Climate Change AI Workshop*. [[paper](#)]
- W. Hu, T. Feldman, Y. J. Ou, N. Tarn, B. Ye, Y. Xu, J. M. Malof, **K. Bradbury** (2021). Wind Turbine Detection with Synthetic Overhead Imagery. In *2021 IEEE International Geoscience and Remote Sensing Symposium IGARSS* (pp. 4908-4911). IEEE. [[paper](#)]
- V. Nair, P. Rhee, B. Huang, **K. Bradbury**, J. M. Malof (2020). Designing synthetic overhead imagery to match a target geographic region: preliminary results training deep learning models. *Presented at the 2020 IEEE International Geoscience and Remote Sensing Symposium*. [[paper](#)][[code](#)]
- B. Huang, **K. Bradbury**, L. M. Collins, J. M. Malof (2020). Do Deep Learning Models Generalize to Overhead Imagery from Novel Geographic Locations? The xGD Benchmark Problem. *Presented at the 2020 IEEE International Geoscience and Remote Sensing Symposium*. [[paper](#)]
- W. Hu, B. Alexander, W. Cathcart, A. Hu, V. Nair, L. Zuo, J. M. Malof, L. M. Collins, **K. Bradbury** (2020). Mapping electric transmission line infrastructure from aerial imagery with deep learning. *Presented at the 2020 IEEE International Geoscience and Remote Sensing Symposium*. [[paper](#)]
- F. Kong, B. Huang, **K. Bradbury**, and J. M. Malof (2020). The Synthinel-1 dataset: a collection of high resolution synthetic overhead imagery for building segmentation. In *The IEEE Winter Conference on Applications of Computer Vision* (pp. 1814-1823). [[paper](#)][[code](#)]
- F. Kong, C. Chen, B. Huang, L. Collins, **K. Bradbury**, and J. M. Malof (2019). Training a single multi-class convolutional segmentation network using multiple datasets with heterogeneous labels: preliminary results. In *IGARSS 2019-2019 IEEE International Geoscience and Remote Sensing Symposium* (pp. 3903-3906). IEEE. [[paper](#)]
- K. Lin, B. Huang, L. Collins, **K. Bradbury**, and J. M. Malof (2019). A simple rotational equivariance loss for generic convolutional segmentation networks: preliminary results. In *IGARSS 2019-2019 IEEE International Geoscience and Remote Sensing Symposium* (pp. 3876-3879). IEEE. [[paper](#)]
- K. Bradbury**, J. Malof, M.A. Jeuland, B. Huang, B. Wong, T. Johnson, and L. Collins (2018). Open Energy Infrastructure Data Through Automated Assessment Using Satellite Imagery. *Presented at 2018 AGU Fall Meeting*. [[poster abstract](#)]
- B. Huang, L. M. Collins, **K. Bradbury**, and J. M. Malof (2018). Deep Convolutional Segmentation of Remote Sensing Imagery: A Simple and Efficient Alternative to Stitching Output Labels. In *IGARSS*

2018-2018 *IEEE International Geoscience and Remote Sensing Symposium*, 6899–6902. IEEE. [\[paper\]](#)

- B. Huang, K. Lu, N. Audebert, A. Khalel, Y. Tarabalka, J. M. Malof, A. Boulch, B. Le Saux, L. Collins, **K. Bradbury**, S. Lefèvre, and M. El-Saban (2018). Large-Scale Semantic Classification: Outcome of the First Year of Inria Aerial Image Labeling Benchmark. In *IGARSS 2018-2018 IEEE International Geoscience and Remote Sensing Symposium*, 6947–6950. IEEE. [\[paper\]](#)
- B. Huang, D. Reichman, L. M. Collins, **K. Bradbury**, and J. M. Malof (2018). On the Extraction of Training Imagery from Very Large Remote Sensing Datasets for Deep Convolutional Segmentation Networks. *IGARSS 2018 - 2018 IEEE International Geoscience and Remote Sensing Symposium*, Valencia, pp. 6895-6898. [\[paper\]](#)
- A. Streltsov, **K. Bradbury**, and J. M. Malof (2018). Automated Building Energy Consumption Estimation from Aerial Imagery. *IGARSS 2018 - 2018 IEEE International Geoscience and Remote Sensing Symposium*, Valencia, pp. 1676-1679. [\[paper\]](#)
- R. Wang, L. M. Collins, **K. Bradbury**, and J. M. Malof (2018). Semisupervised Adversarial Discriminative Domain Adaptation, with Application to Remote Sensing Data. In *IGARSS 2018-2018 IEEE International Geoscience and Remote Sensing Symposium*, 3611–3614. IEEE. [\[paper\]](#)
- B. Huang, M. Knox, **K. Bradbury**, L. Collins, and R. Newell (2017). Non-intrusive load monitoring system performance over a range of low frequency sampling rates. In *2017 IEEE 6th International Conference on Renewable Energy Research and Applications (ICRERA)*, San Diego, CA, pp. 505-509. [\[paper\]](#)
- R. Wang, J. Camilo, L. M. Collins, **K. Bradbury**, and J. M. Malof (2017). The poor generalization of deep convolutional networks to aerial imagery from new geographic locations: an empirical study with solar array detection. In *2017 IEEE Applied Imagery Pattern Recognition Workshop (AIPR)*, Washington, DC, pp. 1-8. [\[paper\]](#)
- J. M. Malof, S. Chelikani, L. M. Collins, and **K. Bradbury** (2017). Trading spatial resolution for improved accuracy in remote sensing imagery: an empirical study using synthetic data. In *2017 IEEE Applied Imagery Pattern Recognition Workshop (AIPR)*, Washington, DC, pp. 1-7. [\[paper\]](#)
- J. Camilo, L. M. Collins, **K. Bradbury**, and J. M. Malof (2017). Application of a semantic segmentation convolutional neural network for accurate automatic detection and mapping of solar photovoltaic arrays in aerial imagery. Presented at the *IEEE Applied Imagery Pattern Recognition Workshop* in Washington, D.C. [\[paper\]](#)
- S. Qian, S. Chelikani, P. Wang, L. Collins, **K. Bradbury**, and J. M. Malof (2017). Trading spatial resolution for improved accuracy when using detection algorithms on remote sensing imagery. In *2017 IEEE International Geoscience and Remote Sensing Symposium (IGARSS)*, Fort Worth, TX, pp. 3716-3719. [\[paper\]](#)
- J. M. Malof, L. Collins, and **K. Bradbury** (2017). A deep convolutional neural network, with pre-training, for solar photovoltaic array detection in aerial imagery. In *2017 IEEE International Geoscience and Remote Sensing Symposium (IGARSS)*, Fort Worth, TX, pp. 874-877. [\[paper\]](#)
- B. So, C. Nezin, V. Kaimal, S. Keene, L. Collins, **K. Bradbury**, and J. M. Malof (2017). Estimating the electricity generation capacity of solar photovoltaic arrays using only color aerial imagery. In *2017 IEEE International Geoscience and Remote Sensing Symposium (IGARSS)*, Fort Worth, TX, pp. 1603-1606. [\[paper\]](#)
- J. M. Malof, L. Collins, **K. Bradbury**, and R. Newell (2016). A Deep Convolutional Neural Network and a Random Forest Classifier for Solar Photovoltaic Array Detection in Aerial Imagery. In *2016 IEEE International Conference on Renewable Energy Research and Applications (ICRERA)*, pp. 650–54. [\[paper\]](#)
- J. M. Malof, **K. Bradbury**, L. Collins, R. Newell, A. Serrano, H. Wu, and S. Keene (2016). Image Features for Pixel-Wise Detection of Solar Photovoltaic Arrays in Aerial Imagery Using a Random Forest

Classifier. In *2016 IEEE International Conference on Renewable Energy Research and Applications (ICRERA)*, pp. 799–803. [[paper](#)]

J. M. Malof, R. Hou, L. Collins, **K. Bradbury**, and R. Newell (2015). Automatic solar photovoltaic panel detection in satellite imagery. In *2015 International Conference on Renewable Energy Research and Applications (ICRERA)*, pp. 1428–1431. [[paper](#)]

N. Czarnek, K. Morton, L. Collins, R. Newell, and **K. Bradbury** (2015). Performance Comparison Framework for Energy Disaggregation Systems. In *2015 IEEE International Conference on Smart Grid Communications (SmartGridComm)*, pp. 446–452. [[paper](#)]

**K. Bradbury**, P. Torriano, and L. Collins (2009). Real-time Gaussian Markov random-field-based ground tracking for ground penetrating radar data. *Proceedings of SPIE*, Orlando, FL, USA, Vol. 7303, pp. 730320-730320-10. [[paper](#)]

**Bradbury, K.** and J. Noonan (2008). Covert Binary Communications through the Application of Chaos Theory: Three Novel Approaches. *Journal of Systemics, Cybernetics and Informatics*, Vol. 6, No. 3, pp. 28-33. [[paper](#)]

## Under review

P. J. Markakis, T. M. Gowdy, J. M. Malof, Z. Sheng, B. Lancellotti, L. Collins, A. Davitt, and **K. Bradbury**. Estimating Global, High-resolution Onsite Building Emissions. *Under Review*. [[preprint](#)]

A. Sable, B. Linjawi, F. Luzi, **K. Bradbury**, J. M. Malof, and O. Delaire. Machine Learning Inversion of Interatomic Force Constants from Single-Crystal Inelastic Neutron Scattering. *Under Review*.

B.V. Lancellotti, J. M. Malof, A. Davitt, G. McCormick, S. Anderson, P. Carbó-Mestre, G. Collins, V. Crane, Z. Doctor, G. Ebri, K. Foster, T. M. Gowdy, M. Guzzardi, J. Heal, H. Hunter, D. Kroodsma, K. M. Galib, P. J. Markakis, G. McDonald, D. P. Moore, E. D. Nguyen, S. Parvu, M. Pekala, C. D. Piatko, A. Piscopo, M. Powell, K. Raniga, E. P. Reilly, M. Robinette, I. Saraswat, P. Sicurello, I. Soldner-Rembold, R. Song, C. Underwood, and **K. Bradbury**. Closing Gaps in Emissions Monitoring with Climate TRACE. *Under Review*. [[preprint](#)]

D. Allabadi, **K. Bradbury**, and J. M. Malof. Improving and Evaluating Open Deep Research Agents. *Under Review*. [[preprint](#)]

K. Khanal, N. Kaza, N. Kittner, **K. Bradbury**, H. Garcia. Characterizing Solar PV Exposure to Flood Risk in Central and Coastal North Carolina. *Under Review*. [[preprint](#)]

S. Lahrichi, Z. Sheng, S. Xia, **K. Bradbury**, J.M. Malof. Is Self-Supervised Pre-training on Satellite Imagery Better than ImageNet? A Systematic Study with Sentinel-2. *Under Review*. [[preprint](#)]

M. Hernandez, D. Floros, D. Patino-Echeverri, **K. Bradbury**. Learning to Solve the Unit Commitment Problem. *Under Review*.

## White papers

B. Huang, Y. Xu, **K. Bradbury**, J. Malof (2020). Synthinel-2: improved generation of high resolution synthetic overhead imagery for building segmentation.

**K. Bradbury**, M. Knox, L. Collins, and R. Newell (2016). Generating Synthetic Device-level Electricity Consumption Data.

M. Lin, **K. Bradbury**, and R. Newell (2016). Energy Saving Control Strategies for Conventional Domestic Water Heaters.

F. Xu, **K. Bradbury**, and D. Patino-Echeverri (2015). Techniques for Measuring the Green Economy.

**K. Bradbury** (2010). Energy Storage Technology Review.

**K. Bradbury** (2007). Hidden Markov Models: Theory, Implementation, and Extensions.

## Invited talks

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### External presentations

“The Energy System and Climate Mitigation.” **Climate Science and Law**. Bolch Judicial Institute and Climate Judiciary Project. Beaufort, NC. 20-21 October 2025.

- “AI and Building Energy Management.” **UNC CleanTech Summit**. Chapel Hill, NC. 24 March 2025.
- “AI-enabled Global Greenhouse Gas Emissions Inventories.” **Lenovo AI x Climate Symposium**. Lenovo Headquarters, Morrisville, NC. 13 September 2024.
- “Remote sensing for energy and climate applications.” **Intelligent Systems Center Seminar Series**. Johns Hopkins Applied Physics Lab, Laurel, MD. 1 August 2024.
- “Potential of AI for Energy Systems.” **World Bank EEX Forum**. World Bank Headquarters, Washington, DC. 30 April 2024.
- “AI and Remote Sensing for Monitoring Energy Systems.” Department of Civil, Construction, and Environmental Engineering **Computing and Systems Colloquium Series**. North Carolina State University. Raleigh, NC. 28 March 2024.
- Technology Advancements in System Planning. **Wisconsin Public Utilities Institute**. Virtual. 20 September 2023.
- “AI and Remote Sensing for Grid Monitoring and Planning.” Energize 2023: Paving The Way Towards Zero-touch Automation. **ANB Systems**. Virtual. 9 January 2023.
- “Remote sensing of energy systems: applications, challenges, and opportunities.” Energy Analysis and Policy 2022 Conference: Satellite Data for Energy Analysis and Policy. **University of Wisconsin**. 7 October 2022.
- “Remote sensing of energy systems Applications, challenges, and opportunities.” The Second ACM Special Interest Group on Energy Systems and Informatics Workshop on Society, Climate, and Sustainability (**SIGEnergy WeCan**). Virtual. 27 June 2022. [\[video\]](#)
- “Remote sensing of energy systems Applications, challenges, and opportunities.” **Johns Hopkins Applied Physics Laboratory Speaker Series**. Laurel, Maryland. 25 February 2022.
- “Energy data analytics for the electric power and natural gas distribution sectors: research innovation and opportunities.” **Dominion Energy**. Virtual. 1 September 2021.
- “Energy data analytics for the electric power sector: research innovation and opportunities.” **Great Coops Data Analytics Collaborative**. Virtual. 17 June 2021.
- “Automating energy system assessment with computer vision and overcoming data limitations through synthetic imagery.” Co-presented with Jordan Malof. **Johns Hopkins Applied Physics Lab Intelligent Systems Center Seminar Series**. 3 September 2020.
- “Deep learning techniques to inform energy access decisions.” **2020 IEEE Power and Energy Society General Meeting**. Virtual (Montreal, Canada). 2-6 August 2020.
- “Engaging Academia and Student Researchers.” Data Science Solutions to Environmental Challenges in the Electric Power Industry: An **EPRI-EPIC Workshop**. Washington, D.C. 7-8 November 2019.
- “Distributed energy resource and infrastructure assessment using overhead imagery.” Smart Grid Edge Analytics Workshop. **Georgia Tech Global Learning Center**. Atlanta, Georgia. 4-5 June 2019. [\[agenda\]](#)
- “Estimating energy access and use from satellite imagery using machine learning.” Panel discussion with C. Hitaj, S. Russo, D. Sullivan, and A. Stocking. *Energy Research Insights for Decisionmaking Conference*. **Resources for the Future**. Washington, D.C., 29-30 December 2018. [\[agenda\]](#)[\[video\]](#)
- “Energy Data Analytics.” Moderator for panel discussion. Western Energy and Water Forum. **Colorado Energy and Water Institute**. Steamboat Springs, CO. 23-26 January 2019.
- “Estimating energy access and use from satellite imagery using machine learning” Human Geography Dimensions of Energy Access and Use. World-Wide Human Geography Data (WWHGD) Working Group. **Georgetown University**. 27 June 2018. [\[video\]](#)
- “Estimating electricity access from remote sensing data.” **Sustainable Energy Transitions Initiative (SETI) Third Annual Meeting**. Duke University. Durham, NC, 15-17 May 2018.

“Automated energy infrastructure assessment using satellite imagery.” **University of Massachusetts, Amherst**. Amherst, Massachusetts, 4 May 2018.

Workshop on: “Promoting Digital Innovations to Enable Clean Energy Systems.” **Council on Foreign Relations**. New York, New York, 22-23 February 2018.

“Public Sector Building Energy Efficiency: Maybe There is a Silver Bullet.” Panel Presentation with H. Bergmann and D. Seligman. **U.S. Department of Energy Better Buildings Summit**. Washington, D.C., 17 May 2017.

“From Pixels to Knowledge: Using Machine Learning to Extract Insights from Energy Data.” **Analytics Experience 2016. SAS**. Las Vegas, NV. 14 September 2016.

“Energy Storage and the Grid: Prospects and Policy.” Panel Presentation with M. Dorsey, S. Ackerman, V. Koritarov, and C. Hunt. **American Chemical Society Science & the Congress Project**. Washington, D.C. 28 June 2016. [[video](#)]

“New Research in Predictive Analytics for Utilities.” Panel presentation with Arcot Rajasekar, Tim Driscoll, Ozge Kaplan, and Rudy Shankar. **North Carolina Clean Tech Summit**. Chapel Hill, NC. 19 February 2016.

“Big Data & Analytics.” Panel presentation with Marco Loeffke and Jack Connell. 2015 **State Energy Conference**. Raleigh, NC. 21-22 April 2015.

“Using Data to Change Behavior.” **Data4Decisions Conference**. Panel presentation with Vikram Rao and Timur Hicyilmaz. Raleigh, NC. 25 March 2015.

“Design and Implementation of an Energy Data Analysis System.” Energy and Environment Lunch and Learn, **RTI International**, 21 August 2014.

#### Convenings hosted

**Energy Data Analytics Symposium: Sustainability in the AI Era**. Duke University. 26-27 October 2023. This event featured 16 speakers from across the U.S. and 180 registered participants. [[agenda](#)] [[videos](#)]

**Energy Data Analytics Symposium**. Duke University. Virtual. 8-9 December 2020. The event engaged 200+ attendees from approximately 100 organizations, spanning 19 states and 19 countries. [[videos](#)]

#### Other workshops & internal presentations

National Science Foundation / Power Systems Engineering Research Center (PSERC) Grid at the Edge Workshop. 23-24 March 2021.

“Automatically estimating solar photovoltaic capacity and building energy consumption using satellite imagery.” Energy Data Analytics Symposium. Duke University. Virtual. 8-9 December 2020.

“Energy Breakfast Series: Big Data and Machine Learning.” Duke Alumni Association. Research Triangle Park. 27 February 2020.

“Non-intrusive Load Monitoring.” Data Analytics for Energy Workshop. Duke Kunshan University. Kunshan, China, 11 October 2017.

“Energy + Data: The short version of the long history of energy data.” Durham Engineer’s Club Scholar Dinner Speaker. Durham, NC. 18 May 2017.

“From Pixels to Knowledge: Extracting Insights from Energy Data through Visualization.” Duke Visualization Friday Forum. Duke University. 15 April 2016.

“Overview of the Energy Data Analytics Lab.” Energy Research Collaboration Workshop. Duke University, Durham, NC. 5 May 2015.

“Electric Power Systems.” Energy Industry Fundamentals Conference, Fuqua School of Business, Duke University, 28 August 2014.

“Design and Implementation of an Energy Data Analysis System.” Duke University Energy Research Collaboration Workshop, Duke University, 6 May 2014.

“Electric Power Markets.” Energy Industry Fundamentals Conference, Fuqua School of Business, Duke University, 30 August 2013.

“The University as an Energy Laboratory: Design and Implementation of an Energy Disaggregation System.” Duke University Energy Researcher Workshop, Duke University, 30 August 2013.

## Datasets

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Climate TRACE Coalition (Duke University is a member, **K. Bradbury** leads the buildings sector). Climate TRACE dataset (2024-present). [[dataset and website](#)]

C. Robinson, **K. Bradbury**, and M. Borsuk (2023). Remotely sensed above-ground storage tank dataset for object detection and infrastructure assessment. *Figshare*. [[dataset](#)]

W. Hu, T. Feldman, J. M. Malof, A. Ye, E. Lin, J. Ou, J. L. Moscoso, N. Tarn, W. Zhang, and **K. Bradbury** (2021). Synthetic Wind Turbine Dataset. *Figshare*. [[dataset](#)]

W. Hu, B. Huang, **K. Bradbury**, J. M. Malof, V. Nair, T. Pathirathna, X. You, Q. Han, J. Yang, A. Streltsov, and L. M. Collins (2021). Electric Transmission Infrastructure Satellite Imagery Dataset for Computer Vision. *Figshare*. [[dataset](#)]

F. Kong, B. Huang, **K. Bradbury**, and J. M. Malof (2020). The Synthinel-1 dataset: a collection of high resolution synthetic overhead imagery for building segmentation. [[dataset](#)]

**K. Bradbury**, Q. Han, V. Nair, T. Pathirathna, and X. You (2018). Electric Transmission and Distribution Infrastructure Imagery Dataset. *Figshare*. [[dataset](#)]

**K. Bradbury**, B. Li, B. Brigman, G. Chandrasekar, S. Hossain, T. Nagenalli, L. M. Collins, T. Johnson, and M. Jeuland (2017). Indian Village Satellite Imagery and Energy Access Dataset. *Figshare*. [[dataset](#)]

**K. Bradbury**, B. Brigman, G. Chandrasekar, L. M. Collins, S. Hossain, M. Jeuland, T. Johnson, B. Li, and T. Nagenalli (2017). Power Plant Satellite Imagery Dataset. *Figshare*. [[dataset](#)]

**K. Bradbury**, B. Brigman, L. M. Collins, T. Johnson, S. Lin, R. Newell, S. Park, S. Suresh, H. Wiesner, and Y. Xi (2016). Aerial imagery object identification dataset for building and road detection, and building height estimation. *Figshare*. [[dataset](#)]

**K. Bradbury**, R. Saboo, T. Johnson, J. M. Malof, A. Devarajan, W. Zhang, L. Collins, and R. Newell. Distributed Solar Photovoltaic Array Location and Extent Data Set for Remote Sensing Object Identification (2016). *Figshare*. [[dataset](#)]

## Grants

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### External grants

**K. Bradbury (PI)**. Climate TRACE Phase 7 - Building Emissions Measurement. **WattTime**. 2025.

**K. Bradbury (PI)**. Climate TRACE Phase 6 - Building Emissions Measurement. **WattTime**. 2024.

**K. Bradbury (PI)**. Estimating regional non-electricity building energy consumption. **WattTime**. 2023.

**K. Bradbury (PI)**. Estimating regional non-electricity building energy consumption. **WattTime**. 2022.

**K. Bradbury (PI)**. Energy and Climate Data Commons (gift). **Google**. 2021.

B. Murray (PI), W. Pizer (Co-PI), L. Collins (Co-PI), and **K. Bradbury (Co-PI)**. Interdisciplinary Energy Data Analytics Ph.D. Fellows Program Phase II: Training the Next generation of Energy Data Scholars. **Alfred P. Sloan Foundation**. 2020.

**K. Bradbury (Co-PI)** and J. M. Malof (Co-PI). Solar Photovoltaic (PV) and Real Estate For Project PV Auto-Pop Task: Phase II. **Lawrence Berkeley National Laboratory**. Sponsored Research (Project Extension). Subcontract No. 7463277 (Modification). 25 September 2019.

**K. Bradbury (PI)**, J. Malof (Co-PI), B. Murray (Co-PI), D. Harrison-Atlas (Co-PI, NREL), J. Friedrich (Co-PI, WRI), and S. Rose (Co-PI, EPRI). Convergence Accelerator Phase I (RAISE): Open Knowledge

Network for the Global Energy Data Commons. **National Science Foundation**. 1 September 2019 – 31 May 2021. Award No. 1937137.

**K. Bradbury (Co-PI)** and J. M. Malof (Co-PI). Solar Photovoltaic (PV) and Real Estate For Project PV Auto-Pop Task. **Lawrence Berkeley National Laboratory**. Sponsored Research. Subcontract No. 7463277. 22 February 2019.

J. Schaich Borg, J (PI), **K. Bradbury (Co-PI)**, T. Nechyba (Co-PI), and A. Calderbank (Co-PI). IGE: Leveraging Data Science Master Programs to Enhance Professional Readiness in STEM PhD Students. **National Science Foundation**. 1 September 2018 – 31 August 2021.

J. M. Malof (PI), **K. Bradbury (Co-PI)**. Global Energy Infrastructure and Access Assessment Using Overhead Imagery. **National Science Foundation XSEDE Allocation**. January-December 2019.

**K. Bradbury (Co-PI)** and J. M. Malof (Co-PI). Estimating solar PV locations and capacity in Adelaide, Australia. **Australia Electric Market Operator**. Sponsored Research. October-December 2018.

B. Murray (Co-PI), **K. Bradbury (Co-PI)**, W. Pizer (Co-PI), and C. Rudin (Co-PI). Interdisciplinary Energy Data Analytics Ph.D. Fellows Program. **Alfred P. Sloan Foundation**. 2017.

**K. Bradbury (PI)**. Hardware: Titan X GPU. NVIDIA Hardware Grant. **NVIDIA Corporation**. 2016.

R. Newell (PI), M. Harding, and **K. Bradbury**. Energy Data Analytics Lab. **Alfred P. Sloan Foundation**. 2015-2017.

R. Newell (PI) and **K. Bradbury**. **Sunnovations, Inc.** Sponsored Research Agreement. 2015-2016.

R. Newell (Co-PI), W. Pizer (Co-PI), and **K. Bradbury (Co-PI)**. Advanced Analytics for Smart Meter Building Data. **Wells Fargo Foundation**. 2015-2016.

L. Huettel (Co-PI) and **K. Bradbury (Co-PI)**. Lord Foundation of North Carolina. Energy Disaggregation and Signal Processing: Connecting Fundamental Concepts to Real Problems. 2014.

**K. Bradbury**. **National Science Foundation Graduate Research Fellowship**. 2008-2012.

## Internal grants

**K. Bradbury (PI, Co-PI)**. Bass Connections project teams grants: 2023-2024, 2022-2023, 2021-2022, 2020-2021, 2019-2020, 2018-2019, 2017-2018, 2016-2017, 2015-2016, 2014-2015, 2013-2014.

R. Fetter. (Co-PI), J. Malof (Co-PI), **K. Bradbury (Co-PI)**, J. Rineer, R. Beach. Mapping Solar Photovoltaic Arrays Using Unpiloted Aerial Vehicles. Duke University **Nicholas School of the Environment Catalyst Program**. 2020. (Partnership with RTI International)

M. Bergin (PI), D. Shindell (Co-PI), **K. Bradbury (Co-PI)**, D. Carlson (Co-PI), B. Murray (Co-PI), M. Wiesner (Co-PI), D. Mitzi (Co-PI), S. Sexton (Co-PI), G. Katul (Co-PI), and W. Walker. Minimizing the influence of Air Pollution on Solar Energy Production Globally: Framework Development to Save Billions of USD Annually. **Provost's Collaboratories: Energy and Water Resources initiative**. 1 July 2019 – 30 April 2020.

M. Bergin (PI), D. Shindell (Co-PI), **K. Bradbury**, D. Carlson, B. Murray, and M. Wiesner. Minimizing the influence of Air Pollution on Solar Energy Production Globally: Framework Development to Save Billions of USD. **Duke University Energy Initiative Research Seed Fund**. April 2019.

J. M. Malof (PI), **K. Bradbury (Co-PI)**, M. Jeuland (Co-PI), S. Sexton (Co-PI), and B. Bollinger (Co-PI). Mapping global energy infrastructure to support effective policymaking, investment, and grid management. **Provost Pilot Research Grants**. 2018.

M. Jeuland (Co-PI), M. Borsuk (Co-PI), L. M. Collins (Co-PI), **K. Bradbury (Co-PI)**, J. M. Malof (Co-PI), and L. Olander (Co-PI). Does rural energy access promote economic development through improved food and water access? **Nicholas Institute Catalyst Program**. 2017.

R. Calderbank (Co-PI), B. Murray (Co-PI), L. Benneer (Co-PI), and **K. Bradbury (Co-PI)**. The Generator: transforming Gross Hall 100C into a flexible, accessible space for interdisciplinary learning and team-based problem solving. **Undergraduate Program Enhancement Fund (UPEF)**. 2017.

**K. Bradbury (Co-PI)**, and L. M. Collins (Co-PI). Introductory Machine Learning for Data Science. **Bass Connections Course Development Grant**. 2017.

## Awards

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Master of Interdisciplinary Data Science Distinguished Faculty Award for Outstanding Teaching and Mentorship, 2024

Bass Connections Leadership Award, 2022 [[award news item](#)]

Master of Interdisciplinary Data Science Distinguished Faculty Award for Outstanding Teaching and Mentorship, 2021

DigitalGlobe GBDX for Sustainability Challenge (one of five selected teams). “Using high-resolution satellite imagery and computer vision to build an open database of global power plants.” With Jordan Malof, Colin McCormick, and Johannes Friedrich. Access was awarded to DigitalGlobe’s entire archive of satellite imagery data. 2018

Nomination: Outstanding Postdoc at Duke University, 2013

Estwing Award: Teaching Assistant of the Year, 2011

National Science Foundation, Graduate Research Fellowship, 2008

Tufts University: Class of 1947 Victor Prather Prize, 2007

Tufts University: The Harry Poole Burden Prize in Electrical Engineering, 2007

Astronaut Scholarship Foundation Award, 2006

Tau Beta Pi Scholarship, 2006

Eta Kappu Nu, Electrical and Computer Engineering Honor Society, 2006

Tau Beta Pi, Engineering Honor Society, 2005

## Teaching

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### Courses taught

Instructor: IDS 705: **Principles of Machine Learning**, Duke University. A core course for the Masters of Interdisciplinary Data Science (MIDS) program. Year taught include:

Spring 2026 [[website](#)]

Spring 2025 [[website](#)]

Spring 2024 [[website](#)]

Spring 2023 [[website](#)]

Spring 2022 [[website](#)]

Spring 2021 [[website](#)]

Spring 2020 [[website](#)]

Spring 2019 [[website](#)]

Instructor: Bass Connections Project Team. Tracking Climate Change with Satellites and Artificial Intelligence. ENERGY 395/396 and 795/796, Duke University, F2023-S2024 [[website](#)]. Featured in the 2024 Fortin Foundation Bass Connections Showcase [[video](#)]

Instructor: Bass Connections Project Team. Tracking Climate Change with Satellites and Artificial Intelligence. ENERGY 395/396 and 795/796, Duke University, F2022-S2023 [[website](#)]

Instructor: Bass Connections Project Team. Creating Artificial Worlds with AI to Improve Energy Access Data. ENERGY 395/396 and 795/796, Duke University, F2021-S2022 [[website](#)] [[final student report website](#)] [[leadership award](#)]

Instructor: Bass Connections Project Team. Deep learning for rare energy infrastructure in satellite imagery. ENERGY 395/396 and 795/796, Duke University, F2020-S2021 [[website](#)] [[final student report website](#)] [[video](#)]

Instructor: Bass Connections Project Team. Energy Data Analytics Lab: A wider lens on energy: adapting deep learning techniques to inform energy access decisions. ENERGY 395/396 and 795/796, Energy Data Analytics Lab, Duke University, F2019-S2020 [[website](#)] [[final student report website](#)] [[video](#)]

Instructor: Bass Connections Project Team. Energy Data Analytics Lab: Energy Infrastructure Map of the World through Satellite Data. ENERGY 395/396 and 795/796, Energy Data Analytics Lab, Duke University, F2018-S2019 [[website](#)]

Instructor: ECE/ENERGY 590: Introduction to Machine Learning for Data Science, Duke University S2018 [[website](#)]

Instructor: Bass Connections Project Team. Energy Data Analytics Lab: Electricity Access in Developing Countries from Aerial Imagery. ENERGY 395/396 and 795/796, Energy Data Analytics Lab, Duke University, F2017-S2018 [[website](#)]

Instructor: Bass Connections Project Team. Energy Data Analytics Lab: Estimating Building Energy Consumption from Aerial Imagery. ENERGY 395/396 and 795/796, Energy Data Analytics Lab, Duke University, F2016-S2017 [[website](#)]

Instructor: Bass Connections Project Team. Energy Data Analytics Lab: Estimating Solar PV from Aerial Imagery. ENERGY 395/396 and 795/796, Duke University, F2015-S2016 [[website](#)]

Instructor: Bass Connections Project Team. The University as a Laboratory for Smart Grid Data Analytics. ENERGY 395/396 and 795/796, Duke University, F2014-S2015 [[website](#)]

Instructor: Bass Connections Project Team. Design and Implementation of an Energy Disaggregation System. ENERGY 395/396 and 795/796, Duke University, F2013-S2014 [[website](#)]

## Online courses developed

**K. Bradbury\***, N. Eubank\*, A. Hilton\*, G. Lipp\*. (\* denotes equal instructor contributions)  
[Coursera specialization: Programming for Python Data Science: Principles to Practice.](#)

The five-course specialization includes the following components:

1. Course 1: [Python Programming Fundamentals](#)
2. Course 2: [Data Science with NumPy, Sets, and Dictionaries](#)
3. Course 3: [Pandas for Data Science](#)
4. Course 4: [Designing Larger Python Programs for Data Science](#)
5. Course 5: [Data Visualization and Modeling in Python](#)

## Program leadership

Climate+ Summer Program Lead (2022-present)

Energy Data Analytics Ph.D. Fellowship Program Co-lead with B. Murray, W. Pizer, and L. Collins (2018-2023)

## Mentoring

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### Ph.D. dissertation committees

- Sarah Scott (CEE, 2025)
- Xiaodong Zhang (Nicholas 2025)
- Francesco Luzi (ECE, 2025)
- Kaleb Kassaw (ECE, 2025)
- Kshitiz Khanal (UNC, City & Regional Planning, 2024)
- Mauricio Hernandez (Nicholas, 2024)
- Matthew Inkawich (ECE, 2024)
- Xiaodong Zhang (Nicholas, 2024)
- Simiao (Ben) Ren (ECE, 2023)
- Handi Yu (ECE, 2022)
- Evan Stump (ECE, 2022)
- Bohao Huang (ECE, 2020)

- Nicholas Czarnek (ECE, 2017)
- Daniël Reichman (ECE, 2017)

**Ph.D. preliminary exam committees**

*\* indicates chair or cochair*

- Zachary Calhoun (CEE, 2025) (Research Proposal Defense)
- Paul Markakis (ECE, 2024)\*
- Xiaodong Zhang (Nicholas, 2024)
- Sarah Scott (CEE, 2024)
- Zachary Calhoun (CEE, 2023)
- Xiaodong Zhang (Nicholas, 2023)
- Kaleb Kassaw (ECE, 2023)
- Khanal, Kshitiz (UNC City and Regional Planning, 2023)
- Simiao (Ben) Ren (ECE, 2022)
- Mauricio Hernandez (Nicholas, 2022)
- Sarah Scott (CEE, 2022)
- Matthew Inkawhich (ECE, 2021)
- Bohao Huang (ECE, 2019)
- Evan Stump (ECE, 2019)

**Ph.D. qualifying exam committees**

- Francesco Luzi (ECE, 2021)
- Kaleb Kassaw (ECE, 2021)
- Matthew Inkawhich (ECE, 2019)
- Nathan Inkawhich (ECE, 2019)
- Bohao Huang (ECE, 2018)

**Master's committee or project advisor**

- Nathan Bush, Nruta Choudhari, Nakiyah Dhariwala, Yixiao Wang (2025-2026)  
MIDS Capstone: The Conservation Fund
- Meixiang Du, Jiechen Li, Barbara Flores Rios, Yulei Xia (2024-2025)  
MIDS Capstone: Climate TRACE
- McCullough (Mac) Gray (ECE, 2024)  
Masters Project Exam: Predicting Student Performance Using Discussion Forums' Participation Data.
- Pooja Kabber, Sukpreet Sahota, Dingkun Yang, Yuanjing Zhu (2023-2024)  
MIDS Capstone: Understanding the scope, drivers, and energy justice implications of solar adoption in the United States wastewater sector using applied computer vision and satellite imagery
- Yuting Chiu, Marlyne Hakizimana, Emilia Mavis (2022-2023)  
MIDS Capstone. ClimateEye: multimodal self-supervised satellite imagery analysis for climate applications
- Nikhil Bhargava, Dean Huang, Xiaohan Yang, Yijia Zhang (2021-2022)  
MIDS Capstone: Sizing the Stack: power plant and industrial flue-gas stack height estimation from satellite imagery for tracking greenhouse gases and pollutants
- Xiankang (Jeremy) Zeng (2022)  
MIDS Capstone: Data Commons
- Zhenxing (Charlie) Xie (2021-2022)  
MIDS Capstone: Geospatial foundation models for domain adaptation
- Qianyu Zhao (CEE, 2021)  
Masters Project Exam

**Data+ / Climate+  
summer program  
primary advisor**

- Abdullah AlOthman, Jose Moscoso, Sebastián Soriano Perez (2020-2021)  
MIDS Capstone: Unlocking Earth Observation Datasets with GEODOME (Geographically diverse, Earth Observation Dataset with Multiple sEnsenor modalities)
- Tracking climate change causes & impacts with satellites and AI. 2023.  
[[project](#)] [[poster](#)] [[video](#)]  
Undergraduate: Michelle Heo, Divyansh Jain, Xuanang Zhou  
Graduate Project Manager: Paul Markakis
- Tracking climate change causes & impacts with satellites and AI. 2022.  
[[project](#)] [[poster](#)] [[video project summary](#)] [[video interview](#)]  
Undergraduate: Saad Lahrichi, Rebecca Lan, Edrian Liao  
Graduate Project Manager: Zachary Calhoun
- Creating artificial worlds with AI to improve energy access data. 2021.  
[[project](#)] [[poster](#)] [[video presentation](#)]  
Undergraduate: Alex Kumar, Caroline Tang, Frankie Willard  
Project Manager: Wei Hu
- Deep learning for rare energy infrastructure in satellite imagery. 2020. [[project](#)]  
Undergraduate: Tyler Feldman, Matt Robbins  
Graduate Project Manager: Bohao Huang
- A wider lens on energy: adapting deep learning techniques to inform energy access decisions. 2019. [[project](#)] [[executive summary](#)]  
Undergraduate: Varun Nair, Paul Rhee, Jichen Yang  
Graduate Project Manager: Fanjie Kong
- Energy Infrastructure Map of the World. 2018. [[project](#)] [[executive summary](#)]  
Undergraduate: Varun Nair, Tamasha Pathiranthra, Xiaolan You  
Graduate Project Manager: Qiwei Han
- Electricity Access in Developing Countries from Aerial Imagery. 2017.  
[[project](#)] [[video](#)] [[summary](#)]  
Undergraduate: Ben Brigman, Gouttham Chandrasekar, Shamkikh Hossain, Trishul Nagenalli  
Graduate Project Manager: Boning Li
- Energy Resource Assessment. 2016. [[project](#)] [[summary](#)]  
Undergraduate: Ben Brigman, Joyce Xi  
Graduate Project Managers: Sunith Suresh, Hoël Wiesner
- Solar Power Estimation. 2015. [[project](#)] [[video](#)] [[summary](#)]  
Undergraduate: Sharrin Manor, Wuming Zhang, Jeffrey Perkins, Arjun Devarajan  
Graduate Project Managers: Raghav Saboo, Jordan Malof

**Other mentorship**

Bass Connections **Team Leader** (see Teaching section for full list of 11 teams led/co-led)

Bass Connections / Data+ / Climate+ **Team Contributor**\*:

\*Team Contributors participate as needed and provide guidance for the project

- Bass Connections Team. Energy Transition During Energy Crisis: Cape Town's Experience (F2025-S2026) [[project website](#)]
- Climate+/Data+ Team. Energy Transition During Energy Crisis. Summer 2025. [[project website](#)]
- Bass Connections Project team. Energy Transition During Energy Crisis: Cape Town's Experience, Duke University. F2024-S2025 [[project website](#)].
- Climate+/Data+ Team. Energy Transition During Energy Crisis: Cape Town's Experience, Duke University. Summer 2024 [[project website](#)].

Independent Study Advisor:

- Maanvi Chawla (ECE, Fall 2025)
- Julia Kourelakos (CS, Fall 2023, Spring 2024)
- Saad Lahrichi (Fall 2022, Spring 2023)
- Paul Rhee (ECE, Fall 2019)

Undergraduate Thesis Advisor: Sophia Park (ECE Pratt Fellow, Spring 2016)

## Service

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### Institutional service

Member, AI at Duke Steering Committee: Sustainability in AI Subcommittee, 2025

Member, Climate Commitment Advisory Council: Research Subcommittee, 2024-present

Chair, Library Council. 2023-present

Member, Library Council. 2021-2023

Search Committee Member: Data Visualization Analyst (Joint MIDS / Libraries hire), 2023

Interdisciplinary Data Science Master's admissions. 2018-present

Smart Home Faculty Advisor. Spring 2014-present

Cochair of the Climate & Data Science Working Group for the Board of Trustees Task Force on Climate Change and Sustainability. 2020-2021

Interdisciplinary Data Science Master's curriculum development. 2017-2018

Carbon Offsets Subcommittee. 2016 - 2017

The Foundry Governing Committee. 2015 - 2018

### Professional service

Member, Program Committee for Climate Change AI's workshop on "Tackling Climate Change with Machine Learning" at the Conference on Neural Information Processing Systems (NeurIPS) (2024)

Member, Program Committee for Climate Change AI's workshop on "Tackling Climate Change with Machine Learning" at the International Conference on Learning Representations (ICLR) (2024)

Member, Program Committee for Climate Change AI's workshop on "Tackling Climate Change with Machine Learning" at the Conference on Neural Information Processing Systems (NeurIPS) (2023)

Member, Technical Program Committee. NILM2020: 5rd International Workshop on Non-Intrusive Load Monitoring. 2020.

Member. Capacity Building for the Utilization of EOs among Utility Providers. Convened by Battelle, NASA, and the Group on Earth Observations. 2019-2021. [\[link\]](#)

Member, Technical Program Committee and Session Chair. NILM2016: 3rd International Workshop on Non-Intrusive Load Monitoring. 2016.

Member, Technical Review Committee. Department of Energy's (DOE's) Energy Policy and Systems Analysis (EPSA) project with Oak Ridge National Laboratory (ORNL) on Solar Photovoltaic Detection. 2016.

Member, Technical Review Committee. 2015 IEEE International Conference on Smart Grid Communications (SmartGridComm), Miami, FL. 2015.

### Referee activity

Funder review activity denoted by \*\*, book proposal/publisher reviews denoted by ^^

- ACM Journal on Computing and Sustainable Societies
- Alfred P. Sloan Foundation\*\*
- Applied Energy
- Cambridge University Press^^
- Climate Change AI

- Energies
- Energy & Buildings
- Energy Policy
- Environmental Science & Technology
- Harvard Data Science Review
- IEEE Transactions on Geoscience and Remote Sensing
- IET Generation, Transmission & Distribution
- ICLR Workshop on Climate Change
- International Conference on Learning Representations Workshop on Tackling Climate Change with Machine Learning
- International Multi-Conference on Complexity, Informatics and Cybernetics
- International Workshop on Non-Intrusive Load Monitoring
- ISPRS Journal of Photogrammetry and Remote Sensing
- McGraw Hill^^
- National Science Foundation\*\*
- Nature Communications
- NeurIPS Workshop on Tackling Climate Change with Machine Learning
- Remote Sensing Applications – Society & Environment
- RTI International
- Sustainable Cities and Society

## Media

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### External

- Blog Post. Duke's Kyle Bradbury, PhD, on the need for building emissions data. Climate TRACE Blog. October 29, 2024. [\[blog post\]](#)
- News. Justin R. Wolf. "World's Largest Inventory of Global GHG Emissions." Green Building Advisor. [\[story\]](#)
- Magazine Article. Dustin Zubke. Machine learning: "New electricity" enabling access. PV Magazine. 13 July 2020. [\[story\]](#)
- Blog Post. Jack Clark. Import AI 181: Welcome to the era of Chiplomacy! How computer vision AI techniques can improve robotics research, plus Baidu's adversarial AI software. 20 January 2020. [\[blog post\]](#)
- Blog Post. Paul Strobel. Tackling climate change with machine learning [part 1] – Electricity systems. 20 September 2019. [\[blog post\]](#)
- News. A.I. in the News. Fortune. 18 March 2019. [\[story\]](#)
- Blog Post. The Digital Revolution Is Transforming Energy—Whether It Slows Climate Change Is Up to Policymakers. The Council on Foreign Relations. 26 June 2018. [\[blog post\]](#)
- Blog Post. DigitalGlobe. GBDX for Sustainability Challenge: Making solar count—automatically identifying renewable energy infrastructure. 4 May 2018. [\[blog post\]](#)
- Blog Post. Amazon Web Services (AWS). Q&A with GBDX for Sustainability Challenge Finalists. 14 May 2018. [\[blog post\]](#)
- Newsletter. Astronaut Scholarship Foundation. Scholar Spotlight: Kyle Bradbury. 6 March 2018. [\[newsletter\]](#)
- Podcast. Storage Potential, the Role of EVs, and Data Analytics. The Energy Transitions Show with Chris Nelder. 1 February 2018. [\[podcast\]](#)
- Ask Me Anything. American Chemical Society Reddit 'Ask Me Anything' on Energy Storage and Energy Data Analytics. 11 October 2016. [\[ask me anything\]](#)
- News. TechXplore. Engineers seek energy insights by reading a building's electrical signatures. 5 October 2016. [\[news story\]](#)

Podcast. Home Energy Use. Interview with Brian Southwell and Mike Gallaher. *The Measure of Everyday Life*. WNCU 90.7 FM. 25 January 2015. [[podcast](#)]

## Internal

Duke Experts Provide Clearest Picture Yet of Global Building Emissions. February 9, 2025. Nicholas Institute. [[story](#)]

Climate+. Duke Climate Commitment Annual Report 2025. [[report](#)]

Climate TRACE. Duke Climate Commitment Annual Report 2025. [[report](#)]

In 'Plus' programs, Students Dive Into Pressing Issues. August 11, 2025. Duke Today. [[story](#)]

Students Accelerate Data-Driven Climate Research through Climate+. September 26, 2024. Nicholas Institute. [[story](#)]

Data+, the Exemplar of Experiential Education at Duke. Pratt. November 20, 2024. [[story](#)]

Nicholas Institute: Seven N.C. Students Named to Fifth Cohort of Energy Data Analytics Ph.D. Student Fellows. May 2023. [[story](#)]

Duke Today: Students Help Power Up New Ways to Analyze Energy Data. April 2023. [[story](#)]

Podcast: Satellite Imagery and Machine Learning: A Smarter Future for Energy Infrastructure Planning with Marc Jeuland and Dean Judith Kelley of the Sanford School. [[podcast](#)]

Nicholas Institute: Energy Data Analytics Ph.D. Student Fellows Program announces 2021 cohort with students from Duke University, NC State University, and UNC Charlotte. [[story](#)]

Bass Connections. Two Faculty Recognized for Exceptional Co-Leadership of Bass Connections Teams. April 2022. [[story](#)]

Energy Initiative. Energy Data Analytics Ph.D. Student Fellows Program announces 2021 cohort with students from Duke University, NC State University, and UNC Charlotte. April 2021. [[story](#)]

Energy Initiative. Watch: A Wider Lens on Energy – Adapting Deep learning Techniques to Inform Energy Access Decisions. [[story](#)]

Interdisciplinary Studies. Kyle Bradbury on Improving Global Energy Access through Machine Learning and Collaboration. [[story](#)]

Bass Connections. Faculty Perspectives: Kyle Bradbury. [[story](#)]

Energy Initiative. Western Energy & Water Forum (Jan. 23-26) to highlight Duke University expertise. Energy Initiative. 12 November 2018. [[story](#)]

Energy Initiative. New Duke program equips scholars to lead in emerging field of energy data analytics. Energy Initiative. 12 February 2019. [[story](#)]

Nicholas Institute. Harnessing the Power of Data: Sustainable Energy Transition Initiative Conference: Proceedings. Nicholas Institute. June 2018. [[story](#)]

Energy Initiative. Duke undergraduates create energy datasets and tools with wide-ranging impact. Energy Initiative. 28 September 2018. [[story](#)]

Energy Initiative. Duke expert touts transformative potential of energy data analytics in new book on digital decarbonization. Energy Initiative. 26 June 2018. [[story](#)]

Bass Connections. Three Graduate Students Honored for Outstanding Bass Connections Project Team Mentorship. 12 April 2018. [[story](#)]

Interdisciplinary Studies. New Grants Will Advance Collaborative Research by 11 Groups of Duke Faculty. 3 April 2018. [[story](#)]

Bass Connections. Student-produced Performance Illuminates Links between Energy, Technology and the Body. 19 March 2018. [[story](#)] [[video](#)]

Energy Initiative. Duke University and World Resources Institute research team is among five finalists in the GBDX Sustainability Challenge. 14 February 2018. [\[story\]](#)

Energy Initiative. Energy Data Analytics Lab team takes top prize at 2018 Duke Research Computing Symposium with electricity access project. 25 January 2018. [\[story\]](#)

Energy Initiative. Energy Initiative opens new innovation space in Gross Hall. 13 December 2017. [\[story\]](#)

Energy Initiative. Energy Initiative and Duke Libraries to host CLIR Postdoctoral Fellow in Data Curation for Energy Economics. 2 December 2017. [\[story\]](#)

Duke Research Blog. Mapping Electricity Access for a Sixth of the World's People. 1 August 2017. [\[story\]](#)

Bass Connections. Bass Connections Awards Grants for Three Interdisciplinary Courses. 4 May 2017. [\[story\]](#)

Pratt School of Engineering. Real Problems, Real Teamwork. 7 March 2017.

Pratt School of Engineering. Distinguishing Solar Panels from Swimming Pools. 29 August 2016.

Energy Data Analytics Symposium Opening Remarks: Kyle Bradbury. Energy Data Analytics Symposium 2023. [\[video\]](#)

Remote sensing of energy systems: applications, challenges, and opportunities. Energy Analysis and Policy (EAP) Conference, UW Madison 2022. [\[video\]](#)

Remote sensing of energy systems: applications, challenges, and opportunities. ACM SIGEnergy WeCan 2022. [\[video\]](#)

Estimating Solar PV Capacity & Building Energy Use with Satellite Imagery | Dr. Kyle Bradbury. Energy Data Analytics Symposium 2020. [\[video\]](#)

Computer vision for energy data analytics. Foundations for Energy Data Analytics Series at Duke University. [\[video\]](#)

MIDS Faculty Spotlight: Kyle Bradbury. [\[video\]](#)

RiiD Researcher Spotlight: Kyle Bradbury. [\[video\]](#)

Kyle Bradbury: Developing Insights Using New Data Tools. Resources for the Future Interview. [\[video\]](#)

Energy and data science resource (Energy Resources). [\[video\]](#)

Energy and data science resources (Data Science Resources). [\[video\]](#)

Git Part 1: What it is and how it works. [\[video\]](#)

Git Part 2: Step-by-step tutorial. [\[video\]](#)

Introduction to Jupyter Notebooks. [\[video\]](#)

Introduction to the Spyder IDE for Python. (over 100,000 views) [\[video\]](#)

Performance from "Visualizing Energy through Live Performance" [Bass Connections in Energy Team](#). Performed at [ChoreoLab](#). Reynold's Theater, 13-14 April 2018. [\[performance video\]](#) [\[overview video\]](#)

The Third Generation: Electricity Access in Developing Countries from Aerial Imagery. Data+ team video documentary. July 2017. [\[video\]](#)

Energy Storage and the Grid: Prospects and Policy. American Chemical Society. Science & the Congress Project. June 2016. [\[video\]](#)

Estimating U.S. Solar Capacity through Machine Learning. Data+ team video documentary. July 2015. [\[video\]](#)

Introduction to the Energy Data Analytics Lab. Energy Industry Fundamentals. October 2015. [\[video\]](#)

**Videos (including educational videos)**

Introduction of the Energy Data Analytics Lab. Duke University Energy Research Collaboration Workshop 2015. May 2015. [\[video\]](#)

Energy Efficiency. HackDuke: Code for Good. Opening Ceremony. November 2014. [\[video\]](#)

Electric Power Systems. Energy Industry Fundamentals. August 2014. [\[video\]](#)

Design and implementation of an energy data analysis system. Duke University Energy Research Workshop 2014. May 2014. [\[video\]](#)

Design and implementation of an energy disaggregation system. Duke University Energy Research Workshop. 2013. May 2013. [\[video\]](#)