Leanna L. House

Curriculum Vitae

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Department of Statistics
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Education

Ph.D. in Statistics, Duke University, Durham, NC, 2006
Dissertation: Non-parametric Bayesian Models in Expression Proteomic Applications
Advisors: Dr. Merlise Clyde and Dr. Robert Wolpert

M.S. in Statistics, Duke University, Durham, NC, 2003
Project: Bayesian Identification of Differentially Expressed Genes
Advisor: Dr. Merlise Clyde

M.A.T. in Curriculum Development, Cornell University, Ithaca, NY, 1999
Advisor: Dr. Avery Soloman

B.S. in Biometry and Statistics, Cornell University, Ithaca, NY, 1998

Positions

2017 - present	Deputy Director, Computational Modeling and Data Analytics (CMDA), Academy of Integrated Science, Virginia Tech, Blacksburg, VA
2015 - present	Associate Professor, Department of Statistics, Virginia Tech, Blacksburg, VA
2008 - 2015	Assistant Professor, Department of Statistics, Virginia Tech, Blacksburg, VA
2006 - 2008	Postdoctoral Fellow for Managing Uncertainty in Complex Models, Department of Mathematical Sciences, Durham University, United Kingdom
2002 - 2006	Research Assistant, Department of Statistical Sciences, Duke University, Durham, NC
2002	Intern, Battelle Memorial Institute, Columbus, OH
2000 - 2001	Researcher, Battelle Memorial Institute, Columbus, OH
1999 - 2000	Research Associate, Battelle Memorial Institute, Columbus, OH
1999	Laboratory Technician, Department of Soil and Crop Sciences, Cornell University, Ithaca, NY

Leadership Training

2017 - 2018	Academic Leaders Program, Virginia Tech, Blacksburg, VA
2015 - 2016	Women's Leadership & Mentoring Program, Virginia Tech, Blacksburg, VA

Research Interests

Data mining with data visualizations that promote human-data interaction and education in Statistics; Bayesian hierarchical modeling with an emphasis in model averaging, dimension reduction, and Bayes linear; Uncertainty quantification of computer models; Statistical applications in education, health analytics, bioinformatics, climatology, hydrology, transportation.

Funded Research

- NSF #2118240 (2021-2026). HDR Institute: Imageomics: A New Frontier of Biological Information Powered by Knowledge-Guided Machine Learning. *NSF,Directorate for Computer and Information Science and Engineering (CISE)*, PI-OSU: Berger-Wolf, T., PI-VT: Karpatne, A., Co-PIs-VT: House, L., Uyeda, J., $14,969,077 (total), $1,340,635 (VT-subAward)(Co-PI, 33% of VT, 3% of Total).

- CASERM Awarded (2020-2023). Integrating Sequential Simulation and Visual Ensemble Analytics for Applications in the Mining Sector. *Center for Advanced Subsurface Earth Resource Models (CASERM) Annual Award*, PI: Polys, N., Co-PI: House, L., Pollyea, R. $176,361(Co-PI,33%).

- Socially Determined (2018). Social Determinants of Health Personal Metrics and Population Development. *Collaboration with Socially Determined (`sociallydetermined.com`)*, PI: Singupta, S., Co-PI: Gramacy, B., House, L., $96,905(Co-PI, 40%).

- Socially Determined (2017). Socially Determined Exploratory Data Analysis. *Collaboration with Socially Determined (`sociallydetermined.com`)*, PI: Singupta, S., Co-PI: Embree, M., Gramacy, B., House, L., $44,848(Co-PI, 20%).

- General Dynamics (2016-2017). CHITA: Computer Human Interactive Text Analytics. *Collaboration with General Dynamics Mission Systems (`gdmissionsystems.com`)*, PI: North, C., Co-PI: House, L., Leman, S., Mayer, B., Poly, N. Ramakrishnan, N., $299,591(Co-PI, 20%).

- NSF #1545362 (2015-2021). NRT-DESE: UrbComp: Data Science for Modeling, Understanding, and Advancing Urban Populations. *National Science Foundation, Directorate for Education and Human Resources, Division of Graduate Education*, PI: Ramakrishnan, N., Co-PI: House, L., Embree, M., North, C., Watson, L., $2,999,238(Co-PI, 5%).

- ONR # 4720000434 / N00014-15-1-2326 (2015-2017). Data Analytics for Large Sensor Systems. *Office of Naval Research, Basic and Applied Scientific Research*, PI: Smith, E., Co-PI: Alexander, W.N., Devenport, W., House, L., Leman, S.C., $260,752(Co-PI, 17%).

- NSF #1447416 (2014-2018). BIGDATA: F: DKA: Usable Multiple Scale Big Data Analytics Through Interactive Visualization. *National Science Foundation, Directorate for Computer and Information Science and Engineering, Division of Information and Intelligence Systems*, PI: North, C., Co-PI: Chao, Y., House, L., Leman, S.C., $998,912(Co-PI, 25%).

- ONR # N00014-14-1-0719 (2014-2015). Data Analytics For Large Acoustic Array Datasets. *Office of Naval Research, Basic and Applied Scientific Research*, PI: Smith, E., Co-PI: Alexander, W.N., Devenport, W., House, L., Leman, S.C., $44,281(Co-PI, 16%).

- ICAT-ICTAS (2014-2015). Be the Data: Embodied Interaction in Bayesian Visual Analytics. *VT's Institute for Creativity, Arts, and Technology (ICAT) - Institute for Critical Technology and Science Technology (ICTAS) SEAD (Science, Engineering, Art, and Design) Proposal - Data Exploration*, PI: House, L., Co-PI: Chao, Y., Leman, S.C., North, C., Abel, T., $30,000(PI, 20%).

- NSF #1141096 (2013-2017). Critical Thinking with Data Visualization. *National Science Foundation, Directorate for Education and Human Resources, Division of Undergraduate Education*, PI: House, L., Co-PIs: Leman, S.C., McConnel, K., North, C., Ramakrishnan, N., $199,826(PI, 25%).

- NSF #1136640 (2012-2017). Dimensions: Collaborative Research: Diversity and Symbiosis: Examining the Taxonomic, Genetic, and Functional Diversity of Amphibian Skin Microbiota. *National Science Foundation, Directorate for Biological Sciences, Division of Environmental Biology*, PI: Belden, L. Co-PI: House, L., Jensen,R., Harris, R.N., Minbiole, K.P., $1,205,921(Co-PI, 25%).

- NSF Contract (2010). User-Guided Spatialization for Visualizing NSF Award Portfolios. *National Science Foundation*, PI: North, C., Co-PI: House, L., Leman, S.C., $24,999(Co-PI, 33%).

- USDA-VT (2010-2012). Systems Biology of Metabolic Regulation for Rational Metabolic Engineering in Soybean Seeds. *United States Department of Agriculture and Virginia Tech, College of Agriculture and Life Sciences Internally Allocated Funds*, PI: Collakova, E., Co-PI: House, L., $61,000(Co-PI, 50%).

- NSF #0937071 (2009-2013). Bayesian Analysis and Visual Analytics. *National Science Foundation, Directorate for Computer and Information Science and Engineering, Division of Computer and Communications Foundations*, PI: Leman, S.C, Co-PI: House, L., North, C., $499,307(Co-PI, 40%).

- Pratt & Whitney, Center for Excellence (2009). Design of Variation: Data Matching/Large Model Method. *Pratt & Whitney (`www.pw.utc.com`) Partnered with Virginia Tech*, PI: House, L., $17,364(PI, 100%).

Edited Books or Book Chapters

- House, L. and Smith, E. (2015). To Advance Science, Improve Community, and Develop Critical Thinking. In Vaidya, K., editor, *Statistics for the Curious: Why Study Statistics?* The Curious Academic Publishing.

- Clyde, M., House, L., and Wolpert, R. (2006). Nonparametric Models for Proteomic Peak Identification and Quantification. In Do, K., Muller, P., and Vannucci, M., editors, *Bayesian Inference for Gene Expression and Proteomics*, New York. Cambridge University Press.

- Banks, D., House, L., McMorris, F., Arabie, P., and Gaul, W., editors (2004). *Classification, Clustering, and Data Mining Applications.* Springer-Verlag Inc, Berlin.

Peer Reviewed Publications

- Taylor, M., Kodali, L., House, L., and North, C. (2023). Evaluating Differences in Insights from Interactive Dimensionality Reduction Visualizations Through Complexity and Vocabulary. In *Proceedings of the 18th International Joint Conference on Computer Vision, Imaging and Computer Graphics Theory and Applications (VISIGRAPP 2023) - Volume 3: IVAPP*, pages 158–165. INSTICC, SciTePress.

- Taylor, M., Mathieson, D., House, L., and North, C. (2022). Andromeda in the Classroom: Collaborative Data Analysis for 8th Grade Engineering Design. In *2022 ASEE Annual Conference & Exposition*, Minneapolis, MN. ASEE Conferences. `https://peer.asee.org/41168`.

- Ashqar, H., Elhenawy, M., Rakha, R., and House, L. (2022). Quality of Service Measure for Bike Sharing Systems. *IEEE Transactions on Intelligent Transportation Systems*, 23(9):15841–15849.

- Isernia, L., Wynne, D., House, L., and Feuerbacher, E. (2022). Dogs and Wolves Differ in Their Response Allocation to Their Owner/Caregiver or Food in a Concurrent Choice Procedure. *PeerJ*, 10:e1283.

- Hughey, M., Rebollar, E., Harris, R., Ibanez, R., Loftus, S., House, L., Minbiole, K., Bletz, M., Medina, D., Shoemaker, W., Swartwout, M., and Belden, L. (2022). An Experimental Test of Disease Resistance Function in the Skin-Associated Bacterial Communities of Three Tropical Amphibian Species. *FEMS Microbiology Ecology*, 98(3).

- Wang, M., Wenskovitch, J., House, L., Polys, N., and North, C. (2021). Bridging Cognitive Gaps Between User and Model in Interactive Dimension Reduction. *Visual Informatics*, 5(2):13–25.

- Ashqar, H. I., Elhenawy, M., Rakha, H. A., Almannaa, M., and House, L. (2021). Network and station-level bike-sharing system prediction: a san francisco bay area case study. *Journal of Intelligent Transportation Systems*, pages 1–11.

- Dahshan, M., House, L., and Polys, N. (2020). High-Dimensional Spatial Simulation Ensemble Analysis. In *Proceedings of the 9th ACM SIGSPATIAL International Workshop on Analytics for Big Geospatial Data*, BIGSPATIAL '20, New York, NY, USA. Association for Computing Machinery.

- Kodali, L., Sengupta, S., House, L., and Woodall, W. (2020). The Value of Summary Statistics for Anomaly Detection in Temporally-Evolving Networks: A Performance Evaluation Study. *Applied Stochastic Models in Business and Industry*, 36(6):980–1013.

- Maimaiti, M., Kunduri, B., Ruohoniemi, J. M., Baker, J. B. H., and House, L. L. (2019). A Deep Learning-Based Approach to Forecast the Onset of Magnetic Substorms. *Space Weather*, 17(11):1534–1552.

- Dowling, M., Wycoff, N., Mayer, B., Wenskovitch, J., Leman, S., House, L., Polys, N., North, C., and Hauck, P. (2019). Interactive Visual Analytics for Sensemaking with Big Text. *Journal of Big Data Research*, 16:49–58.

- Dowling, M., Wenskovitch, J., Fry, J. T., Leman, S., House, L., and North, C. (2019). SIRIUS: Dual, Symmetric, Interactive Dimension Reductions. *IEEE Transactions on Visualization and Computer Graphics*, 25(1):172–182.

- Ashqar, H., Almannaa, M., Elhenawy, Mohammedand Rakha, H., and House, L. (2019). Smartphone Transportation Mode Recognition Using a Hierarchical Machine Learning Classifier and Pooled Features from Time and Frequency Domains. *IEEE Transactions on Intelligent Transportation Systems*, 20(1):244–252.

- Wenskovitch, J., Bradel, L., Dowling, M., House, L., and North, C. (2018). The Effect of Semantic Interaction on Foraging in Text Analysis. In *IEEE Conference on Visual Analytics Science and Technology (VAST), Berlin, Germany.*

- Self, J. Z., Dowling, M., Wenskovitch, J., Crandell, I., Wang, M., House, L., Leman, S., and North, C. (2018). Observation-Level and Parametric Interaction for High-Dimensional Data Analysis. *ACM Transactions on Interactive Intelligent Systems*, 8(2):1–36.

- Wenskovitch, J., Crandell, I., Ramakrishnan, N., House, L., Leman, S., and North, C. (2018). Towards a Systematic Combination of Dimension Reduction and Clustering in Visual Analytics. *IEEE Transactions on Visualization and Computer Graphics*, 24(1):131–141.

- Chen, X., Self, J. Z., House, L., Wenskovitch, J., Sun, M., Wycoff, N., Evia, J. R., Leman, S., and North, C. (2018). Be the Data: Embodied Visual Analytics. *IEEE Transactions on Learning Technologies*, 11(1):81–95.

- Zeitz, J., Self, N., House, L., Evia, J. R., and North, C. (2018). Bringing Interactive Visual Analytics to the Classroom for Developing EDA Skills. *Journal of Computing Sciences in Colleges*, 33(3):115–125.

- Vasta, R., Crandell, I., Millican, A., House, L., and Smith, E. (2017). Outlier Detection for Sensor Systems (ODSS): A Matlab Macro for Evaluating Microphone Sensor Data Quality. *Sensors*, 17(10).

- Ashqar, H. I., Elhenawy, M., Almannaa, M. H., Ghanem, A., Rakha, H. A., and House, L. (2017). Modeling Bike Availability in a Bike-Sharing System Using Machine Learning. In *5th IEEE International Conference on Models and Technologies for Intelligent Transportation Systems (MT-ITS)*, Napoli, Italy.

- Chen, X., Zeitz Self, J., Sun, M., House, L., and North, C. (2016). Be the Data: Social Meetings with Visual Analytics. In *International Workshop on Visualization and Collaboration (VisualCol 2016)*, pages 1–8.

- Han, C., House, L., and Leman, S. (2016). Expert-Guided Generative Topographical Modeling with Visual to Parametric Interaction. *PloS one*, 11(2):e0129122.

- Chen, X., House, L., Zeitz Self, J., Leman, S., Robertson Evia, J., Fry, J., and North, C. (2016). Be the Data: An Exploratory Study of Embodied Experience for Learning Data Analytics. In *American Educational Research Association (AERA) Annual Meeting.*

- Chen, X., Zeitz Self, J., House, L., and North, C. (2016). Be the Data: A New Approach to Immersive Analytics. In *IEEE Virtual Reality, Immersive Analytics*.

- Self, J., Hu, X., House, L., Leman, S., and North, C. (2016). Designing Interactive Algorithms with Visual Analytics. In *CHI 2016 Workshop on Human-Centered Machine Learning (HCML)*.

- Bradel, L., Wycoff, N., House, L., and North, C. (2015). Big Text Visual Analytics in Sensemaking. In *IEEE International Symposium on Big Data Visual Analytics (BDVA)*, pages 1–8.

- House, L., Leman, S., and Han, C. (2015). Bayesian Visual Analytics (BaVA). *Journal of Statistical Analysis and Data Mining*, 8(2):1–13.

- Han, C., Leman, S., and House, L. (2015). Covariance-Guided Mixture Probabilistic Principal Component Analysis (C-MPPCA). *Journal of Computational and Graphical Statistics*, 24(1):66–83.

- Leman, S., House, L., and Hoegh, A. (2015). Developing a New Interdisciplinary Computational Analytics Undergraduate Program: A Qualitative-Quantitative-Qualitative Approach. *The American Statistician*, 59(4):397–408.

- Walke, J., Becker, M., Teotonio, T., Loftus, S., House, L., Minbiole, K., and Belden, L. (2015). Community Structure and Function of Amphibian Skin Microbes: an Experimental with Bullfrogs Exposed to Chytrid Fungus. *PLoS ONE*, 10(10):e0139848.

- Belden, L., Hughey, M., Rebollar, E., Umile, T., Loftus, S., Burzynski, E., Minbiole, K., House, L., Jensen, R., Becker, M., Walke, J., Medina, D., Ibáñez, R., and Harris, R. (2015). Panamanian Frogs Host Unique Skin Bacterial Communities. *Frontiers in Microbiology*, 6:1171.

- Franck, C., Koffarnus, M., House, L., and Bickel, W. (2015). Accurate Characterization of Delay Discounting: a Multiple Model Approach Using Approximate Bayesian Model Selection and a Unified Discounting Measure. *Journal of the Experimental Analysis of Behavior*, 103(1):218–233.

- Bradel, L., North, C., House, L., and Leman, S. (2014). Multi-Scale Semantic Interaction for Text Analytics. In *IEEE Symposium on Visual Analytics Science and Technology 2014, November 9-14, Paris, France*, pages 163–172.

- Liao, H., Krometis, L. H., Hession, W. C., House, L. L., Kline, K., and Badgley, B. D. (2014). Hydrometeorological and Physicochemical Drivers of Fecal Indicator Bacteria in an Urban Stream Bottom Sediments. *Journal of Environmental Quality*, 43(6):2034–2043.

- Walke, J., Becker, M., Loftus, S., House, L., Cormier, G., Jensen, R., and Belden, L. (2014). Amphibian Skin May Select for Rare Environmental Microbes. *Journal of the International Society for Microbial Ecology*, 8:2207–2217.

- Leman, S., House, L., Szarka, J., and Nelson, H. (2014). Life on the Bubble: Who's In and Who's Out of March Madness? *Journal of Quantitative Analysis of Sports*, 10(3):315–328.

- Hu, X., Bradel, L., Maiti, D., House, L., North, C., and Leman, S. (2013). Semantics of Directly Manipulating Spatializations. *IEEE Transactions on Visualization and Computer Graphics*, 19(12):2052–2059.

- Liao, H., Krometis, L.-A., Hession, C., Kline, K., House, L., and Badgely, B. (2013). Parameters Associated with Fecal Indicator Bacteria Concentrations in the Water Column and Bottom Sediments of Stroubles Creek, Virginia, USA. In *2013 Kansas City, Missouri, July 21-July 24, 2013*, 1. American Society of Agricultural and Biological Engineers.

- Rougier, J. C., Goldstein, M., and House, L. (2013). Second-Order Exchangeability Analysis for Multimodel Ensembles. *Journal of the American Statistical Association*, 108(503):852–863.

- Gudmestad, A., House, L., and Geeslin, K. (2013). What a Bayesian Analysis Can Do for SLA: New Tools for the Sociolinguistic Study of Subject Expression in L2 Spanish. *Language Learning*, 63(3):371–399.

- Leman, S. C., House, L., Maiti, D., Endert, A., and North, C. (2013). Visual to Parametric Interactions (V2PI). *PLoS ONE*, 8(3):e50474.

- Leman, S. C. and House, L. (2012). Improving Mr. Myagi's Coaching Style: Teaching Data Analytics with Interactive Data Visualizations. *Chance*, 25(4):4–10.

- House, L. (2011). Verifying Reification with Application to a Rainfall–Runoff Computer Simulator. *Journal of Agricultural, Biological, and Environmental Statistics*, 16(4):513–530.

- Endert, A., Han, C., Maiti, D., House, L., Leman, S., and North, C. (2011). Observation-Level Interaction with Statistical Models for Visual Analytics. In *Visual Analytics Science and Technology (VAST), 2011 IEEE Conference*, pages 121–130.

- Tawfik, A. M., Szarka, J., House, L., , and Rakha, H. (2011). Disaggregate Route Choice Models Based on Driver Learning Patterns and Network Experience. In *Intelligent Transportation Systems (ITSC), 14th International IEEE Conference*, pages 445–450.

- House, L., Clyde, M. A., and Wolpert, R. L. (2011). Bayesian Nonparametric Models for Peak Identification in MALDI-TOF Mass Spectroscopy. *The Annals of Applied Statistics*, 5(2B):1488–1511.

- Banks, D., House, L., and Killourhy, K. (2009). Cherry-Picking for Complex Data: Robust Structure Discovery. *Philosophical Transactions of the Royal Society, Series A*, 367:4339–4359.

- Stangl, D., Banks, D., House, L., and Reiter, J. (2006). Progressive Mastery Testing: Does It Increase Learning and Retention? Yes and No. In *Proceedings of the Seventh International Conference on Teaching Statistics. International Statistical Institute.*

- House, L., Clyde, M. A., and Huang, Y. T. (2006). Bayesian Identification of Differential Gene Expression Induced by Metals in Human Bronchial Epithelial Cells. *Bayesian Analysis*, 1(1):105–120.

- House, L. and Banks, D. (2004). Cherry-Picking as a Robustness Tool. In *Classification, Clustering, and Data Mining Applications*, pages 197–206, Berlin. Springer-Verlag Inc.
- House, L. and Banks, D. (2004). Robust Multidimensional Scaling. In Antoch, J., editor, *COMPSTAT 2004 — Proceedings in Computational Statistics*, pages 251–259, Berlin. Physica-Verlag HD.

Non-Peer Reviewed Publications

- House, L. and Leman, S. (2014). Analytical Attire. In *AMSTAT News*, volume 439, pages 32–33. American Statistical Association.
- Endert, A., North, C., Leman, S., House, L., Han, C., Maiti, D., and Roberts, L. (2009). User-Guided Spatialization for Visualizing NSF Award Portfolios. Technical report, Virginia Tech.
- Clyde, M., House, L., Tu, C., and Wolpert, R. (2005). Bayesian Nonparametric Function Estimation Using Overcomplete Representations and Lévy Random Field Priors. *Statistische und Probabilistische Methoden der Modellwahl*, Oberwolfach Report 47(`http://www.ems-ph.org/journals/owr/owr.php`):2628–2633.

Publications in Progress

- Vance, E., Trumble, I., Alzen, J., and House, L. (In progress). The Content of Statistics and Data Science Collaborations: the QQQ Framework. Technical report, `https://arxiv.org/abs/2209.04887`.
- Dahshan, M., Poly, N., House, L., North, C., Pollyea, R., Turton, T. L., and Rogers, D. H. (Submitted). Human-machine partnerships at the exascale: Exploring simulation ensembles through image databases. *Journal of Visualization*.
- Dahshan, M., Youssef, Y., Poly, N., House, L., and Pollyea, R. (Submitted). Visual Exploration of High-Dimensional Spatialized Ensembles. In *15th International Conference on Information Visualization Theory and Applications (IVAPP 2024)*.
- Tilashalsk, M., Ellis, K., and House, L. (In Progress). Solving the VRP - Heuristic Enhancements that Consider Dataset Characteristics. Technical report, Virginia Tech.

Seminars/Panels

- "Charting the Future of the HDR Ecosystem: Crafting a Collaborative Research." NSF HDR Ecosystem Conference, Denver, CO, October 2023.
- "Interactive, Probabilistic WMDS (IP-WMDS): Accounting for Uncertainty When Exploring High-dimensional Data Visually", Harvard Biostatistics, B3D Seminar Series, Virtual, April 2022.
- "Baby Bayes." Lecture, CANSSI/SAMSI Summer School on Mathematical and Statistical Model Uncertainty, Simon Fraser University, Vancouver, CA, July 2018.

- Invited panelist for the "Transformation in Data Analytics: What's New on the Horizon? Healthcare Analytics Symposium", Roanoke, VA, August 2018.
- "Baby Bayes." Lecture, CANSSI/SAMSI Summer School on Mathematical and Statistical Model Uncertainty, Simon Fraser University, Vancouver, CA, July 2018.
- "Human-in-the-Loop Analytics: Uncertainty Quantification, Expert Judgement, and Data Exploration." Invited Statistical Sciences Seminar Series, Los Alamos National Labs, Los Alamos, NM, July 2018.
- "Incorporating Uncertainty within Human-in-the-Loop Analytics for Data Exploration." Seminar, Department of Statistical Science, Duke University, Durham, NC, April 2018.
- "Bayesian Methods, Visual Analytics, Education: Theories, Methods and Applications of All Three." Seminar, University of Colorado Boulder, Department of Applied Mathematics, CO, October 2017.
- Invited panelist for the "Text and Data Mining Forum", Virginia Tech, University Libraries, April 2017.
- "Be the Data and More: Using Interactive, Analytic methods to Enhance Learning From Data for Students." Seminar, New York University, Department of Applied Statistics and Data Science, NY, October 2016.
- "Bayesian Visual Analytics (BaVA): In Practice and in the Classroom." Seminar, University of Minnesota, School of Statistics, Minneapolis, MN, September 2014.
- "Visual to Parametric Interaction: Including the Expert in Exploratory Data Analyses." Seminar, George Mason University, Department of Statistics, Fairfax, VA, October 2013.
- "Second-Order Exchangeable Functions and Multi-deterministic Computer Models." Seminar, Simon Fraser University, Department of Statistics and Actuarial Science, Vancouver, Canada, December 2010.
- "Second-Order Exchangeable Functions Within Application to Multi-deterministic Computer Models." Seminar, Brigham Young University, Department of Statistics, Provo, UT, October 2010.
- "Bayesian Visual Analytics (BaVA): A New Way to Enhance Sense-making." Seminar, Los Alamos National Laboratory, Statistical Sciences Group, Los Alamos, NM, May 2010.
- "Bayesian Assessment of System Condition Uncertainty in Computer Models." Seminar, Cornell University, Department of Operations Research, Ithaca, NY, November 2009.
- "Functional Data Analysis Using A Lévy Random Fields Model for Multi-spectra Peak Identification and Classification." Seminar, Dortmund University, Dortmund, Germany, July 2007.
- "Bayesian Identification of Differential Gene Expression Induced by Metals in Human Bronchial Epithelial Cells." Seminar, Environmental Protection Agency, Human Health Division, Chapel Hill, NC, February 2003.

Conference and Workshop Talks

- "Image Analytics Details." In Our Back Yards: Human Impacts on Pollinator and Plant Populations in Local Environments at QUEST; TeacherPrep, Princeton University, Princeton, NJ July 2023.
- "Andromeda in Action!" Research Pitch at Datapolooza, Columbus, Ohio, August 2023.
- "Quantifying Uncertainty of Simulated Populations." Invited talk at the Computational and Methodological Statistics (CMStatistics) Conference, Berlin, Germany, December 2023.
- "Population Sampling: One Approach for Modeling Uncertainty when Conditioning on Human Populations." Invited talk at 64th ISI World Statistics Congress, Ottawa, Canada, July 2023.
- "Quantifying Uncertainty of Simulated Populations." Invited talk at the Spring Research Conference (SRC), Banff, Canada, May 2023.
- "Humans, machine learning, and more." Machine Learning: Discovering the Rules of Life through Images at QUEST; TeacherPrep, Princeton University, Princeton, NJ July 2022.
- "Modeling Populations." Contributed Speaker, ISBA World Meeting, Montreal, Canada, June 2022.
- "Tutorial: Using R in Data Science." Invited talk, Women in Data Science, Blacksburg, VA, April 2022.
- "Critical Thinking is Essential. Why not teach it?" Invited talk, ASA Women in Data Science, October 2021.
- "The Human Role in Data Science." Invited panelist for Women in Data Science, Blacksburg, VA, April 2021.
- "Evaluating Change in Learning from Different Forms of Interactive Visualizations with a Large Case Study." Invited talk at the Computational and Methodological Statistics (CMStatistics) Conference, London, England, December 2019.
- "The Role of Statistics within Human-in-the-Loop Analytics." Invited speaker at the Cornell Celebration of Statistics and Data Science 2019, Ithaca, NY, September 2019.
- "Educating for Cross Disciplinary Science: Virginia Tech Computational Modeling and Data Analytics Program." Invited Speaker, Symposium on Imaging and Visualization in Science, Charlottesville, VA December 2018.
- "Formalizing the Use of Expert Judgement in Uncertainty Quantification of Computer Models." Invited talk at the Computational and Methodological Statistics (CMStatistics) Conference, Pisa, Italy, December 2018.
- "Human-in-the-Loop Analytics: Two Approaches and Two Applications." Invited talk in third workshop for the *UQ for Complex Systems Program* at the Isaac Newton Institute for Mathematical Sciences, Cambridge, UK, March 2018.

- "Using Bayesian Visual Analytics to Conceptualize Uncertainty and Explore data." Invited talk at the Computational and Methodological Statistics (CMStatistics) Conference, London, UK, December 2017.
- "Critical Thinking with Data Visualization." Presenter for half-day workshop at the United States Conference on Teaching Statistics (USCOTS), State College, PA, May 2017.
- "Critical Thinking with Data Visualization." Leader of a break-out session at the United States Conference on Teaching Statistics (USCOTS), State College, PA, May 2017.
- "Bayesian Visual Analytics (BaVA)." Invited talk at the Joint Statistical Meetings, Chicago, IL, August 2016.
- "NRT-DESE: UrbComp: Data Science for Modeling, Understanding, and Advancing Urban Populations; Evaluation, Overview, Findings, and Challenges." NRT Evaluator Workshop, Berkeley, CA, May 2016.
- "Be the Data: Bringing Research in Analytics to Middle School." Invited speaker at Dr. Robert Wolpert's birthday conference, Duke University, Durham, NC, October 2015.
- "Don't Forget: Quantitative Statistics Courses are Very Qualitative." Roundtable discussion leader at the Joint Statistical Meetings, Seattle, WA, August 2015.
- "Be the Data: Bringing Technical Research to Middle School." Invited host of a *play date* with the Institute for Creative Arts and Technology (ICAT) at Virginia Tech, Blacksburg, VA, May 1, 2015.
- "Visual Analytics in the Classroom: Developing Analytical Skills While Interacting with Data." MeetUp discussion leader at the Visual Analytics Science and Technology (VAST), 2014 IEEE Conference, Paris, France, November 2014.
- "Teaching Introductory Statistics from a Bayesian Perspective." Roundtable discussion leader at the Joint Statistical Meetings, Montreal, Canada, August 2014.
- "Expert-Guided Generative Topographical Mapping with Visual to Parametric Interaction." Invited speaker at the Joint Statistical Meetings, Montreal, Canada, August 2013.
- "Assessing Simulator Uncertainty Using Evaluations From Several Different Simulators." Invited speaker at the Spring Research Conference, Chicago, IL, June 2011.
- "Assessing Simulator Uncertainty Using Evaluations From Several Different Simulators." Invited speaker at the Accelerating Industrial Productivity via Deterministic Computer Experiments and Stochastic Simulation Workshop, Isaac Newton Institute for Mathematical Sciences, Cambridge, United Kingdom, September 2011.
- "Bayesian Visual Analytics (BaVA)." Invited co-speaker for SAS M2011 Data Mining Conference, October 2010.
- "An Application of Reification to a Rainfall-Runoff Computer Model." Invited speaker for the Subjective Bayes Workshop, Warwick University, United Kingdom, December 2009.

- "Second Order Exchangeable Emulators to Assess Initial Condition Uncertainty." Contributed speaker for Spring Research Conference on Statistics in Industry and Technology, Vancouver, Canada, May 27 - 29, 2009.
- "An Application of Reification to a Rainfall-Runoff." Topic contributed talk at the Joint Statistical Meetings, Washington, D.C., August 1-6, 2009.
- "Learning About Complex Physical Systems from Multiple Computer Models." Topic contributed talk at the Joint Statistical Meetings, Denver, CO, August 2008.
- "Second Order Exchangeable Emulators to Assess Initial Condition Uncertainty." Young investigator presentation at the Bayesian Workshop for Calibration and Validation of Computer Computer Models, Macquarie University, Sydney, Australia, July 2008.
- "Functional Data Analysis Using A Lévy Random Fields Model for Multi-spectra Peak Identification and Classification." Contributed speaker at the Workshop on Bayesian Nonparametric Regression: Theory, Methods and Applications, Isaac Newton Institute for Mathematical Sciences, Cambridge, United Kingdom, August 2007.
- "Computer Model and Bayes Linear Discussion." Discussion leader at Dortmund University, Dortmund, Germany, July 2007.
- "Mass Spectrometry Feature Extraction for Expression Proteomic Applications Using a Lévy Random Fields Model." Invited speaker at the Workshop on Statistical Bioinformatics and Stochastic Systems Biology, Newcastle, United Kingdom, April 2007.
- "A Bayesian, Nonparametric Approach for Expression Proteomic Analyses." Topic contributed talk at the Joint Statistical Meetings, Seattle, WA, August 2006.
- "What Do Students Remember from Statistics Class?" Invited talk at the Joint Statistical Meetings, Minneapolis, MN, August 2005.
- "Bayesian Nonparametric Approach for Analyzing Mass Spectrometry Data." Topic Contributed talk at the Joint Statistical Meetings, Toronto, Canada, August 2004.
- "Cherry Picking: Multidimensional Perspective." Invited Session Speaker at the Quality and Productivity Research Conference, Research Triangle Park, NC, May 2004.
- "Bayesian Identification of Differential Gene Expression Induced by Metals in Human Bronchial Epithelial Cells." Contributed talk at the Joint Statistical Meetings, San Francisco, CA, August 2003.

Poster Presentations

- "Education and Outreach in Imageomics: Engaging Communities to Advance Science." NSF HDR Ecosystem Conference, Denver, CO, October 2023.
- "Be the Data." ISBA World Meeting, Sardinia, Italy, June 2016.
- "How We Think Matters; Using Bayes to Improve Cognitive Dimensionality." ISBA World Meeting, Cancun, Mexico, July 2014.

- "Critical Thinking with Data Visualization." ISBA World Meeting, Kyoto, Japan, June 2012.
- "Bayesian Visual Analytics", Case Studies in Bayesian Statistics and Machine Learning, Pittsburgh, PA, November 2011.
- "Reinforcing Reification with Application to a Rainfall-Runoff Computer Model." Valencia 8, World Meeting on Bayesian Statistics, Benidorm, Spain, June 2010.
- "Learning About Complex Physical Systems from Multiple Computer Models" ISBA World Meeting, Hamilton Island, Australia, July 2008.
- "Expression Proteomic Analysis Using Marked Point Processes." Valencia 8, World Meeting on Bayesian Statistics, Benidorm, Spain, June 2006.
- "Bayesian Nonparametric Approach for Analyzing Mass Spectrometry Data." ISBA World Meeting, Viña del Mar, Chile, May 2004.
- "Empirical Bayes Analysis of Microarray Data." Valencia 7, World Meeting on Bayesian Statistics, Tenerife, Spain, June 2002.

Appearances in Media

- University of California Los Angeles (UCLA), The Daily Bruin, Mar. 17, 2015, "Q&A: Statistics analyst talks prestige bias in March Madness", `http://dailybruin.com/2015/03/17/qa-statistics-analyst-talks-prestige-bias-in-march-madness/`
- The Oklahoman, Feb. 27, 2015, "NCAA Tournament: Evidence Says Name Brand Programs Will Get the Selection Committee's Nod Every Time", `http://newsok.com/ncaa-tournament-evidence-says-name-brand-programs-will-get-the-selection-committees-nod-every-time/article/5397173`
- ASA News Release, Feb. 24, 2015, "A Marquee Bias Can Influence Which 'Bubble' Teams Get Into March Madness", `http://www.amstat.org/newsroom/pressreleases/2015-MarqueeFactorHelpsTeamsGetintoMarchMadness.pdf`
- Sports Are 80 Percent Mental, Mar 3, 2011, "Is There Bias In Selection Of March Madness Teams?" by Dan Peterson, `http://blog.80percentmental.com/2011/03/is-there-bias-in-selection-of-march.html`
- fromtheeditr, March 2, 2011, "The Bias Behind *Bracketology*: A Study" by Dan Smith, `http://fromtheeditr.blogspot.com/2011/03/bias-behind-bracketology-study.html`
- WSLS, Channel 10, Roanoke, VA, March 2, 2011, "Stats professors: Virginia Tech up against odds for NCAA tourney bid" by Ken Heineck
- WDBJ, Channel 7, Roanoke, VA, March 1, 2011, "Calculating VT's odds of making the NCAA Tournament. Could biases have affected VT getting a bid in 2010?"
- Virginia Tech News, March 1, 2011, "March Madness: Statisticians quantify entry biases," by Catherine Doss

Also appeared:

- MSN Fox Sports, http://msn.foxsports.com/collegebasketball/story/MARCH-MADNESS-STATISTICIANS-QUANTIFY-ENTRY-BIASES-69543943.
- Science Daily, www.sciencedaily.com/releases/2011/03/110301111259.htm
- Science Blog, http://scienceblog.com/43241/march-madness-statisticians-quantify-entry-biases/
- Science Newsline Medicine, http://www.sciencenewsline.com/medicine/2011030112000067.html
- Red Orbit, http://www.redorbit.com/news/sports/2005304/march_madness_statisticians_quantify_entry_biases/

- Tech Talk Live, February 28, 2011, Mentioned by Coach Seth Greenberg during an interview with Bill Roth
- College of Science Magazine, Virginia Tech, September 13, 2010, "Statisticians help researchers see their data in a new way," by Catherine Doss
- College of Science Magazine Video, Virginia Tech; http://www.science.vt.edu/media/statistics-house-leman-video.html
- The Washington Post, March 17, 2010, "Hokies turn to statistic for answers to NCAA snub," by Mark Viera; http://voices.washingtonpost.com/hokies-journal/2010/03/hokies_turn_to_statistic_for_a.html#more
- Richmond Times Dispatch, Mar 16, 2010, "Virginia Tech stats professors doing NCAA tournament study for Greenberg," by Darryl Slater; http://www.mytimesdispatch.com/index.php/sports/comments/virginia_tech_stats_professors_doing_ncaa_tournament_study_for_greenberg/11450/

Teaching

- Professor for STAT 1014: Data in Our Lives, Virginia Tech
- Professor for STAT 2004: Introductory Statistics, Virginia Tech
- Professor for CMDA 2014: Data Matter, Virginia Tech
- Team-Professor for ISC 1(2)115/1(2)116: Integrated Science Curriculum, Virginia Tech
- Professor for STAT 3104: Probability Distributions, Virginia Tech
- Team-Professor for CMDA/STAT/CS 3654: Introductory Data Analytics and Visualization, Virginia Tech
- Professor for STAT 4214/5214G: Methods of Regression Analysis, Virginia Tech
- Professor for STAT 4444/5444G: Applied Bayesian Statistics, Virginia Tech
- Professor for STAT 5104: Probability and Distribution Theory, Virginia Tech
- Professor for STAT 5365: Hierarchical Models, Virginia Tech
- Tutor for Calculus/Probability, Durham University, United Kingdom
- Teaching Assistant for Intro. Statistics, Duke University
- Statistics Tutor in Center for Learning and Teaching, Cornell University
- Teaching Assistant for pre-calculus in Department of Education, Cornell University

Advising

- Current, PhD Co-advisor Member, Statistics, Caleb Stakun-Pickering
- Current, PhD Co-advisor Member, Statistics, Jared Clark
- Current, PhD Committee Member, Biology, Caleb Carpenter
- 2023, PhD Co-advisor, Industrial Systems Engineering, Melissa Tilashalski
- 2023, PhD Co-advisor, Statistics, Chris Grubb
- 2023, PhD Committee Member, Statistics, Erica Porter
- 2023, PhD Committee Member, Statistics, Christian Ryan
- 2022, MA Committee Member, Computer Science, Mia Taylor
- 2021, MA Advisor, Data Analysis and Applied Statistics, Hao Xui, Civil Engineering
- 2021, PhD Committee Member, Statistics, David Austin Cole
- 2021, PhD Committee Member, Statistics, Adam Edwards
- 2021, PhD Committee Member, Computer Science, Mai Dahshan
- 2021, PhD Committee Member, Civil Engineering, Maha Elouni
- 2020, PhD Advisor, Statistics, Lata Kodali
- 2020, PhD Committee Member, Fisheries and Wildlife Sciences, George Brooks
- 2020, PhD Committee Member, Computer Science, Michelle Dowling
- 2020, PhD Committee Member, Dairy Science, Douglas Liebe
- 2020, PhD Committee Member, Statistics, Zhang, Boya
- 2019, MA Advisor, Data Analysis and Applied Statistics, Maimaitirebike (Muhammad) Maimaiti, Electrical Engineering
- 2019, PhD Committee Member, Statistics, Paul Sabin
- 2019, PhD Committee Member, Statistics, Jiangeng Huang
- 2019, PhD Committee Member, Statistics, Thomas Metzger
- 2018, PhD Committee Member, Statistics, Zhang Lin
- 2018, PhD Committee Member, Computer Science, Parang Saraf
- 2018, PhD Co-Advisor, Civil and Environmental Engineering, Huthaifa Ashqar
- 2017, PhD Committee Member, Statistics, Ian Crandell
- 2017, PhD Committee Member, Statistics, Yuhyun Song
- 2017, PhD Committee Member, Agriculture Economics, Ling Yu
- 2016, PhD Committee Member, Statistics, Marcos Carzolio
- 2016, PhD Committee Member, Computer Science, Jessica Self
- 2016, PhD Advisor, Statistics, Stephen Loftus
- 2016, MS Co-Advisor, Xin Chen
- 2015, PhD Committee Member, Computer Science, Lauren Bradel
- 2015, PhD Committee Member, Biosystems Engineering, Hehuan Liao
- 2014, PhD Committee Member, Statistics, Lucas Roberts
- 2014, PhD Committee Member, Statistics, Youjia Fang
- 2014, PhD Committee Member, Statistics, Kevin Shropshire
- 2014, PhD Committee Member, Statistics, Mark Seiss
- 2013, PhD Committee Member, Statistics, Lulu Cheng

- 2012, PhD Co-Advisor, Statistics, Chao Han
- 2012, PhD Committee Member, Statistics, Dipayan Maiti
- 2012, PhD Committee Member, Statistics, Ciro Velasco-Cruz
- 2010, PhD Committee Member, Statistics, Jinsong Chen
- 2009, PhD Committee Member, Statistics, Jake Zielin
- 2012-Dec 2016, Undergraduate Academic Advising for approximately 50 students per year

Service to the Field

- Spring 2022-Present, Assoc. Editor of Journal, *Data Science in Science*
- Fall 2021 - Present, Director of Education and Community for the Imageomics Institute (`imageomics.osu.edu/`)
- Spring 2019 - Spring 2021, Publications Officer for the American Statistical Association (ASA), Bayesian Statistical Science Section
- Spring 2018 - Fall 2022, Secretary for the Section on Bayesian Education Research and Practice (BERaP) in the International Society for Bayesian Analysis (ISBA)
- Spring 2017 - Spring 2018, Member of committee to start the Section on Bayesian Education Research and Practice (BERaP) in the International Society for Bayesian Analysis (ISBA)
- Summer 2016, Review panelist for NRT proposal to NSF
- Spring 2014 - Fall 2015, Member of Program Committee for VAST 2015
- Spring 2013 - Fall 2014, Member of Program Committee for VAST 2014

(Select) University Service for Virginia Tech

- Fall 2022 - Present, Member of University Athletic Committee
- Fall 2020 - 2023, Member of IT Services and Systems Committee
- Spring 2021 - Fall 2021, Member of College of Science **Dean search committee**
- Spring 2019-Fall 2020, Member of Senate Sub-Committee to assess VT teaching evaluation
- Fall 2016-Spring 2019, Lead of Curriculum Committee for the Destination Area, Data and Decision Sciences (DADS)
- Spring 2015 - Fall 2016, Member of College of Science **Dean search committee**
- Fall 2015-Spring 2016, Member of **University Steering Committee** for Beyond Boundaries
- Fall 2013-Spring 2014, Member of University Council
- Fall 2012-Spring 2016, Advisor for Stream Research, Education, and Management
- Fall 2012-Spring 2015, Mentor for the Curie Living Center

(Select) College Service for the College of Science (COS), Virginia Tech

- Fall 2021- Spring 2023, Member of COS Diversity Committee
- Fall 2017-Spring 2019, Member of College of Science Faculty Association Steering Committee (COSFA-SC)
- Summer 2017- Present, **Deputy Director** of Computational Modeling and Data Analytics (CMDA)
- Fall 2016-Present, Member of CMDA Curriculum Committee
- Fall 2015-Present, Judge for DataFest and other data competitions at Virginia Tech
- Fall 2012-Spring 2018, Member of College of Science Curriculum Committee, Virginia Tech
- Summer 2012-Spring 2015, **Junior Lead** of committee to develop a new CMDA undergraduate degree for in the College of Science, Virginia Tech
- Summer 2011-Spring 2015, Member of committee to develop an Integrated Science Curriculum (ISC) for undergraduate students at Virginia Tech

(Select) Department Service for Statistics, Virginia Tech

- Fall 2023-Present, Chair of Department of Statistics Teaching Evaluation Committee
- Fall 2020-Spring 2023, Member of Department of Statistics Personnel Committee
- Fall 2018-Present, Faculty advisor for STAT Lab
- Fall 2016-Present, Member of Department of Statistics Graduate Committee
- Fall 2016-Present, Member or Chair of Department of Statistics Diversity Committee
- Fall 2012-Summer 2017, **Co-Coordinator** of Undergraduate Statistics

Memberships

- American Statistical Association
- International Society for Bayesian Analysis