

## Brian Hartman, PhD, ASA

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### Academic Appointments

- Associate Professor of Statistics and Actuarial Program Coordinator, Brigham Young University, August 2020 - Present
- Assistant Professor of Statistics and Actuarial Program Coordinator, Brigham Young University, July 2015 - August 2020
- Assistant Professor of Actuarial Science, University of Connecticut, August 2011 - June 2015
- Post-doctoral Fellow in Actuarial Science, University of Waterloo, August 2010 - August 2011

### Education

- Ph.D. Statistics, Texas A&M University, 2010
  - Dissertation Advisor: Bani K. Mallick
  - Dissertation Title: Bayesian Hierarchical, Semiparametric, and Nonparametric Methods for International New Product Diffusion
- Associate of the Society of Actuaries, 2008
- B.S. Actuarial Science, Minor Economics, Brigham Young University, 2006

### Refereed Publications

- Richardson, R., Hartman, B., Allen, S.,\* Anderson, J.,\* Christensen, M.,\* Gerratt, M.,\* and Walker, A.\* (2024) Using Dynamic Linear Models with Changepoints to Understand Trends in the Auto Insurance Industry. To appear in *Variance*.
- Cote, M.-P., Hartman, B., Mercier, O.,\* Meyers, J.,\* Cummings, J.,\* and Harmon, E.\* (2024) Synthesizing Property & Casualty Ratemaking Datasets using Generative Adversarial Networks. To appear in *Variance*.
- Hartman, B., Larson, C.,\* Kunkel, C., Wight, C.,\* Warr, R. (2023) A Two-Part Model of the Individual Costs of Chronic Kidney Disease. *North American Actuarial Journal*. DOI: 10.1080/10920277.2023.2177676.
- Ott, A.,\* Zabriskie, B., Hartman, B. (2022) Predicting Ambulatory Care Sensitive Emergency Department Admissions. *Journal of Hospital Management and Health Policy*, 6. doi:10.21037/jhmlhp-22-3
- Cummings, J.\* and Hartman, B. (2022) Using Machine Learning to Better Model Long-term Care Insurance Claims. *North American Actuarial Journal*. 26(3), 470-483.
- Hartman, B., Dixon, C.,\* and Walch, A. (2022) Market-based Model Selection with an Application in Commercial Auto Ratemaking. *Variance*. 15(1).
- Matthews, S.\* and Hartman, B. (2022) Machine Learning in Ratemaking, an Application in Commercial Auto Insurance. *Risks*, 10(4), 80. Selected as cover article.
- Matthews, S.\* and Hartman, B. (2022) mSHAP: SHAP Values for Two-Part Models. *Risks* 10(3).
- Heaton, M., Ingersoll, C.,\* Berrett, C., Hartman, B., and Sloan, C. (2021) A Bayesian Approach to Real-time Spatiotemporal Prediction Systems for Respiratory Syncytial Virus. *Spatial and Spatiotemporal Epidemiology*. 38, August 2021.

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\* denotes student researcher

- Gibbs, Z.\* and Hartman, B. (2021) Using Asymmetric Cost Matrices to Optimize Wellness Intervention. *North American Actuarial Journal*. 25:1, 62-72.
- Hartman, B., Owen, R., and Gibbs, Z.\* (2021) Predicting High-cost Health Insurance Members through Boosted Trees and Oversampling: An Application Using the HCCI Database. *North American Actuarial Journal*. 25:1, 53-61.
- Gibbs, Z.,\* Groendyke, C., Hartman, B., and Richardson, R. (2020) Modeling County-level Spatio-temporal Mortality Rates using Dynamic Linear Models. *Risks*, 2020, 8(4), 117.
- Hartman, B., Groendyke, C., and Engler, D. (2020) Bayesian Multivariate Regime-switching Models and the Impact of Correlation Structure Misspecification in Variable Annuity Pricing. *Scandinavian Actuarial Journal*. 2020:2. 152-171.
- Pugh, S.\*, Heaton, M., Hartman, B., Berrett, C., Sloan, C., Evans, A., Tebeb, G., Wu, P., Hartert, T., and Lee, R. (2019) Estimating Seasonal Onsets and Peaks of Bronchiolitis with Spatially and Temporally Uncertain Data. *Statistics in Medicine*, 38(11), 1991-2001.
- Richardson, R. and Hartman, B. (2018). Bayesian Nonparametric Regression Models for Modeling and Predicting Healthcare Claims. *Insurance: Mathematics and Economics*, 83, 1-8.
- Lally, N.\* and Hartman, B. (2018). Estimating Loss Reserves Using Hierarchical Bayesian Gaussian Process Regression with Input Warping. *Insurance: Mathematics and Economics*, 82, 124-140.
- Wanik, D. W.\*, He, J.\*, Anagnostou, E. N., Hartman, B. M. (2018). Estimated Time of Restoration (ETR) Guidance for Electric Distribution Networks. *Journal of Homeland Security and Emergency Management*, 15(1), 1-13.
- Wanik, D. W.\*, Anagnostou, E. N., Astitha, M., Hartman, B. M., Frediani, M. E. B.\*, Lackmann, G. M., He, J.\*, and Yang, J.\* (2018). Evaluation of Power Outages in Connecticut during Future Hurricane Sandy Scenarios. *Journal of Applied Meteorology and Climatology*, 57(1), 51-79.
- He, J.\*, Wanik, D. W.\*, Hartman, B. M., Anagnostou, E. N., Astitha, M., Frediani, M. E. B.\* (2017). Nonparametric Tree-based Predictive Modeling of Storm Damage to Power Distribution Network. *Risk Analysis*, 37(3), 441-458.
- Yang, J.\*, Astitha, M., Anagnostou, E. N., and Hartman, B. M. (2017). Using a Bayesian regression approach on dual-model weather simulations to improve wind speed prediction. *Journal of Applied Meteorology and Climatology*, 56(4), 1155-1174.
- Wanik, D. W.\*, Parent, J. R.\*, Anagnostou, E. N., and Hartman, B. M. (2017). Using Vegetation Management and LiDAR-Derived Tree Height Data to Improve Outage Predictions for Electric Utilities. *Electric Power Systems Research*, 146, 236-245.
- Huang, S.\*, Hartman, B. M., and Brazauskas, V. (2017). Model Selection and Averaging of Health Costs in Episode Treatment Groups. *ASTIN Bulletin*, 47(1), 153-167.
- Lally, N. R.\* and Hartman, B. M. (2016). Predictive Modeling in Long Term Care Insurance. *North American Actuarial Journal*, 20(2), 160-183.
- Shi, P and Hartman, B. M. (2016). Credibility in Loss Reserving. *North American Actuarial Journal*, 20(2), 114-132.
- Wanik, D. W.\*, Anagnostou, E. N., Hartman, B. M., Frediani, M. E. B.\*, and Astitha, M. (2015). Storm Outage Modeling for an Electric Distribution Network in Northeastern USA. *Natural Hazards*, 79(2), 1359-1384.
- Fellingham, G. W., Kottas, A., and Hartman, B. M. (2015). Bayesian Nonparametric Predictive Modeling of Group Health Claims. *Insurance: Mathematics and Economics*, 60, 1-10.
- Hartman, B. M. and Groendyke, C (2013). Model Selection and Averaging in Regime-Switching Models of Various Types. *North American Actuarial Journal*, 17(3), 216-228.
- Hartman, B. M., Talukdar, D., and Mallick, B. (2012). Investigating International New Product Diffusion Speed: A Semiparametric Approach. *Annals of Applied Statistics*, 6(2), 625-651.

- Hartman, B. M. and Heaton, M. (2011). Accounting for Regime and Parameter Uncertainty in Regime-Switching Models. *Insurance: Mathematics and Economics*, 49(3), 429-437.

### Patent

- Anagnostou, E., Wanik, D., Hartman, B., He, J. (2021). Systems and Methods for Outage Prediction, United States Patent 11,144,835.

### Other Publications

- Birdsall, M., Strommen, S., and Hartman, B. Principle-Based Reserves Simplified Methods. (2020). Society of Actuaries Report.
- Auto Loss Costs Trend Analysis. (2018). Casualty Actuarial Society, PCI, and Society of Actuaries Report.
- Hartman, B., Richardson, R., and Bateman, R.\* (2017). Parameter Uncertainty. Casualty Actuarial Society, Canadian Institute of Actuaries, and Society of Actuaries Report.
- Hartman, B. (2016). Learning to Untangle: Training Actuaries to Solve Problems with Data. *The Actuary*. June/July 2016.
- Hartman, B. and Groendyke, C. (2015). James C. Hickman Scholar Program: Building Future Actuarial Educators. *The Actuary*. June/July 2015.
- Hartman, B. M. (2014). Bayesian Computational Methods. In J. Frees, G. Meyers, and R. Derrig (Eds.), *Predictive Modeling Applications in Actuarial Science*. Cambridge University Press.
- Payne, R. D.\*, Hartman, B. M., and Dahl, D. B. (2013). Asset Returns from a Distance-Based Random Partition Model. Technical Report.
- Hartman, B., Talukdar, D., Mallick, B., and Sudhir, K. (2012). Investigating Cross-Country Influence Dynamics in New Product Diffusions. Technical Report.
- Hartman, B. and Dahl, D. (2010). Bayesian Nonparametric Regression for Diabetes Deaths. *Actuarial Research Clearing House*, 2010.1.
- Hartman, B. and Hart, J. (2009). Assessing Model Uncertainty Using Reversible Jump MCMC. *Actuarial Research Clearing House*, 2009.1.

### Grants

- Casualty Actuarial Society (2020), "Ratemaking Exploratory Data Analysis." PI. *Funded*.
- Society of Actuaries Health Care Cost Trends Strategic Research Program (2019), "Modeling the Individual Costs of Kidney Disease." PI. *Funded*.
- Society of Actuaries CAE Grant Competition (2019), "Understanding the Spatial and Temporal Relationships in US Mortality Rates." Co-PI. *Selected, but competition suspended due to COVID-19 pandemic*.
- Casualty Actuarial Society, Property Casualty Insurers Association of America, and Society of Actuaries (2019-2020), "Auto Loss Cost Trends." PI. *Funded*.
- Casualty Actuarial Society (2019), "Anonymizing Private Property/Casualty Ratemaking Datasets using Generative Adversarial Networks." PI. *Funded*.
- NSF (2019), "Statistical Learning of Spatio-temporal Distributions for Disease Surveillance and Epidemiology." Co-PI. *Not funded*.
- Casualty Actuarial Society (2018), "Comparison of Predictive Modeling Approaches in Ratemaking." PI. *Funded*.
- Society of Actuaries (2018), "Variable Selection in Long-term Care Insurance Accounting for Temporal and Parameter Uncertainty." PI. *Not funded*.
- Society of Actuaries (2017-2018), "HCCI Large Claims Forecasting." PI. *Funded*.

- Casualty Actuarial Society, Property Casualty Insurers Association of America, and Society of Actuaries (2017-2018), "Auto Loss Cost Trends." PI. *Funded*.
- Retirement Plans Experience Committee (2017-2018), "Multivariate Analysis For Private Pension Plan Mortality Study and Tables." PI. *Not funded*.
- Society of Actuaries (2017-2018), "Spatial Correlation and Dependence in US Mortality." PI. *Not funded*.
- Society of Actuaries (2016-2018), "Simplified Methodologies For Determining Reserves under VM-20." Co-PI. *Funded*.
- Society of Actuaries (2016-2017), "Properly Accounting for Spatial Dependence in Automobile Insurance Claims." PI. *Not funded*.
- Joint Risk Management Research Committee (2016-2017), "Parameter Uncertainty." PI. *Funded*.
- The Actuarial Foundation (2015-2016), "Bayesian Prior Specification for Multivariate Regime-switching Models." PI. *Not funded*.
- The Actuarial Foundation (2014-2015), "Predictive Modeling in Long-term Care Insurance." PI. *Funded*.
- EPRI (2014), "Importance of Tree-trimming in Power Grid Resiliency." Co-PI. *Funded*.
- United Illuminating (2013-2014), "Toward a Resilient Power Grid." Co-PI. *Funded*.
- CIGNA (2012-2014), "Risk Assessment in Group Health Claims." *Funded*.
- Northeast Utilities (2012-2014), "Predictive Modeling of Storm Damage to Overhead Power Distribution Systems." Co-PI. *Funded*.
- Goldenson Center for Actuarial Research (2012-2013), "Long-term Care Insurance Pricing" and "National Retirement Satisfaction Index." PI. *Funded*.
- The Actuarial Foundation (2011-2012), "Model Selection and Averaging in Regime-switching Models." PI. *Funded*.

### **Invited Presentations**

- University of Wisconsin-Madison, Madison, WI, 2024
- Temple University, Philadelphia, PA, 2024
- Nanyang Technical University, Singapore, Singapore, 2024
- Yonsei University, Seoul, Korea, 2024
- Casualty Actuaries of New England Annual Meeting, Uncasville, CT, 2023
- One World Actuarial Seminars, Remote, 2020
- UCSB InsurTech Summit, Santa Barbara, CA, 2019
- UCSB, Santa Barbara, CA, 2019
- New England Statistical Symposium, Hartford, CT, 2019
- SOA Health Meeting, Austin, TX, 2018 (Presented twice)
- Joint Statistical Meetings, Vancouver, BC, Canada, 2018
- SOA Annual Meeting, Nashville, TN, 2018
- CAS Annual Meeting, Las Vegas, NV, 2018 (Presented twice)
- Salt Lake Actuaries Club, SLC, UT, 2018
- SOA Annual Meeting, Nashville, TN, 2018
- ILTCI Conference, Las Vegas, NV, 2018 (session and day-long workshop)
- Life and Annuity Symposium, Seattle, WA, 2017

- ERM Symposium, New Orleans, LA, 2017
- CAS Spring Meeting, Seattle, WA, 2016
- AIG Science Panel Discussion, New York, NY, 2016
- Ratemaking and Product Management Seminar, Orlando, FL, 2016
- Robert Morris University, Moon Township, PA, 2015
- Ratemaking and Product Management Seminar, Dallas, TX, 2015
- SOA Annual Meeting, Austin, TX, 2015 <sup>1</sup>
- Casualty Actuarial Society Annual Meeting and Centennial Celebration, New York, NY, 2014
- Connecticut College, New London, CT, 2014
- Brigham Young University, Provo, UT, 2014
- Workshop in Insurance Mathematics, Quebec, QC, Canada, 2014
- The Hartford Actuarial Seminar Series, Hartford, CT, 2013
- Montreal Seminar of Actuarial and Financial Mathematics, Montreal, QC, Canada, 2013
- Brigham Young University, Provo, UT, 2013
- Ratemaking and Product Management Seminar, Huntington Beach, CA, 2013
- University of Texas, Austin, TX, 2012
- Valuation Actuary Symposium, Orlando, FL, 2011
- WatRISQ, University of Waterloo, Waterloo, ON, 2011
- University of Connecticut, Storrs, CT, 2011
- University of Wisconsin, Madison, WI, 2011
- University of Waterloo, Waterloo, ON, 2011
- University of Western Ontario, London, ON, 2010
- University of Wisconsin, Madison, WI, 2010
- Brigham Young University, Provo, UT, 2010
- University of Texas at Austin, Austin, TX, 2010
- Butler University, Indianapolis, IN, 2010
- University of Waterloo, Waterloo, ON, 2010

### **Honors and Awards**

- Alvin C. Rencher Faculty Fellowship Award, 2023
- Department Excellence in Teaching Award, 2019
- College Distinguished Teaching Award, 2019
- Ronald Bornhuetter Loss Reserve Prize, 2014
- Member of the Teaching Exemplars Network, only 7 at UConn, 2013-2015
- Actuarial Research Conference, Student Presentation Competition
  - 2010: 1st Place
  - 2009: 3rd Place
  - 2008: 1st Place
- Graduate Teaching Academy Fellow, Texas A&M University, 2009
- ASA StatBowl Champion, JSM, 2009

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<sup>1</sup>One of four sessions streamed online from the conference. About 300 in-person attendees and 700 remote attendees.

- Section on Statistics and Marketing JSM Travel Grant, 2009
- Committee on Knowledge Extension Research ARC Travel Grants, 2008, 2009, & 2010
- Graduate Merit Fellowship, Texas A&M University, 2006-2008
- Statistics Departmental Fellowship, Texas A&M University, 2006-2009
- Heritage Scholarship, Brigham Young University, 2002-2006
- Robert C. Byrd Honors Scholarship, 2002-2006

### **Contributed Presentations**

- Actuarial Research Conference, Des Moines, IA, 2023
- Modeling and Societal Impact of Longevity and Aging Conference, Amsterdam, Netherlands, 2023
- Actuarial Research Conference, Urbana-Champaign, IL, 2022
- Actuarial Research Conference, Remote, 2021
- Brigham Young University, Provo, UT, 2020
- Actuarial Research Conference, Remote, 2020
- Actuarial Research Conference, West Lafayette, IN, 2019
- Actuarial Research Conference, London, ON, Canada, 2018
- Advances in Predictive Analytics, Waterloo, ON, Canada, 2017
- 50th Actuarial Research Conference, Toronto, ON, Canada, 2015
- Actuarial Research Conference, Atlanta, GA, 2017
- Joint Statistical Meetings, Seattle, WA, 2015
- Joint Statistical Meetings, Montreal, QC, Canada, 2013
- 49th Actuarial Research Conference, Santa Barbara, CA, 2014
- 48th Actuarial Research Conference, Philadelphia, PA, 2013
- 47th Actuarial Research Conference, Winnipeg, MB, Canada, 2012
- Statistical Society of Canada Annual Meeting, Guelph, ON, Canada, 2012
- 46th Actuarial Research Conference, Storrs, CT, 2011
- 14th International Congress on Insurance: Mathematics and Economics, Toronto, ON, 2010
- 45th Actuarial Research Conference, Vancouver, BC, Canada, 2010
- Joint Statistical Meetings, Vancouver, BC, Canada, 2010
- Joint Statistical Meetings, Washington, DC, August 2009
- Actuarial Research Conference, Madison, WI, July 2009
- INFORMS Marketing Science Conference, Ann Arbor, MI, June 2009
- 43rd Actuarial Research Conference, Regina, SK, Canada, Aug 2008
- Department of Mathematics, Texas A&M University, Sept 2007
- Department of Statistics, Texas A&M University, Sept 2007
- AP Statistics Classes, Curtis High School, July 2007

### **Memberships**

- Academic Central, Casualty Actuarial Society, 2012 - Present
- Associate, Society of Actuaries, 2008 - Present
- American Statistical Association, 2004 - Present

## Service

- Editorial service
  - Co-editor for North American Actuarial Journal (2022-)
  - Associate Editor for North American Actuarial Journal (2019-2022)
  - Referee for: Annals of Actuarial Science, Asia-Pacific Journal of Risk and Insurance, ASTIN Bulletin, Insurance: Mathematics and Economics, Insurance and Risk Management, Journal of Risk and Insurance, Marketing Science, and North American Actuarial Journal
- Service to the profession as a whole
  - 59th ARC Scientific Committee (2023-2024)
  - Loss Data Analytics Co-editor (2022-)
  - SOA AAM Exam Committee (2022-2023)
  - CAE Evaluation Committee (2019-2022)
  - SOA Health Care Costs Strategic Research Initiative Steering Committee (2018-2021)
  - SOA Actuarial Innovation and Technology Strategic Research Initiative Steering Committee (2018-2019)
  - SOA General Insurance Research Committee (2016-2020)
  - CAS University Engagement Committee (2014-2020)
  - SOA Health Section Research Committee (2016-2019), Vice-chair 2016-2017, Chair 2018-2019
  - Member of the Hickman Scholarship Committee (2014-2016), Chair for 2015 and 2016
  - CAS Exam Committee (2014-2019)
  - Education and Research Section Council Member (2015-2018), Vice-chair for 2016, Chair for 2017
  - MLC Grading Team (2014-2016)
- Graduate advising as chair:
  - Colton Syndergaard, MS Statistics, 2024
  - McKay Gerratt, MS Statistics, 2022
  - Jared Cummings, MS Statistics, 2022
  - Zoe Gibbs, MS Statistics, 2020
  - Micaela Johnson, MS Statistics, 2018
  - Stephen Merrill, MS Statistics, 2017
  - Shujuan Huang, PhD Actuarial Science, 2015
  - Nathan Lally, MS Actuarial Science, 2015
- Graduate advising as associate advisor:
  - Jacob Miller, MS Statistics, 2023
  - Amber Jensen, MS Statistics, 2023
  - McKay Christensen, MS Statistics, 2022
  - Adam Ott, MS Statistics, 2021
  - Celeste Ingersoll, MS Statistics, 2020
  - Dean Sobczak, MS Statistics, 2020
  - Josh Meyers, MS Statistics, 2019
  - Brandon Carter, MS Statistics, 2019

- Jaemo Yang, PhD Environmental Engineering, 2018
- Sierra Pugh, MS Statistics, 2018
- David Arthur, MS Statistics, 2018
- David W. Wanik, PhD Environmental Engineering, 2015
- Wenyuan Zheng, PhD Actuarial Science, 2015
- Unawatuna (Asiri) Gunathilaka, PhD Actuarial Science, 2014
- Priyantha Hewa Katuwandeniya, PhD Actuarial Science, 2014
- Ushani Kariyawasam Majuwana Gamage, PhD Actuarial Science, 2014
- Milanthi Sarukkali, PhD Actuarial Science, 2013
- Senior/Honors Thesis
  - 2020: Jason Colgrove
  - 2018: Kaylee Dudley
  - 2014: Nathan Lally, Anthony Renzullo
  - 2013: Michael Tarpey, Michael Byram, Kimberly Panther
- Committee Service at BYU
  - Stat Club Advisor (2023-)
  - Alumni and Employer Relations (2023-)
  - TA Committee (2019)
  - Staff Hiring Committee (2019)
  - AVPs Economics Move Task Force (2019)
- Committee Service at the University of Connecticut
  - UConn Actuarial Seminar Series Organizer (2012-14)
  - Party Committee (2012-2015)
  - Web Committee (2013-2015)
  - Various Scholarship Committees (2013-2014)
  - Post-doc Hiring Committee (2014)
  - Undergraduate Program Committee (2012-2013)
  - Visiting Assistant Professor Hiring Committee (2012)
  - Actuarial Science Committee (2011-2015)
- Vice President, Statistics Graduate Student Association, Texas A&M University, 2008-2010
- Coach and Captain, BYU Ultimate Team, Summer 2005 to Summer 2006