Wenjun Zhu

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Wenjun Zhu (PhD, FSA, CERA), is a tenured Associate Professor in the Division of Banking & Finance at Nanyang Business School, NTU Singapore, where she also serves as Deputy Head of Division and Co-Director of the Insurance Risk and Finance Research Centre (IRFRC). Her research spans mortality and longevity risk, climate and health risk modeling, and AI-driven financial innovation, with publications in leading actuarial and finance journals. Working closely with industry, professional bodies, and governments, her research aims to revolutionize insurance practice by developing state-of-the-art tools for more efficient risk management. A recipient of multiple awards (including the SOA Hickman Scholar and the 2023 Actuarial Science Early Career Award), Professor Zhu also contributes to global policy as an invited IPCC expert and Lead Author for the IPCC AR7 report.

PERSONAL INFORMATION

Highest Degree: PhD (2015), University of Waterloo

Professional Designation:

Fellow of the Society of Actuaries (FSA), 2019

Charted Enterprise Risk Analyst (CERA), 2019

EDUCATION

Ph.D., University of Waterloo 2011 - 2015

Dissertation: "Actuarial Ratemaking in Agricultural Insurance"

Supervisors: Professors Ken Seng Tan and Lysa Porth

Committee: Professors Mary Hardy, Adam Kolkiewicz, Jason Thistlethwaite, and Calum Turvey

Bachelor (with honor), Nankai University 2007 - 2011

Bachelor of Economics, School of Economics.

Bachelor of Science, School of Mathematical Science.

ACADEMIC APPOINTMENTS

Nanyang Technological University, Singapore

Co-Director, Insurance Risk and Finance Research Centre (IRFRC) 2026 - present

Deputy Head, Division of Banking & Finance 2024 - present

Deputy Director, Insurance Risk and Finance Research Centre (IRFRC) 2024 - 2026

Associate Professor (with tenure)

Division of Banking & Finance, Nanyang Business School 2024 - present

Assistant Professor

Division of Banking & Finance, Nanyang Business School 2017 - 2024

Nankai University, China

Assistant Professor, School of Finance August 2015 - July 2017

University of Waterloo, Cananda

Instructor (Part Time), Department of Statistics and Actuarial Science Spring 2015

VISITING POSITIONS

Cornell University, United States

Visiting Professor, College of Business Aug. - Sep., 2016

RESEARCH

RESEARCH INTEREST

Currently I am particularly interested in the following topics: (1) Climate change risk management; (2) Aging, health and longevity risk management; (3) AI-driven financial innovation.

HONORS, AWARDS

[1] Nominee for Nanyang Research Award (Young Investigator), Nanyang Technological University 2026

[2] Nominee for Research Excellence Award (REA) of Nanyang Business School 2026

[3] Society of Actuaries Early Career Award[1] 2023

[4] Nominee for NBS Accountancy and Business Teacher of the Year Award 2021

[5] NBS Teaching Excellence Award (TEA) 2020

[6] Nominee for the Msc Financial Engineering Teacher of the Year Award 2020

[7] James C. Hickman Scholar, Society of Actuaries 2014 - 2015

[8] University of Waterloo Graduate Scholarship (UWGS) 2014 - 2015

[9] UW Senate Scholarship, University of Waterloo 2014

[10] Cotton Family Women in Math Graduate Scholarship, Faculty of Mathematics 2014

[11] Statistics & Actuarial Science Chair's Award (Three times) 2012 - 2014

[12] MATH Senate Graduate Scholarship, Faculty of Mathematics 2013 - 2014

[13] Meloche Monnex Graduate Scholarship in Quantitative Finance and Insurance 2014

[14] Institute for Quantitative Finance and Insurance Scholarship 2013

[15] James C. Hickman Scholar, Society of Actuaries 2013 - 2014

[16] University of Waterloo Graduate Scholarship 2013 - 2014

[17] Graduate Research Studentship, D. of Statistics and Actuarial Science 2012 - 2015

[18] Mathematics Graduate Experience Award, Faculty of Mathematics 2011 - 2015

[19] International Doctoral Student Award, University of Waterloo 2011 - 2015

[20] Dominion of Canada General Insurance Company Graduate Scholarship in Actuarial Science 2012

[21] MATH Senate Graduate Scholarship, Faculty of Mathematics 2011 - 2012

[22] National Encouragement Excellent Student Scholarship (Twice) 2008 - 2010

[23] First prize as an excellent project in the "100 Project" of Creative Undergraduate Research of Nankai University 2010

[24] Triple-A Outstanding Student in Nankai University (Twice) 2009 - 2011

[25] First Prize of Excellent Undergraduate Scholarship 2007 - 2008

[26] First Prize in Mathematics Competition for University Students in Tianjin 2008

[27] Model Student of Anhui Province, China. 2006

[1] The award that annually recognizes one young researcher worldwide, in recognition of their exceptional research and potential as future academic leaders in the discipline of actuarial science (More Information).

GRANTS

- 2026 - 2029 SGD $101,830.00 Ministry of Education (MOE) Tier 1 Grant
  PI.
  Project title: *Climate-Aware Life Markets: AI-Driven Mortality Modeling and Risk Transfer Innovation*

- 2025 - 2027 SGD ∼$1.5 million CyberSG R&D Programme Office
  Co-PI (PI: Xiaofei Xie)
  From Risk Identification to Risk Management: A Systematic Approach to Mitigating LLM Supply Chain Risks

- 2024 - 2025 USD$46,000 Society of Actuaries Research Institute
  PI (Co-PI: Tianxiang Shi, Yanbin Xu)
  Climate Anomalies and Their Enduring Impacts on U.S. Mortality and Health Landscape

- 2023 - 2030 SGD ∼$45.9 million Ministry of Education (MOE) Tier 3 Grant
  Project PI.
  Allocation to Project PI: ∼$1million.
  Project title: *Climate Transformation Program.*

- 2022 - 2023 USD$ 18,000 Casualty Actuarial Society CKER Individual Grant
  PI.
  Project title: *A Dynamic Updating Framework for Composite Models.*

- 2020 - 2023 SGD$ 84,385.32 Ministry of Education (MOE) Tier 1 Grant
  PI.
  Project title: *Artificial Intelligence, Population Aging, and Capital Market Solutions.*

- 2020 - 2023 USD$ 7,500 Society of Actuaries Educational Institution Grant
  PI.

- 2017 - 2020 SGD$ 100,000 Nanyang Technological University Startup Grant
  PI.

- 2018 - 2021 USD$ 5,000 Society of Actuaries Educational Institution Grant
  PI.

- 2018 - 2019 USD$ 69,500 Society of Actuaries Research Grant
  Co-PI. (PI: Ken Seng Tan)
  Supported paper: *Predictive Analysis: An Application to Agricultural.*

- 2018 - 2019 USD$ 17,500 Society of Actuaries 2018 Individual Grant
  Co-PI. (PI: Yang Lu)
  Supported paper: *Dynamic Bayesian Ratemaking: A Markov Chain Approximation Approach.*

- 2015 - 2016 USD$ 50,000 Society of Actuaries Research Grant
  Co-PI. (PI: Ken Seng Tan)
  Supported paper: *A Relational Data-Matching Model for Enhancing Individual Loss Experience: An Example from Crop Insurance.*

- 2015 - 2017 RMB 90,000 Nankai University Startup Fund
  PI.

RESEARCH PAPERS

Refereed Publications

[1] Qiao, Y., Zhang, J., Zhu, W., Wang, C.-W. (2026). Quantile-based Interpretable Neural Network Models: Mortality Forecasting and Actuarial Simulations. *Insurance: Mathematics and Economics*, forthcoming.

[2] Xu, Y., W. Zhu, D. Samanta, B. Horton (2026), Enduring impacts of El Niño on life expectancy in past and future climates, *Nature Climate Change*, forthcoming

[3] Gu Y., Fang T., Xu Y., Duan X., Lee S. H. J. T., Zhu W., Zeng Y., Yim S. H. L. (2026). Air quality, health, and economic impacts of land-use and land cover changes in Southeast Asia in the twenty-first century: A modelling study. *Lancet Planetary Health*, forthcoming.

[4] Wu, Y., A. Chen, Y. Xu, G. Pan, W. Zhu (2024). Modeling mortality with kernel principal component analysis (KPCA) method, *Annals of Actuarial Science*, 18(3):626-643.

[5] Huang, S., Tan, K. S., Zhang, J. and Zhu, W. (2024). Epidemic Financing Facilities: Pandemic Bonds and Endemic Swaps, *North American Actuarial Journal*, 28(3):626-657.

[6] Chen, Z., Lu, Y., Zhang, J., and Zhu, W. (2024). Managing Weather Risk with a Neural Network-Based Index Insurance. *Management Science*, 70(7):4306-4327.

[7] Li, Y., Gao, J., and Zhu, W. (2024). Digital Financial Inclusion and Tourism Demand: A Spatial Spillover Perspective. *Tourism Economics*, 30(7):1680 - 1703.

[8] Qiao, Y., Wang, C., and Zhu, W. (2024). Machine Learning in Long-term Mortality Forecasting. *The Geneva Papers on Risk and Insurance - Issues and Practice*, 49:340-362.

[9] Lu, Y., Zhang, J., and Zhu, W. (2024). Cyber Risk Modeling: A Discrete Multivariate Count Process Approach, *Scandinavian Actuarial Journal*, 2024(6), 625-655.

[10] Huang, S., J. Zhang and W. Zhu (2023). Storm CAT Bond: Modeling and Valuation. *North American Actuarial Journal*, forthcoming.

[11] Zhu, W. (2023). A Deep Factor Model for Crop Yield Forecasting and Insurance Ratemaking. *North American Actuarial Journal*, 28(1), 57-72..

[12] Wang, C.-W., Zhang, J., and Zhu, W. (2021). Neighbouring Prediction for Mortality. *ASTIN Bulletin, the Journal of the IAA*, 51(3), 689-718.

[13] Li, H., Tan, K.S., Tuljapurkar S., and Zhu, W. (2021). Gompertz Law Revisited: Forecasting Mortality with a Multi-factor Exponential Model. *Insurance: Mathematics, and Economics*, 99, 268-281.

[14] Li, H., Porth, L., Tan, K.S., and Zhu, W. (2021). Improved Index Insurance Design and Yield Estimation using a Dynamic Factor Forecasting Approach. *Insurance: Mathematics, and Economics*, 96, 208-221.

[15] Li, H., Lu, Y., and Zhu, W. (2021). Dynamic Bayesian Ratemaking: A Markov Chain Approximation Approach. *North American Actuarial Journal*, 25(2), 186-205.

[16] Porth, C.B., Porth, L., Zhu, W., Boyd, M., Tan, K.S., Liu, K. (2020). Remote Sensing Applications for Insurance: An Example of Predicting Forage Crop Loss in the Presence of Systemic Weather Risk. *North American Actuarial Journal*, 24(2), 333-354.

[17] Boyd, M., Porth, C.B., Porth, L., Tan, K.S., Wang, S., and Zhu, W. (2019), The Design of Weather Index Insurance Using Principal Component Regression and Partial Lease Squares Regression: The Case of Forage Crops. *North American Actuarial Journal*, 24(3), 344-369.

[18] Zhu, W., Tan, K.S., and Porth, L. (2019). Agricultural Insurance Ratemaking: Development of a New Premium Principle. *North American Actuarial Journal*, 23(4), 512-534.

[19] Zhu, W., Porth, L., and Tan, K.S. (2019). A Credibility-based Yield Forecasting Model for Crop Reinsurance Pricing and Weather Risk Management. *Agricultural Finance Review*, 79(1), 2-26.

[20] Porth, L, Tan, K.S., and Zhu, W. (2019). A Relational Data-Matching Model for Enhancing Individual Loss Experience: An Example from Crop Insurance. *North American Actuarial Journal*, 23(4), 551-572.

[21] Zhu, W., Tan, Porth, L., K.S., Wang, C.-W. (2018). Spatial Dependence and Aggregation in Hedging Systemic Weather Risk: A Lévy Subordinated Hierarchical Archimedean Copulas (LSHAC) Approach. *ASTIN Bulletin, the Journal of the IAA*, 48 (2), 779-815.

[22] Zhu, W., Tan, K.S., Wang, C.-W. (2017). Modeling Multi-population Longevity Risk with Mortality Dependence: A Lévy Subordinated Hierarchical Archimedean Copulas (LSHAC) Approach. *Journal of Risk and Insurance*, 84, 477-493.

[23] Zhu, W., Wang, C.-W., and Tan, K.S. (2016). Structure and Estimation of Lévy Subordinated Hierarchical Archimedean Copulas (LSHAC): Theory and Empirical Tests, *Journal of Banking & Finance*, 69, 20-36.

[24] Porth, L., Zhu, W., and Tan, K.S. (2014). A credibility-based Erlang mixture model for pricing crop reinsurance, *Agricultural Finance Review*, 74(2), 162-187.

Selected Working Papers

[25] Life Expectancy and Corporate Debt Markets (with Chen, Z., Goyal, V. K. and Lou, P.), 2024. Working Paper.

- Santiago Finance Workshop (SWF) 2021; INQUIRE 2021; AMES 2022; CICF 2022; EFA 2022; Longevity 2025
- SSRN's Top Ten download list for: Property, Casualty & Life Insurance eJournal

[26] Robust Testing in High-Dimensional Linear Model (with Pan, G., Feng, Qu., Jaidee, S.), 2022. Under review, *Journal of Business and Economic Statistics*.

[27] Sustainable Area-Yield Insurance Program with Optimal Risk Pooling: A Behavior-Based Machine Learning Approach (with Xu, Y., Tan, K. S. and Pan, G), 2024. Under Review, *Journal of American Statistics Association*.

- IME 2021; CICIRM 2021

[28] A Geo-Hierarchical Deep Learning Model for Flood Risk Modeling and Pricing (with Xu, Y. and Tan, K. S.), 2024. Working paper.

- IME 2023; ARC 2023; JARIP 2023

[29] A Dynamic Updating Framework for Composite Models (with Xu, Y. and Tan, K. S.), 2024. Working Paper.

[30] Moral Hazard in Index Insurance (with Chen, Z., Zhang, J., Zhang, Y., and Zhu, X.). Working Paper.

[31] Pricing Catastrophe Bond in the Primary Market: The Role of Climate News Sentiment (with Chen, Z. and Qian, C.), 2024, Working Paper.

[32] Arbitrage-Free Pricing of Reverse Mortgage using Neural Stochastic Differential Equations (with Bai, D., Wang, C., and Zhang, J.), 2025, Working paper.

- Longevity 2025

[33] Social Media-Enhanced Earthquake Loss Assessment and Catastrophe Parametric Insurance Design (with Bai, D. and Chen, X.), 2024. Working Paper.

[34] Bai, D., Wüthrich, M., Zhang, J., and Zhu, W. (2025). A Transformer-based Approach to Weather Index Insurance Design, Working paper.

- ARC 2025

[35] Resilience through responsibility: The impact of ESG status on firm resilience to climate-induced disruptions. (with Chen, T., Tan, K. S., and Xu, Y.), 2024. Working Paper.

[36] Gu, Y., Fang, T., Xu, Y., Duan, X., Lee, J., Zhu, W., Zeng, Y., Yim, S. (2025). Air quality, health, and economic impacts of land use and land cover changes in Southeast Asia since the twenty-first century. Working paper.

[37] Xu, Y., Shi, T., Zhu, W., Samanta, D., and Horton, B. P. (2025). Climate anomalies' enduring impacts on U.S. health landscape. Working paper.

[38] Xu, Y., Kamiya, S., Porth, L., and Zhu, W. (2025). Bridging the protection gap: A tax redistribution solution under a private-public partnership framework. Working paper.

- IME 2024

[39] Xu, Y., Shaw, T. A., Lakshani, Switzer, A., Zhu, W., and Kamiya, S. (2025). Changes in cyclone- prone conditions in East and Southeast Asia under climate change. Working paper.

[40] Xu, Y., Zhu, W., and Kamiya, S. (2025). Geo-hierarchical deep learning for inland flood hazard modelling in Southeast Asia under current and future climates. Working paper.

[41] Optimal Crop Yield Insurance (with F. Liu), 2023. Working in progress.

[42] Duration-Hedging Trades, Return Momentum and Reversal (with Chen, Z. and Lou, P.), 2022. Working Paper.

- IME 2021; AMES 2023

Books/Book Chapters

[43] Zhu, W., Zhang, J., Porth, L., and K. S. Tan (2024). Index-based Insurance Design: A Review, forthcoming in Springer Actuarial, *Quantitative Risk Management and Insurance in Agricultural Business*, edited by A. Hirbod and S. Wang.

Technical Reports & Other Publications

[44] Timothy A. Shaw, Erandani Lakshani, Adam D. Switzer, Yanbin Xu, Shinichi Kamiya, Wenjun Zhu, 2026. Cyclones in the Asia Pacific: A View to Future Risks. Global Asia Insurance Partnership (GAIP) Living Lab Report. June 2026. Link to the report.

[45] C. K. Liang, Zhu, W., S. Kamiya, C. Nie, Mar 2026. Climate-Adjusted Mortality Modelling in Asia. Global Asia Insurance Partnership (GAIP) Living Lab Report. March 2026. Link to the report.

[46] Xu, Y., Zhu, W., and Shi, T., December 2025. Climate Anomalies' Enduring Impacts on U.S. Mortality and Health Landscape. Society of Actuaries Research Institute. Link to the report.

[47] Yanbin Xu, Wenjun Zhu, and Shinichi Kamiya, 2025. Inland Flood Risk Modeling in Southeast Asia. Global Asia Insurance Partnership (GAIP) Living Lab Report. May 2025. .

[48] Xu, Y., Horton, B. P., and Zhu, W., 2025. The Economics of El Niño: A look at climate challenges in Southeast Asia, The Actuary Magazine. Link to the article.

[49] Shaow, T., Switzer, A. D., Kamiya, S., Zhu, W., and Xu, Y., 2024. Sea level rise: Importance to the insurance sector. Link to the report.

[50] Xu, Y., Horton, B. P., and Zhu, W., 2023. Record-breaking El Nino could hurt South-east Asia's growth, *Business Times*, 22 Sep 2023, Page 16. Link to the article.

[51] Zhu, W. Tan, K.S., and Porth, L., 2021. Reply to Hans U. Gerber and Elias SW Shiu on Their Discussion on Our Paper Entitled "Agricultural Insurance Ratemaking: Development of a New Premium Principle." North American Actuarial Journal 25 (3), 466-467.

[52] Zhu, W. Tan, K.S., and Porth, L., 2021. Reply to Abylay Zhexembay on the Discussion on Our Paper Entitled "Agricultural Insurance Ratemaking: Development of a New Premium Principle." North American Actuarial Journal 25 (3), 472-472.

[53] Porth, L., M. Roznik, K.S. Tan, W. Zhu, and C. B. Porth. Predictive Analysis: The Effects of Technology and Weather on Crop Yield. Society of Actuaries Research Report, December, 2019. Link to the report.

[54] Porth, C. B., Porth, L., Boyd, M., Tan, K. S., and Zhu, W., 2018. Assessing the Feasibility and Development of a Forage Insurance Plan using Satellite-Derived Biophysical Parameters with a Focus on the Province of Alberta, Canada.

[55] Porth, C. B., Porth, L., Boyd, M., Tan, K. S., and Zhu, W., 2018. Assessing the Feasibility and Development of a Forage Insurance Plan using Satellite-Derived Biophysical Parameters with a Focus on the Province of Saskatchewan, Canada.

[56] Porth, L., K. S. Tan, and W. Zhu. Farm-Level Crop Yield Forecasting in the Absence of Farm-Level Data. Society of Actuaries Research Report, October, 2016, Link to the report.

CONFERENCE, SEMINAR PRESENTATIONS

Keynote Presentations

[1] 2027 ASTIN Bulletin Conference, University of Naples Parthenope, Italy, from 20 – 22 January 2027. (Scheduled)

[2] Dynamics of Risk Landscape-Increasing importance of insurance Workshop. Singapore, 15 August, 2025.

[3] Common Prosperity Workshop, Innovation Centre of Yangtze River Delta, Zhejiang University, June 26, 2024.

Invited Presentations

[4] Korea Insurance Research Institute (KIRI) Invited Seminar, 24 October, 2025, "Advancing Index-Based Risk Solutions: Actuarial Models, Machine Learning, and Empirical Evidence."

[5] Singapore Actuarial Conference, Singapore, 27 August, 2025, "Advancing Index-Based Risk Solutions: Actuarial Models, Machine Learning, and Empirical Evidence."

[6] CCRS Seminar, Centre for Climate Research Singapore (CCRS), Singapore, April 29, 2025, "Index-based Insurance Design for Weather Risk Management."

[7] The University of New South Wales, Sydney, Australia, 28 May, 2025, "Advancing Index-Based Risk Solutions: Actuarial Models, Machine Learning, and Empirical Evidence."

[8] CCRS Seminar, Centre for Climate Research Singapore (CCRS), Singapore, April 29, 2025, "Index-based Insurance Design for Weather Risk Management."

[9] University of Melbourne, Australia, August 7 2024, "Life Expectancy at Risk: The Enduring Impact of El Niño on Human Mortality".

[10] SCOR Deep Talk Workshop, 30 November, 2023, "Index-insurance Design with Machine Learning."

[11] 21st Japanese Association of Risk, Insurance and Pensions (JARIP), Kawasaki, Japan, November 25, 2023,"Borrowing Information Across Space and Time: Pricing Flood Risk with Physics-based Hierarchical Deep Learning Models."

[12] International Conference on Actuarial Science, Quantitative Finance, and Risk Management, July 9-11, 2023, Beijing, China. "Machine Learning in Long-term Mortality Forecasting."

[13] "Climate Risk Management and Analytics" Workshop, Imperial College London, UK, July 3, 2023.

[14] SunYat-Sen University, Guangzhou, China (Virtual), June 10, 2022, "Managing Weather Risk with an Neural Network-Based Index Insurance."

[15] NBS-AI.R Joint Symposium: Empower Financial Services with Artifical Intelligence. March 1, 2022. "Managing Weather Risk with an Neural Network-Based Index Insurance."

[16] One World Actuarial Research Seminar (OWARS) (Virtual), October 27. 2021. "Duration-Hedging Trades, Return Momentum and Reversal."

[17] UNSW BUS Risk & Actuarial Science Seminar, Sydney (Virtual), July 31, 2020, "Neural Network-based Design of Index Insurance".

[18] College of Management, National Sun Yat-Sen University, Kaohsiung, August 28, 2019, "On a Class of Premium Calculation Principles Based on the Multivariate Weighted Distribution: Theory and Application".

[19] China Institute for Actuarial Science, Central University of Finance and Economics (CUFE), Beijing, June 23, 2017, "Securitization in the Presence of Systemic Risk and Catastrophic Events".

[20] University of Science and Technology of China (USTC), March 3, 2017, "High Dimensional Modeling with Lévy Subordinated Hierarchical Archimedean Copulas (LSHAC): Theory and Application".

[21] Nanyang Business School, Nanyang Technological University, Singapore, February 21, 2017, "High Dimensional Modeling with Lévy Subordinated Hierarchical Archimedean Copulas (LSHAC): Theory and Application".

[22] Department of Mathematics, Illinois State University, Normal, IL, U.S.A., January 25, 2017, "On a Class of Premium Calculation Principles Based on the Multivariate Weighted Distribution: Theory and Application".

[23] International Symposium on Financial Engineering and Risk Management (FERM), June 12 - 13, 2016, "Spatial Dependence and Aggregation in Hedging Systemic Weather Risk".

[24] School of Public Management, Zhejiang University, Zhejiang, China, April 19, 2016, "Premium Principles and Agricultural Insurance Ratemaking".

[25] School of Mathematical Science, Zhejiang University, Zhejiang, China, April 20, 2016, "Spatial Dependence and Aggregation in Hedging Systemic Weather Risk".

[26] Chongqing University, Chongqing, China, January 4, 2016, "Spatial Dependence & Aggregation in Weather Risk Hedging: A Lévy Subordinated Hierarchical Archimedean Copulas (LSHAC) Approach".

[27] Lingnan Financial Seminar, SunYat-Sen University, Guangzhou, China, November 27, 2015, "Structure and Estimation of Lévy Subordinated Hierarchical Archimedean Copulas (LSHAC): Theory and Empirical Applications"

[28] University of Illinois at Urbana-Champaign, IL, U.S.A, October 15, 2015, "Structure and Estimation of Lévy Subordinated Hierarchical Archimedean Copulas (LSHAC): Theory and Empirical Applications"

[29] College of Business, St. John's University, NY, U.S.A, February 6, 2015, "Spatial Dependence & Aggregation in Weather Risk Hedging: A Lévy Subordinated Hierarchical Archimedean Copulas (LSHAC) Approach".

[30] Department of Mathematics, St. Thoma's University, MN, U.S.A, December 8, 2014,, "Structure and Estimation of Lévy Subordinated Hierarchical Archimedean Copulas (LSHAC): Theory and Empirical Applications".

[31] Graduate Seminar Series (GSS), Department of Statistics and Actuarial Science, University of Waterloo, February 26, 2014, "Actuarial Ratemaking in Agricultural Insurance".

[32] Lingnan Financial Seminar, SunYat-Sen University, Guangzhou, China, January 10, 2014, "Assessing the Impact of Climate Change in Agriculture under an Enterprise Risk Management (ERM) Framework: A New Crop Yield Forecasting and Crop Reinsurance Pricing Model",

[33] Warren Centre for Actuarial Studies and Research, Asper School of Business, University of Manitoba, September 29, 2013, "Improving Crop Yields Forecasting and Crop Reinsurance Pricing Using Weather Data: A Comprehensive Approach Combining Credibility Model and Screening Principal Component Analysis".

Contributed Presentations

[34] 19th Longevity Risk and Capital Markets Solutions Conference, Amsterdam, Netherlands, September 16-17, 2024 (Scheduled), "Life Expectancy at Risk: The Enduring Impact of El Niño on Human Mortality".

[35] 27th International Congress on Insurance: Mathematics and Economics (IME), Chicago, USA, July 8-11, 2024, "Life Expectancy at Risk: The Enduring Impact of El Niño on Human Mortality"

[36] NBS Research Day, 22 September 2023, NTU, Singapore, "Sustainable Area-Yield Insurance Program with Optimal Risk Pooling: A Behavior-Based Machine Learning Approach."

[37] 58th Actuarial Research Conference (ARC) Des Moines, Iowa, USA, July 30-Augst 2, 2023, "Machine Learning in Long-term Mortality Forecasting."

[38] 26th International Congress on Insurance: Mathematics and Economics (IME), July 4-7, 2023, Edinburgh, UK, "Machine Learning in Long-term Mortality Forecasting."

[39] 49th Annual Meeting of the European Finance Association (EFA), August 24-27, 2022, Barcelona, Spain, "Life Expectancy and Corporate Debt Markets."

[40] 2022 Asian Meeting of the Econometric Society (AMES) (Virtual), Shenzhen, China, June 22 – 24, 2022, "Life Expectancy and Corporate Debt Markets."

[41] 24nd International Congress on Insurance: Mathematics and Economics, July 5-9 2021, Virtual, "Duration-Hedging Trades, Return Momentum and Reversal ".

[42] World Risk and Insurance Economics Congress (WRIEC), August 3-7, 2020, Virtual, "Neural Network-based Design of Index Insurance".

[43] 22nd International Congress on Insurance: Mathematics and Economics UNSW Sydney, 15 - 18 July 2018, "Modeling High Dimensional Systemic Risk".

[44] Advances in Predictive Analysis Conference (APA), December 1-2, Waterloo, Canada, "Factor Forecasting for Agricultural Production Processes".

[45] The 5th Annual Meeting for the International Agricultural Risk, Finance and Insurance Conference (IARFIC), June 7-9, Paris, France, "Systemic Risk and Agricultural Insurance Pricing".

[46] Twelfth International Longevity Risk and Capital Markets Solutions Conference, September 29 - 30, 2016, Chicago, U.S.A., "Longevity Discrepancy Swap".

[47] 2016 Agricultural & Applied Economics Association (AAEA) Annual Meeting, July 31- August 2, 2016, Boston, U.S.A., "Relational Model for Farm-Level Crop Yield Forecasting: When Data are Unavailable".

[48] 51st Actuarial Research Conference (ARC), July 27 - August 2, 2016, Minnesota, U.S.A., "On a Class of Premium Calculation Principles Based on the Multivariate Weighted Distribution".

[49] 20th International Congress on Insurance: Mathematics and Economics, July 24 - 27, 2016, Atlanta, G.A., U.S.A., "On a Class of Premium Calculation Principles Based on the Multivariate Weighted Distribution"

[50] Actuarial Research Conference 2015 Annual Meeting (ARC), University of Toronto, Toronto, Ontario, Canada, August 5 - 8, 2015. "Spatial Dependence and Aggregation in Hedging Systemic Weather Risk: A Lévy Subordinated Hierarchical Archimedean Copulas (LSHAC) Approach".

[51] The Forth International Agricultural Risk, Finance, and Insurance Conference (IARFIC), Washington D. C., U.S., June 7 - 9, 2015, "Premium Principles and Agricultural Insurance Ratemaking".

[52] WatRISQ Graduate Student Presentation Day, November 24, 2014, "Structure and Estimation of Lévy Subordinated Hierarchical Archimedean Copulas (LSHAC): Theory and Empirical Tests".

[53] The Third International Agricultural Risk, Finance, and Insurance Conference (IARFIC), Zurich, Switzerland, June 21 - 24, 2014, "Lévy Subordinated Hierarchical Archimedean Copula Approach to Modeling Weather Risk and Pricing Agricultural Insurance".

[54] International Workshop on High-Dimensional Dependence and Copulas: Theory, Modeling, and Applications, Beijing, China, January 3 - 5, 2014, "Lévy Subordinated Hierarchical Archimedean Copulas: Theory and Application".

[55] WatRISQ Graduate Student Presentation Day, September 30, 2013, "Crop Yields Forecasting and Crop Reinsurance Pricing Using Weather Data".

[56] The Second International Agricultural Risk, Finance, and Insurance Conference (IARFIC), Vancouver, Canada, June 16 - 18, 2013, "Improving Crop Yields Forecasting Using Weather Data: A Comprehensive Approach Combining Principal Component Analysis and Credibility Model".

[57] Actuarial Research Conference 2012 Annual Meeting (ARC), University of Manitoba, Winnipeg, Manitoba, Canada, August 1 - 4, 2012. "An Actuarial Framework for Modeling Loss Cost Ratio's in Crop Insurance: Trend Testing, Data Detrending, and Pricing, Using an Erlang Mixture Distribution".

[58] International Agricultural Risk, Finance, and Insurance Conference (IARFIC), Central University of Finance and Economics, Beijing, China, June 20 - 21, 2012, "An Actuarial Framework for Modeling Loss Cost Ratio's in Crop Insurance: Trend Testing, Data Detrending, and Pricing, Using an Erlang Mixture Distribution".

STUDENT SUPERVISION

Research Fellows/Research Associates

[1] Sombut Jaidee (Research Fellow), 2022 - 2023.

[2] Zhengyang Liu (Research Associate), May 2024 - Nov 2025.

[3] Shuli Geng (Research Fellow), 2025 - .

PhD Students

[1] Yanbin Xu, 2020 - 2024.

Thesis title: Climate Change and Sustainability: An Actuarial Risk Management Perspective.

- First runner-up of 2024 SCOR Actuarial Research Award in APAC

First Position: Research Assistant Professor, Nanyang Technological University

[2] Deyu Bai, 2024 - present.

Tentative Thesis title: Artificial Intelligence in Actuarial Risk Management.

Master Students

[1] Nuo Zhang, Fall 2015 - Spring 2017 (Nankai University). Thesis Title: Asymmetric Dependence Modeling of the Chinese Stock Market. (*First Position: Bank of Communications Headquarters, Shanghai, China.*)

Undergraduate Students

[1] URECA projects (AY2023): Yeo Zhan Xiong, Chee Keen Liang, Jiaqian Li, etc.

[2] Chin, Yong Herng Alvin, Chua, Zhong Zhi, Ho, Kai Heng Thomas, Tan, Bing Hao Edgar. Case Study "NEW·WORLD Parametric Insurance".
- First runner-up of 2021 Society of Actuaries Student Research Case Study Challenge

[3] Yuanqi Wu. Final Year Project (FYP) 2020-2021.

Essay title: Some Statistical Properties of the Lee-Carter Model.

[4] Yanbin Xu. Final Year Project (FYP) 2018-2019.
Essay title: Machine Learning And Its Application In Pricing Agricultural Area-Yield Insurance.

[5] Shimeng Huang. 2019-2020.
Research project: Storm CATBond: Modeling and Pricing.

[6] Yuan Yang, Yong Jia Glenn, Ri Bing Jeremy Lim, and Yanbin Xu. Case Study "Bellagos LTC Social Insurance System".
- First runner-up of 2018 Society of Actuaries Student Research Case Study Challenge

PROFESSIONAL SERVICES

EDITORIAL SERVICE

- Guest Editor, Journal of Risk and Insurance, Special Issue on "Longevity Risk and Capital Markets Solutions" 2025 - present
- Guest Editor, Annal of Actuarial Science, Special Issue on "Mitigating emerging and large-scale risks" 2025 - present
- Associate Editor, Annals of Actuarial Science (AAS) 2024 -
- Associate Editor, South Africa Actuarial Journal (SAAJ) 2026 -
- Editorial Board, Risks (in financial modeling, actuarial science, and quantitative risk management) 2026 -
- Editorial Board, Sustainable Agriculture and Environment 2024 -
- Guest Editor, Journal of Risk and Financial Management 2022-2023

REFEREE FOR

Insurance: Mathematics and Economics · North American Actuarial Journal · Journal of Risk and Insurance · ASTIN Bulletin · European Actuarial Journal · Agricultural Finance Review · Risks · Climate Risk Management · Variance · Sustainability · Journal of Data Science · Pacific-Basin Finance Journal · Studies in Nonlinear Dynamics & Econometrics

CONFERENCE ORGANIZATION

[1] Conference Chair, Risk Sciences Annual Conference 2025, September 10, 2025, Singapore.

[2] Conference Chair, 20th International Longevity Risk and Capital Markets Solutions Conference (L20), September 8-9, 2025, Singapore.

[3] Organization Chair, Forum of "Frontiers in Life and Health Insurance: Technology, Risks, and Global Markets", 10 Jan 2025.

[4] Conference Co-Chair, International Conference of Insurance and Actuarial Science (ICIA) 2024, Nankai-Taikang College Insurance and Actuarial Science, June 14-16, 2024, Tianjin, China.

[5] Conference Co-Chair, International Conference on Actuarial Science, Quantitative Finance, and Risk Management, July 9-11, 2023, Beijing, China.

[6] Conference Organizing & Scientific Committee for the Asia-Pacific Risk and Insurance Association (APRIA) and Nanyang Technological University's Insurance Risk and Finance Research Centre (IRFRC) Joint Conference, July 29 - August 1, 2018, Singapore.

[7] Conference Organizing & Scientific Committee for the 5th Annual Meeting for the International Agricultural Risk, Finance and Insurance Conference (IARFIC), June 7-9, 2017, Paris, France.

OTHER SERVICES FOR THE ACTUARIAL PROFESSION

[1] Risk Sciences Youth Committee 2024 - Present

[2] AI Education Work-stream, International Actuarial Association (IAA) 2024 - Present

[3] Member of the Society of Actuaries (SOA) Asia Research Committee 2023 - Present

[4] Society of Actuaries (SOA) CAE Evaluation Committee (CEC) Site Visit Panelist 2022 - Present

UNIVERSITY SERVICES

[1] Senator, 10th Senate Committee of Nanyang Technological University 2025 - Present

[2] Program Faculty Advisor for Actuarial Science Aug 2020 - Present

[3] IFoA exemption recommendation exercise for NBS Actuarial Science graduates 2020 - Present

[4] School Search Committee (Chair) of Tenure-track Position in Actuarial Science Jul 2024 - Present

[5] Division of Banking & Finance School Search Committee (SSC) 2024 - Present

[6] Division of Banking & Finance Undergraduate Teaching Committee Jul 2024 - Present

[7] Division of Banking & Finance Curriculum Review Committee Jul 2024 - Present

[8] Faculty Representative, Early Admissions & Scholarship Exercise (EASE) 5 Dec, 2025

[9] Speaker in Actuarial Science Club Orientation Night 25 Aug, 2025

[10] Faculty Representative, NTU Open House – Discover Business 1 Mar 2025

[11] Speaker in "Nurturing Talent of Tomorrow" event 22 Nov, 2024

[12] Faculty representative, EASE cum launch of Nanyang Global Leaders programmme 28 Nov, 2024

[13] Speaker in sharing session with the Kluang Chong Hwa Independent High School students 20 Nov, 2024

[14] Chair, 2024 NTU-GAIP Insurance Case Competition Organization Committee Feb - Aug, 2024

[15] Organization of Prudential engagement session 2024 27 Mar, 2024

[16] Faculty representative, NBS UPO Open House 2 Mar, 2024

[17] Speaker in sharing session with the VJC students 23 Jan, 2024

[18] Organization of Information session for JC/Poly students at NBS Gaia 20 Jan, 2024

[19] Speaker, CareerSAdvance Seminar 2023 20 Nov, 2023

[20] Instructor, Talent Development Programme SAJC case study 16 Nov, 2023

[21] Presenter, Information Session for University Education and Career in Actuarial Science and Risk Analytics 14 Nov, 2023

[22] Presenter, Actuarial Science awareness event for Anglo-Chinese School (Independent) 4 Oct, 2023

[23] Faculty representative, Actuarial Science awareness event for Hwa Chong Institution 15 Aug 2023

[24] NTU-GAIP Case Competition Committee, Judge and Faculty Advisor Mar - Jun, 2023

[25] Faculty representative, NBS Learning Festival 2023: Create the World You Want

[26] Panel Member, Wee Cho Yaw Future Leaders Award Scholarship Interview 8 May, 2023

[27] Organization of Prudential engagement session in which students meet and talk to Prudential Chief Actuary and other senior management 5 Apr, 2023

[28] Present in the SCOR Inspiring Girls Session to introduce actuarial science 10 Mar, 2023

[29] Host a meeting between SCOR R&D Team with NBS faculty 10 Feb, 2023

[30] Faculty representative for NBS Virtual Open House 11 Feb, 2023

[31] Host a meeting between the IFoA President and CEO with NBS faculty 5 Dec, 2022

[32] Faculty representative in networking night for Actuarial Science (ACS) and Risk Analytics (RA) students and alumni 2 Dec, 2022

[33] Application committee for SOA CAE program 2021-2022

[34] Faculty representative, NBS Admission High Tea (Why NBS?) 14 May, 2022

[35] Faculty representative, NBS UPO Open House Live Chat 28 Feb, 2022

[36] Host the IFoA Annual Accreditation Review Meeting (Virtual) Nov 2021

[37] Faculty Advisor, Quantitative Finance & Actuarial Science Club Aug 2020 - Present

[38] Risk Analytics curriculum revamping committee 2020-2021

[39] NBS Open House 2021 - Specialisation Talk & Virtual Seminar 27 Feb, 2021

[40] Faculty representative for Undergraduate Early Admission Exercise (EASE) virtual session Jan 2021

[41] Host the IFoA Annual Accreditation Review (Virtual) Nov 2020

[42] Faculty representative for NBS Specialisation Talk 2-13 Mar, 2020

[43] Faculty representative for UPO Open House Live Chat on Facebook Live 29 Feb, 2020

[44] Faculty representative for 2020 Early Admissions and Scholarships Exercise (EASE) 7 Jan, 2020

[45] Interviewer, Admissions and Scholarship Exercise 2018-Present

[46] Interview Committee: Masters of Financial Engineering (MFE) program recruiting 2018-2020

[47] Host the IFoA Annual Accreditation Review Meeting Nov 2019

[48] Host the Casualty Actuary Society (CAS) meeting with NBS faculties 25 Oct, 2019

[49] Judge of Risk Management Challenge 2018-2021

[50] Judge of Actuarial Management Challenge 2018-2021

[51] Host the IFoA Annual Accreditation Review Meeting Nov 2018

TEACHING

Nanyang Technological University, Singapore

		Course	Program	Latest Evaluation
•	BA3202	Actuarial Statistics Semester 2 (AY17/18 - Present)	Undergraduate	4.84/5
•	BR3204/3219	Property and Liability Insurance Semester 2 (AY17/18 - Present)	Undergraduate	4.8/5
•	BF3207/3210	Alternative Investments Semester 1&2 (AY20/21 - Present)	Undergraduate	4.94/5
•	FF6129	Sustainability: Corporate Strategy & Risk Management Trimester 3 (AY24/25 - Present)	MSc of Finance	4.77/5
•	BM6603	Climate Science, Climate Risk Assessment, and Sustainable Finance Semester 3 (AY22/23 - Present)	MBA	4.6/5
•	FE8513	Financial Time Series Analysis Mini-Term 3 (AY18/19 - AY19/20)	MSc of Financial Engineering	4.7/5
•	FE8514	Advanced Statistical Modeling Mini-Term 4 (AY18/19 - AY19/20)	MSc of Financial Engineering	4.7/5

Nankai University, China

- Topics in Actuarial Science, Masters of Actuarial Science — Spring 2017
- Asset-Liability Management, Masters of Actuarial Science — Spring 2016, 2017

University of Waterloo, Canada

- ACTSC 231 Mathematics of Finance, Undergraduate — Spring 2015

MISCELLANEOUS

- Date of Birth: September, 1990.
- *Programming Languages:* Matlab, R, LaTeX, Python, SQL, Stata, SAS, VBA.
- *Hobbies:* Traditional Chinese Calligraphy · History · Running · Singing · Dancing