# Lu Yang

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## Education

**Ph.D.** - Statistics
University of Wisconsin-Madison, Madison, WI, USA — September 2012 - August 2017
Advisors: Professor Edward W. Frees and Professor Zhengjun Zhang
Thesis Topic: Copula Regression with Discrete Outcomes

**B.S.** - Mathematics and Applied Mathematics
Zhejiang University, Hangzhou, China — September 2008 - June 2012

## Academic Positions

**Director of the Lynn Y. S. Lin Consulting Center** — June 2024 - Present

**Assistant Professor** - Statistics — October 2020 - Present
School of Statistics, University of Minnesota, Minneapolis, USA

**Assistant Professor** - Actuarial Science and Mathematical Finance — August 2017 - October 2020
Amsterdam School of Economics, University of Amsterdam, Amsterdam, The Netherlands

## Research Interests

Multivariate analysis

Regression model diagnostics

Nonparametric methods

Insurance analytics

## Publications and Preprints

1. **Yang, L.**, Shi, P., Huang, S. (2024) A Copula Model for Marked Point Process with A Terminal Event: An Application in Dynamic Prediction of Insurance Claims, *Annals of Applied Statistics*, Vol. 18, No. 4, pp. 2679-2704.

2. **Yang, L.** (2024) Diagnostics for Regression Models with Semicontinuous Outcomes, *Biometrics*, Vol. 80, No. 1.

3. **Yang, L.** (2024) Double Probability Integral Transform Residuals for Regression Models with Discrete Outcomes, *Journal of Computational and Graphical Statistics*, Vol. 33, No. 3, pp. 787–803.

4. **Yang, L.**, Czado, C. (2022) Two-Part D-Vine Copula Models for Longitudinal Insurance Claim Data, *Scandinavian Journal of Statistics*, Vol. 49, No. 4, pp. 1534-1561.

5. **Yang, L.** (2022) Nonparametric Copula Estimation for Mixed Insurance Claim Data, *Journal of Business & Economic Statistics*, Vol. 40, No. 2, pp. 537-546.

6. **Yang, L.** (2021) Assessment of Regression Models with Discrete Outcomes Using Quasi-Empirical Residual Distribution Functions, *Journal of Computational and Graphical Statistics*, Vol. 30, No. 4, pp. 1019-1035.

7. **Yang, L.**, Frees, E.W., Zhang, Z. (2020) Nonparametric Estimation of Copula Regression Models with Discrete Outcomes, *Journal of the American Statistical Association*, Vol. 115, No. 530, pp. 707–720.

8. **Yang, L.**, Shi, P. (2019) Multiperil Rate Making for Property Insurance Using Longitudinal Data, *Journal of the Royal Statistical Society: Series A (Statistics in Society)*, Vol. 182, No. 2, pp. 647-668.

9. Shi, P., **Yang, L.** (2018) Pair Copula Constructions for Insurance Experience Rating, *Journal of the American Statistical Association*,Vol. 113, No. 521, pp. 122-133.

10. Frees, E.W., Lee, G., **Yang, L.** (2016) Multivariate Frequency-Severity Regression Models in Insurance, *Risks*, Vol. 4, p. 4.

## Working Papers

1. **Yang, L.**, Genest, C., Nešlehová, J. (2024) A Goodness-of-Fit Test for Regression Models with Discrete Outcomes, under revision.

2. Lee, J, **Yang, L.**, Eck, D. (2025) `assessor`: Assessment Tools for Regression Models with Non-continuous Outcomes, in preparation.

3. **Yang, L.**, Jones, G. (2025) A New Measure of Dependence between Multinomial and Continuous Random Variables, in preparation.

4. Resin, J., Gneiting, T., **Yang, L.** (2025) Notions of Calibration – Nominal Data Meet Real-Valued Outcomes, in preparation.

## Software

1. `assessor`: An `R` package with assessment tools for regression models with discrete and semicontinuous outcomes https://jhlee1408.github.io/assessor/

## Professional Activities

Invited Presentations

**A Copula Model for Marked Point Process with A Terminal Event: An Application in Dynamic Prediction of Insurance Claims**
Seminar, Department of Accountancy, Finance and Insurance, KU Leuven, Belgium March 2025

**A Copula Model for Marked Point Process with A Terminal Event: An Application in Dynamic Prediction of Insurance Claims**
Seminar, School of Economics, University of Amsterdam, The Netherlands March 2025

**New Residuals for Regression Models with Noncontinuous Outcomes**
Seminar, Heidelberg Institute for Theoretical Studies, Heidelberg Germany February 2025

**New Residuals for Regression Models with Noncontinuous Outcomes**
One World Actuarial Research Seminar, virtual December 2024

**A Copula Model for Marked Point Process with A Terminal Event: An Application in Dynamic Prediction of Insurance Claims**
Sixth ICSA-Canada Chapter Symposium, Niagara Falls, Canada June 2024

**Dynamic Prediction of Outstanding Insurance Claims Using Joint Models for Longitudinal and Survival Outcomes**
Lecture of Statistics, School of Statistics, Renmin University, China, virtual December 2023

**New Residuals for Regression Models with Discrete Outcomes Based on Double Probability Integral Transform**
Invited session, Joint Statistical Meetings, Toronto, Canada August 2023

**Dynamic Prediction of Outstanding Insurance Claims Using Joint Models for Longitudinal and Survival Outcomes**
Young Scholars Forum on Mathematics, Zhejiang University, China June 2023

**New Residuals for Regression Models with Noncontinuous Outcomes**
Colloquium, Department of Statistics and Probability, Michigan State University, USA April 2023

**Dynamic Prediction of Outstanding Insurance Claims Using Joint Models for Longitudinal and Survival Outcomes**
Actuarial Science Seminar, Department of Mathematics, University of Connecticut, USA, virtual November 2022

**Dynamic Prediction of Outstanding Insurance Claims Using Joint Models for Longitudinal and Survival Outcomes**
Extreme Value Theory and Quantitative Risk Management (EVT & QRM) Workshop, Shanghai Center of Mathematical Sciences and Fudan University School of Data Science, China, virtual August 2022

**Dynamic Prediction of Outstanding Insurance Claims Using Joint Models for Longitudinal and Survival Outcomes**
MCFAM Seminar, School of Mathematics, University of Minnesota, USA, virtual April 2022

**Dynamic Prediction of Outstanding Insurance Claims Using Joint Models for Longitudinal and Survival Outcomes**
Seminar, Department of Risk Management & Insurance, Georgia State University, USA, virtual March 2022

**Dependence Modeling of Mixed Insurance Claim Data**
Seminar, Department of Mathematics and Statistics, McGill University, Canada, virtual April 2021

**Diagnostics for Regression Models with Discrete Outcomes**
Seminar, School of Statistics, University of Minnesota, USA February 2020

**Dependence Modeling of Mixed Insurance Claim Data**
Seminar, Department of Statistics, The Ohio State University, USA February 2020

**Two-Part D-Vine Copula Models for Longitudinal Insurance Claim Data**
Seminar, Department of Mathematics, University of Illinois, USA January 2020

**Diagnostics for Regression Models with Discrete Outcomes**
Seminar, Department of Statistics and Actuarial Science, University of Waterloo, Canada January 2020

**Diagnostics for Regression Models with Discrete Outcomes**
Seminar, Department of Statistics, Purdue University, USA January 2020

**Diagnostics for Regression Models with Discrete Outcomes**
Seminar, Department of Statistics, University of Illinois, USA January 2020

**Nonparametric Copula Estimation for Mixed Insurance Claim Data**
CFE-CMStatistics 2019, London, UK December 2019

**Diagnostics for Regression Models with Discrete Outcomes**
Seminar, Department of Statistics, University of British Columbia, Canada December 2019

**Vine Copulas for Discrete and Mixed Data**
Invited lecture, FWO (Research Foundation - Flanders) Research Network on Asymptotic Theory of Multivariate Statistics, Hasselt University, Belgium November 2019

**Multi-Peril Ratemaking for Property Insurance Using Longitudinal Data**
Joint Statistical Meetings, Denver, CO, USA July 2019

**Two-Part D-Vine Copula Models for Longitudinal Insurance Claim Data**
Workshop on Vine Copulas and their Applications, Munich, Germany July 2019

**Diagnostics for Regression Models with Discrete Outcomes**
Seminar, Department of Statistics, The Ohio State University, USA April 2019

**Two-Part D-Vine Copula Models for Longitudinal Insurance Claim Data**
Seminar, Department of Risk and Insurance, University of Wisconsin-Madison, USA March 2019

**Multivariate Discrete Outcomes: from Marginal Model Diagnostics to Nonparametric Copula Estimation**
Seminar, Department of Statistical Sciences, University of Toronto, Canada February 2019

**Multivariate Discrete Outcomes: from Marginal Model Diagnostics to Nonparametric Copula Estimation**
Seminar, Department of Statistics and Actuarial Science, University of Waterloo, Canada
January 2019

**Two-Part D-Vine Copula Models for Insurance Claim Data**
CFE-CMStatistics 2018, Pisa, Italy December 2018

**Nonparametric Estimation of Copula Regression Models with Discrete Outcomes**
Statistics in Insurance Workshop, Madison, WI, USA October 2018

**Copula Regression with Discrete Outcomes**
Seminar on Statistics and Risk Management, Chair of Mathematical Statistics, Technical University of Munich, Germany May 2018

**Multivariate Frequency-Severity Regression Models in Insurance**
CFE-CMStatistics 2017, London, UK December 2017

**A "New" Method to Model Data with Outliers**
Internship final presentation, The Travelers Companies, St Paul, MN, USA August 2015

Contributed Presentations

**A Copula Model for Marked Point Process with A Terminal Event: An Application in Dynamic Prediction of Insurance Claims**
27th International Congress on Insurance: Mathematics and Economics, Chicago, IL, USA
July 2024

**A Copula Model for Marked Point Process with A Terminal Event: An Application in Dynamic Prediction of Insurance Claims**
12th Conference in Actuarial Science & Finance on Samos, Samos, Greece May 2024

**Diagnostics for Regression Models with Mixed Insurance Claim Data**
54th Actuarial Research Conference, Indianapolis, IN, USA August 2019

**Diagnostics for Regression Models with Mixed Insurance Claim Data**
23rd International Congress on Insurance: Mathematics and Economics, Munich, Germany
July 2019

**Multi-Peril Ratemaking for Property Insurance Using Longitudinal Data**
4th European Actuarial Journal Conference, Leuven, Belgium September 2018

**Nonparametric Estimation of Copulas with Discrete Outcomes**
10th Conference in Actuarial Science & Finance on Samos, Samos, Greece June 2018

**Copula Regression with Discrete Outcomes** 51st Actuarial Research Conference, Minneapolis, MN, USA July 2016

# Grants

**National Science Foundation DMS-2210712**, sole PI 07/01/2022 - 06/30/2025

Assessment of Regression Models with Noncontinuous Outcomes

Total cost: $203,498

**AMS-Simons Travel Grant** 2021 - 2023

Providing selected early-career mathematicians with $2,500 per year for two years to be used for research-related travel

# Selected Awards and Honors

**Tenure-Track Single Semester Leave**, College of Liberal Arts, University of Minnesota 2023

**Simons CRM Scholar** 2018
Selected by the scholar-in-residence program of the Centre de recherches mathématiques (in Montreal, Canada) for research visit with financial support

**Presentation Prize**, 10th Conference in Actuarial Science & Finance on Samos 2018

**Presentation Prize**, Actuarial Research Conference 2016

**Student Travel Award**, Actuarial Research Conference 2016

# Research Stays

Heidelberg Institute for Theoretical Studies, Heidelberg, Germany (3 months, with Tilmann Gneiting)
February 2025 - April 2025

McGill University, Montreal, Canada (3 months, with Christian Genest and Johanna Nešlehová)
February 2019 - April 2019

University of Wisconsin-Madison, Madison, US (1 week, with Peng Shi) March 2019

Technical University of Munich, Munich, Germany (1 week, with Claudia Czado) May 2018

# Teaching Experience

**School of Statistics, University of Minnesota**

- STAT 8051: Advanced Regression Techniques Fall 2022, Fall 2023, Fall 2024
  Core course for Ph.D. and master's students in statistics.
- STAT 5102: Theory of Statistics II Fall 2024
- STAT 5021: Statistiscal Analysis
  Spring 2021, Fall 2021, Spring 2022, Spring 2023, Fall 2023, Spring 2024
  Provides an intensive introduction to statistical methods for graduate students needing statistics as a research technique.

**Amsterdam School of Economics, University of Amsterdam**

Teaching Certificate
University Teaching Qualification (BKO), Dutch accredited teaching certificate for higher education March 2018

Lecturer and Course Coordinator

- Introduction Data Science: Data Preprocessing (BSc in Actuarial Science and Econometrics, 1st year) 2019
  Developed the new course for students with data science specialization
- Risk Management for Insurers and Pensions (MSc in Actuarial Science and Mathematical Finance) 2017, 2018, 2019

Teaching Assistant, led tutorials and computer lab sessions

- Life Insurance Mathematics (BSc in Actuarial Science, 2nd year) 2017, 2018, 2019, 2020
- Introduction Actuarial Science and OR (BSc in Actuarial Science, 1st year) 2018, 2019
- Empirical Project (BSc in Actuarial Science, 2nd year) 2018, 2019

**University of Wisconsin-Madison**

Teaching Assistant, led discussions, held office hours, graded homework, exams and projects. Ranked top ten percent in TA evaluation.
Department of Statistics, University of Wisconsin-Madison

- STAT 349 (Intermediate, Undergraduate): Introduction to Time Series Spring 2015
- STAT 571 (Graduate): Statistical Methods for Bioscience Fall 2014
- STAT 310 (Intermediate, Undergraduate): Introduction to Probability and Mathematical Statistics Fall 2013
- STAT 371 (Introductory, Undergraduate): Introductory Applied Statistics for the Life Sciences Spring 2013
- STAT 301 (Introductory, Undergraduate): Intro-Statistical Methods Fall 2012

Head TA, supervised and helped other TAs to improve and ensure teaching excellence
Department of Statistics, University of Wisconsin-Madison Fall 2013, Spring 2015

Project Assistant
Risk and Insurance Department, University of Wisconsin-Madison Fall 2015 - Spring 2017

- Built website to provide additional learning materials such as data and code for *Predictive Modeling Applications in Actuarial Science*, a two volume series written for practicing actuaries for continuing education purpose.
- Helped build the materials for the course *Loss Model*. Created multimodal presentations such as interactive visualizations and built `R` tutorials.

# Service and Advising

**Referee**
Journal of the American Statistical Association, Journal of the Royal Statistical Society: Series B, Journal of Computational and Graphical Statistics, Journal of Business & Economic Statistics, Biometrics, Journal of Machine Learning Research, Canadian Journal of Statistics, Statistica Sinica, Australian & New Zealand Journal of Statistics, Journal of the Royal Statistical Society: Series C (Applied Statistics), Journal of Multivariate Analysis, Journal of Nonparametric Statistics, Management Science, Insurance: Mathematics and Economics, Risk Analysis, European Actuarial Journal, Variance

**Conference organization**

- Co-organizer and chair, topic contributed papers session "Emerging Methods and Applications in Insurance Data Science"
  Joint Statistical Meetings, Washington, DC, USA — August 2022

**Thesis Supervision**

School of Statistics, University of Minnesota

- Ziyu Ge, Undergraduate Research Opportunities Program — 2024
- Zeyu Li, master's thesis — 2024
- Yining Guo, master's thesis — 2024
- Howard Wen, master's thesis — 2024
- You Zu, master's thesis — 2023
- Haoyu Chen, master's thesis — 2021

Amsterdam School of Economics, University of Amsterdam

Supervised 10 master's theses on various topics in insurance and finance — 2018, 2019, 2020
Supervised 9 bachelor's theses on various topics in insurance and finance — 2019, 2020

**Dissertation Committee**

- Matthew Snodgress, Committee Member, Psychology Ph.D., University of Minnesota — 2024
- Pengyan Sun, Committee Member, Statistics M.S., University of Minnesota — 2024
- Zhiren Zheng, Committee Member, Statistics M.S., University of Minnesota — 2024
- Ruiqi Wang, Committee Member, Statistics M.S., University of Minnesota — 2024
- Xinyang Li, Committee Member, Statistics M.S., University of Minnesota — 2024
- Zhiyuan Lin, Committee Member, Statistics M.S., University of Minnesota — 2024
- Muuzaani Nkhoma, Committee Member, Statistics M.S., University of Minnesota — 2024
- Kelly Duffy, Committee Member, Statistics M.S., University of Minnesota — 2023
- Marten Thompson, Committee Member, Statistics Ph.D., University of Minnesota — 2023
- Yuan Lu, Committee Member, Statistics M.S., University of Minnesota — 2023
- Matthew Snodgress, Committee Member, Statistics M.S., University of Minnesota — 2023
- Robert Verschuren, Committee Member, Actuarial Science & Mathematical Finance Ph.D., University of Amsterdam — 2022
- Di Yang, Committee Member, Transportation Planning and Engineering Ph.D., New York University — 2022
- Xiaofei Lyu, Committee Member, Statistics M.S., University of Minnesota — 2021

**Internal Service Activities**

- Director, IRSA Statistical Consulting Center, School of Statistics — 2024 - Present
- Chair, PhD exam committee, School of Statistics — 2024 - 2025
- Member, PhD exam committee, School of Statistics — 2022 - Present
- School seminars committee, School of Statistics — 2023 - 2024
- Member, CLA Assembly, College of Liberal Arts — 2022 - 2024
- Member, Awards committee, School of Statistics — 2021 - 2022
- Member, Computing committee, School of Statistics — 2020 - 2022

## Industry Experience

**Advanced Analytics Intern**
The Travelers Companies, St Paul, MN, USA — June 2015 - August 2015

*Last update: May 8, 2025*