

Michael Boyuan Zhu, ASA

Department of Statistics and Actuarial Science
University of Waterloo

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Education

- Ph.D. – Actuarial Science**, University of Waterloo 2025
- Supervisor: Prof. Mario Ghossoub
 - Thesis: Efficiency and Equilibria in Centralized and Decentralized Insurance Markets
- Master of Mathematics – Actuarial Science**, University of Waterloo 2020
- Supervisor: Prof. Mario Ghossoub
 - Thesis: Cost Efficient Contingent Claims with Choquet Pricing
 - Cumulative average: 96%
- Honours Bachelor of Mathematics**, University of Waterloo 2018
- Mathematical Finance, Computer Science Minor
 - Graduation with Distinction
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Professional Designation

ASA: Associate of the Society of Actuaries

Research Interests

Actuarial science, quantitative risk management,
game theory, ambiguity and risk uncertainty, behavioral finance

Publications and Manuscripts

Peer-reviewed journal articles

1. **Pareto-Optimal Peer-to-Peer Risk Sharing with Robust Distortion Risk Measures** (with Mario Ghossoub, Wing Fung Chong). *ASTIN Bulletin*, forthcoming. [arXiv]
2. **Risk-Constrained Portfolio Choice under Rank-Dependent Utility** (with Mario Ghossoub). *Finance and Stochastics*, 29(2):399-442, 2025. [↗]
3. **Stackelberg Equilibria with Multiple Policyholders** (with Mario Ghossoub). *Insurance: Mathematics and Economics*, 116(1):189-201, 2024. [↗]
4. **Pareto-Optimal Insurance with an Upper Limit on the Insurer's Exposure** (with Oma Coke, Mario Ghossoub). *Scandinavian Actuarial Journal*, 2024(3):227-251, 2024. [↗]
5. **Equilibria and Efficiency in a Reinsurance Market** (with Tim Boonen, Mario Ghossoub). *Insurance: Mathematics and Economics*, 113(1):24-49, 2023. [↗]

Pre-publication manuscripts and working papers

1. **Efficiency in Pure-Exchange Economies with Risk-Averse Monetary Utilities** (with Mario Ghossoub). *Submitted*. [arXiv]
 2. **Loss Aversion for Decision under Risk** (with Mario Ghossoub). *Working paper*.
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Academic Presentations

1. **Efficiency and Equilibria in (Re)Insurance Markets** – Quantact Actuarial and Financial Mathematics Research Seminar (Jan. 2025)
 2. **Pareto-Efficient Contracts in Centralized vs. Decentralized Insurance Markets, with an Application to Flood Risk** – 27th International Congress on Insurance: Mathematics and Economics (Jul. 2024)
 3. **Equilibria and Efficiency in a Reinsurance Market** – 26th International Congress on Insurance: Mathematics and Economics (Jul. 2023)
 4. **Insurance with Heterogeneous Beliefs: A Sequential Game Model** – Waterloo 3rd Student Conference in Statistics, Actuarial Science, and Finance (Oct. 2022)
 5. **Risk Sharing with Heterogeneous Beliefs** – University of Amsterdam (Jun. 2022)
 6. **Risk-Constrained Portfolio Choice via Quantiles** – Waterloo 2nd Student Conference in Statistics, Actuarial Science, and Finance (Nov. 2021), 56th Actuarial Research Conference (Aug. 2021), 24th International Congress on Insurance: Mathematics and Economics (Jul. 2021)
 7. **Cost-Efficient Contingent Claims with Choquet Pricing** – Canadian Operational Research Society Annual Conference (Jun. 2021), University of Waterloo Statistics and Actuarial Science Presentation Day (Feb. 2021)
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Professional Service

- Conference Co-Chair** – 4th WSSAF October 27-28, 2023
- One of two student organizers in charge of the 4th Waterloo Student Conference in Statistics, Actuarial Science and Finance. Duties included contacting external speakers, managing volunteers, event logistics, etc.
- Research Mentor** – Women in Mathematics (WiM) Directed Reading Program January – April 2023
- Mentored a female undergraduate student from the Faculty of Mathematics as part of the WiM Directed Reading Program. Focused on the topic of economic equilibria from mathematical economics.
- Conference Volunteer, Session Chair** – 2nd, 3rd WSSAF October 2021, 2022
- Assisted with the 2nd and 3rd editions of the Waterloo Student Conference in Statistics, Actuarial Science and Finance. Reviewed abstracts and served as session chair.

Peer-Review Service

- *ASTIN Bulletin*, *North American Actuarial Journal*, *Scandinavian Actuarial Journal*.
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Teaching Experience

- Sessional Instructor**, University of Waterloo
- ACTSC 446/846 – Mathematics of Financial Markets Fall 2023
- Teaching Assistant**, University of Waterloo
- ACTSC 971 – Finance 2 2021, 2024

- ACTSC 446/846 – Mathematics of Financial Markets 2020, 2021, 2023
 - ACTSC 445/845 – Quantitative Enterprise Risk Management 2021
 - ACTSC 631 – Financial Mathematics III 2020, 2021, 2022, 2023
 - ACTSC 633 – Actuarial Risk Management 2022
 - ACTSC 634 – Quantitative Risk Management 2020, 2021, 2023
 - ACTSC 635 – Professional Communications in Actuarial Science 2022
 - ACTSC 372 – Corporate Finance 2021, 2022
 - STAT 333 – Applied Probability 2019, 2020
 - STAT 231 – Statistics 2019
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Selected Honors and Awards

- James C. Hickman Scholar – SOA 2022-2025
- Ontario Graduate Scholarship 2022-2025
- D.A. Sprott Entrance Award – University of Waterloo 2020
- Actuarial Science Doctoral Entrance Award – University of Waterloo 2020
- NSERC Undergraduate Student Research Award 2016

Last updated: May 2025