Michael Boyuan Zhu

Department of Statistics and Actuarial Science
University of Waterloo
Mathematics 3, 200 University Avenue West
Waterloo, ON, Canada N2L 3G1

E-mail | mbzhu@uwaterloo.ca
Office | M3 Room 4132
Website | https://michaelzhu.ca

Education

Ph.D. Candidate – Actuarial Science, University of Waterloo — September 2020 – Present

- Supervisor: Dr. Mario Ghossoub

Master of Mathematics – Actuarial Science, University of Waterloo — September 2019 – September 2020

- Supervisor: Dr. Mario Ghossoub
- Completed Thesis: Cost Efficient Contingent Claims with Choquet Pricing
- Cumulative average: 96%

Exchange Student – Computer Science, ETH Zürich — September 2016 – February 2017

Honours Bachelor of Mathematics, University of Waterloo — September 2013 – December 2018

- Mathematical Finance, Computer Science Minor
- Graduation with Distinction

Research Interests

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

Publications and Manuscripts

Peer-reviewed journal articles

1. **Risk-Constrained Portfolio Choice via Quantiles** (with Mario Ghossoub). *Finance and Stochastics*, forthcoming. [SSRN]
2. **Stackelberg Equilibria with Multiple Policyholders** (with Mario Ghossoub). *Insurance: Mathematics and Economics*, 116(1):189-201, 2024. [↗]
3. **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. [↗]
4. **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. **Pareto-Optimal Peer-to-Peer Risk Sharing with Robust Distortion Risk Measures** (with Mario Ghossoub, Wing Fung Chong). *Submitted.* [arXiv]
3. **Loss Aversion for Decision under Risk** (with Mario Ghossoub). *Working paper.*

Academic Presentations

1. **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)
2. **Equilibria and Efficiency in a Reinsurance Market** – 26th International Congress on Insurance: Mathematics and Economics (Jul. 2023)
3. **Insurance with Heterogeneous Beliefs: A Sequential Game Model** – Waterloo 3rd Student Conference in Statistics, Actuarial Science, and Finance (Oct. 2022)
4. **Risk Sharing with Heterogeneous Beliefs** – University of Amsterdam (Jun. 2022)
5. **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)
6. **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)

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.

Teaching Experience

Sessional Instructor, University of Waterloo

- ACTSC 446/846 – Introduction into Financial Mathematics — Fall 2023

Teaching Assistant, University of Waterloo

- ACTSC 971 – Finance 2 — 2021, 2024
- ACTSC 446/846 – Introduction into Financial Mathematics — 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

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
- Top 350 (of 4275) in the Putnam Mathematical Competition 2015
- Placed 30th nationally in the Canadian Mathematical Olympiad 2012

Work Experience

Undergraduate Research Assistant – Pure Mathematics January – April 2016
University of Waterloo – Waterloo, ON

Software Engineer Intern May – August 2015
Wish – San Francisco, CA

Application Analyst April – August 2014
National Bank Financial – Toronto, ON

Other Skills

Technical	Programming: Python, C/C++, Java, Shell Scripting, Scheme/Racket, HTML/Javascript Data/statistics: MATLAB, R, Maple, Microsoft Excel Tools: LaTeX, Unix, Git, MongoDB, Hive
Actuarial	Exams passed: P, FM, IFM, STAM, SRM, FAM-L, PA

Last updated: Sept. 2024